THEODORE M. PORTER

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Preface and Acknowledgments

THIS BOOK FOLLOWS the life of a singular individual, one who shaped in many ways the form and the ethic of twentieth-century statistical methods. Given the immense role of statistics in modern science and modern life, Karl Pearson must be counted among the leading scientific figures of the contemporary era. I explore the connections of intellectual activities ranging from romantic literature, socialism, cultural history, and feminist theories of the origin of society to ether physics, scientific method, and graphical geometry, concluding with the statistical impulse that seized him at about the age of thirty-five. His statistical work provides much of the raison d'être for this study but I devote only about a quarter of the book to it. While I try to write precisely enough that statisticians will be able to recognize mathematical forms where mathematics is at issue, the book has no equations and certainly does not pretend to deal comprehensively with Pearson's career as a mathematical statistician. I am interested here primarily in the moral and intellectual presumptions of the statistical life, the ways Pearson helped to form, and yet dissented from, a new, more rigorously quantitative style of science that came to prevail in a variety of biological, social, and applied fields around the beginning of the twentieth century. I have also seized the opportunity to link scientific experience to humanistic conceptions and personal life, and to ponder in conclusion what ideals of individuality are encouraged by the public culture of modern science.

My own interest in this project and in some of the broad issues I raise—topics that might well be taken up in a preface—I have discussed in a somewhat reflexive epilogue. Readers who would prefer to be informed of methodological and stylistic choices and to examine conclusions before they confront the historical material that supports them might want to look at my final chapter first, as well as last. I have avoided the straightforward, somewhat stylized form of the standard biography in hopes of doing justice to an extraordinary life and to the political, cultural, literary, and scientific milieu in which it was formed. I deliberately do not follow the theories of any particular psychological school, but am of course quite aware that I depend on the interpretive insights of a post-Freudian tradition.

Pearson's letters and papers, which survive in unusual abundance, contain many traces of the reasons for their preservation and availability to scholars. I have Karl Pearson himself, in part, to thank for that, but also his statistician son Egon Pearson, and especially his daughter, Helga Hacker, neither of whom was still alive when I began this research. I have made

frequent use of the Pearson Papers at University College, London, with much friendly assistance from archivists and staff. I gratefully acknowledge the Manuscripts Division for permission to quote from letters and other documents. I would mention in particular Gillian Furlong and Susan Stead, who were there from the beginning to the end of the project. I gratefully acknowledge the financial support of the National Science Foundation, grants SBER94-12396 and SES00-80104, the Max Planck Institute for History of Science in Berlin, the Ecole des Hautes Etudes en Sciences Sociales in Paris, the University of California Humanities Research Institute in Irvine, and the Academic Senate of UCLA.

I would like on this occasion to express appreciation for some teachers from my youth. At Chimacum School on the Olympic Peninsula in Washington I will single out Bernie Mueller, who made history engaging, and Carolyn Mueller and Susan Phillips, who cared about writing and literature. As a Stanford undergraduate I appreciated especially the teaching and support of Harold Bacon in mathematics, and Paul Robinson in intellectual history. My mathematical education owed much also to my father, who taught me at home and at school, and whose death a few years ago from leukemia was a painful loss. I thank him and my mother, above all for a home full of love.

Many colleagues and students contributed to this work by listening to presentations, asking questions, and discussing the project. For comments on chapters, I thank Ken Alder, Lorraine Daston, Ellen DuBois, Anne Mellor, Peter Reill, Dorothy Ross, Stephen Stigler, Mary Terrall, and Norton Wise. Dan Eshet, Minghui Hu, and Gabriel Wolfenstein provided able research assistance. I owe special thanks to Mary Morgan and Charles Baden Fuller, who gave me a place to stay as well as their sympathetic, scintillating company repeatedly, often for several weeks, whenever I came to London to read in the archives. Finally, I offer these few words of written appreciation to Diane Campbell and David Campbell Porter, who have put up with Pearson for eight years, and with my perhaps unreasonable commitment to work of this kind for still longer.

Theodore M. Porter
March, 2003

CHAPTER ONE

Introduction:

AN IMPROBABLE PERSONAGE

> When I get my hand in sufficiently I think I will write "Karl Pearson, a Tragedy." Can anything be done to rescue you from your professorship?
>
> —George Bernard Shaw to Karl Pearson, 20 June 1893 (Pearson Papers 627)

Beginning in 1892, when he took up statistics as his scientific vocation, Karl Pearson devoted himself relentlessly to a project of almost universal quantification. This work, the invention of a mathematical field of statistics, defined one of the landmark transitions in the history of the sciences, or indeed of public rationality. Until then he had been a thoroughly restless intellectual, as involved in politics, literature, and history as in science. These studies and experiences set up his wide-ranging career as a quantifier, and at the same time created conditions for enduring doubts about this mission, to which he thereafter dedicated his career, and about the form of society it helped to fashion. Having sought through philosophy, history, marital partnership, scientific method, and statistics to discipline and socialize the egoistic self, he came increasingly to fear that the modern project of specialized science would fragment selfhood and suppress individuality.

When Pearson was twenty-three, in 1880, the autobiographical Arthur of his novel *The New Werther* effervesced to his lover, Ethel: "What meaning has the word 'kiss' to him who does not know that through the electric contact of a moment two fiery souls may feel united for an eternity? What meaning has the word 'life' for him who has only existed in order to hand down his name to posterity in the footnotes of a classic or as inventor of an integral?" Half a century later, as his wife (he thought) lay dying, he recalled his grand scientific ambitions and pronounced his career a failure. "Twenty years hence a curve or a symbol will be called 'Pearson's' & nothing more remembered of the toil of the years." In this his most tragic voice he ascended to prophecy, for this "Pearson" has survived primarily as the name of a correlation coefficient. Forgotten is not only a complex individual, but also the historical mood, the ethical and political aspirations,

the literary and philosophical sources, and the scientific vision that brought into being this technical art, which in the twentieth century would reconfigure scientific and social reason.[1]

As revolutions devour their children, so science has meant the compression of memory. Artists and authors are at least memorialized by their works, which may then be linked to the circumstances of their lives and times. The sciences reduce even their most eminent men and women to a few discrete discoveries, a single dimension. The legitimacy, perhaps even necessity, of forgetting is often seen as concomitant to scientific progress, and statistics in the twentieth century has been integral to this aspect of the scientific identity. Pearson, who was unfailingly attentive to the past, recognized this characteristic of the institutions to which he devoted his life, and lamented it. In later life he devoted much attention to the history of his field. Beginning in his youth he wrote a series of more-or-less disguised or fictionalized autobiographies, stories of a dissatisfied man with grand ambitions, later the apostle of a new faith. He preserved an immense fund of documents, whether flattering or not, among the most extraordinary of which is the letter just mentioned, addressed to his sister-in-law, Elisabeth Cobb. In it he summed up his career and his marriage, both as tragic failures. *"Please destroy,"* it begins, followed by a salutation: "My dear Bessie, I want you when you have read this to destroy this at once. I should not like it to come by accident into any other person's hands and you must let me know that you have destroyed it." Below his signature he reiterated, "As I have said, destroy at once." But she never had the opportunity. At the top of the last page, in thinner script, we find: "Never sent. *K. P.*"

From youth on, Pearson's acquaintances often characterized him as cold, emotionless, and rationalistic. In view of his fierce intellectuality and disposition to theorize about everything from religious faith to sexual love, it was a pardonable misperception. Yet he cultivated also—and he wanted the world to know—a different self, one that pondered deeply and suffered, living a life that he alternately imagined as tragic and as triumphant, but that in any case was formed against a background of fateful social and intellectual change. Most of the time he was self-consciously in revolt against the dominant tendencies of his age, yet in retrospect he has seemed often to epitomize some of its less attractive features, especially by his faith in eugenics. An opponent of all compartmentalization, he was a strong advocate of cultural history, which for him was made up of folklore, religion, economy, labor, art, and science, of emotion and reason, none separable from the others. He saw his own life in these terms and deliber-

[1] "Loki" [Karl Pearson], *The New Werther,* 4; KP to Elisabeth Cobb (unsent), 2 April 1927, Pearson Papers 9/6.

ately left behind its traces, from which his younger daughter, Helga, later gathered up, organized, and annotated a vast collection of letters and other documents. Through these papers his intense commitments and wide-ranging intellectual ambitions can be reconstructed, and with them, some of the richness of his connections to his age. We are reminded that rationality, even in its guise as calculation, does not reduce to scientific and administrative routines. In Pearson's life we experience it in a scene of personal cultivation and social struggle, where it has inspired the fiercest of passions.

Pearson's research interests were almost bewilderingly disparate. He was sometimes proud of the range of his scholarly activities, but he also worried of falling into dilettantism. He wanted badly to believe that there was some coherence to it all, or at least to the trajectory of his development. For contemporary humanistic scholarship, which adores fragmentation and is skeptical of unitary "metanarratives," his self-conception must appear largely as wishful thinking. Indeed, no life achieves full coherence, and his centrifugal tendencies were stronger than most. Yet Pearson was right. My aim here is to examine the ways that it all holds together—how, for example, the author of an unsuccessful "nineteenth-century passion play" left his imprint on the philosophy of scientific method and even on statistics.

After trying out a sequence of possible careers and displaying vast iconoclastic ambition in each, Pearson made his mark in what seems one of the more mundane areas of modern life. He endeavored to provide appropriate tools of measurement and calculation for the quantitative analysis of social and scientific problems. This statistical project has been a curious and paradoxical one. It has brought forth many prophets and missionaries—calling for a great reformation of scientific or practical life, and working to reshape a discipline or a professional practice—but no saints. It has never been personified, at least not to a larger public. Pearson himself preached impersonally on behalf of "Saint Biometrika," and in his gloomy letter to Cobb he explained that his ambition had been to establish "a new tool in science which would give certainty where all was obscurity and hypothesis before." It seemed a thankless task. "I have made many enemies and few friends in the process for I was upsetting old idols and endeavouring to replace them by new gods whom scientists of the old training would not accept."[2]

For this unrelenting controversialist, statistics meant battles unceasing against numberless opponents for methods that, as he thought, must in the end prevail because they were right, and because the future would

[2] KP to Florence Joy Weldon, 19 Oct. 1906, Pearson Papers 266/8; also KP to Cobb (see previous note).

require them. He also made many enemies from within the camp of statistics, most notably the equally acerbic Ronald Aylmer Fisher, who, by the brilliance of his work and the scorn of his commentaries, contributed to the dimming of Pearson's reputation among his disciplinary heirs.[3] Few outside the field have recognized the extent of disagreement and controversy within it, and so few have been able to appreciate the richness and contingency, the fierce emotions and vaulting ambitions, that have characterized its history. It is a story full of ironies, of an enterprise that was created to manage the chaos of chance, and to answer by measurement and calculation what others could only debate.

Teleology and Purpose: Historical Implications

The statistical project, Pearson's endeavor, has not been passed over entirely by the historical gaze. Statisticians are no less interested in the history of their field than most other scientists, and there is by now a wealth of serious historical research from various perspectives on its development. The ideas and practices of the eighteenth and nineteenth centuries, when governments and reformers imposed quantitative order on unruly populations, have been particularly interesting to historians and social scientists.[4] In the twentieth century, the role of mathematics has become increasingly decisive, and studies of these new statistical tools and practices are gradually being written, episode by episode and discipline by discipline.[5] In the end, a picture will emerge of a powerful body of mathematics, allied to schemes for gathering data and designing experiments, that has become one of the most important sources of scientific expertise and guarantors of objectivity in the modern world. It is the narrow gate through which must pass new pharmaceuticals, manufacturing processes, official measures of all descriptions, and the empirical findings of psychologists, economists, biologists, and many others. In that sense, its import goes far beyond the history of a mathematical discipline. Statistics has functioned as no narrow specialty, but as a vital if often invisible element in the cultural history of government, business, and the professions, as well as of science.

In some sense this is widely understood, though more often by social scientists than by cultural or political historians. Sociology has a body of theory ready-made for explaining developments of this kind, one associ-

[3] Gigerenzer et al., *Empire of Chance*, chaps. 3, 7; MacKenzie, *Statistics in Britain*.

[4] Some books on the subject: Stigler, *History of Statistics;* Porter, *Rise of Statistical Thinking;* Hacking, *Taming of Chance;* Desrosières, *Politics of Large Numbers.*

[5] For example, Krüger et al., *The Probabilistic Revolution;* Danziger, *Constructing the Subject;* Dehue, "Deception, Efficiency, and Random Groups"; Morgan, *History of Econometric Ideas;* Marks, *Progress of Experiment.*

ated particularly with the name of Max Weber, which presents a process of "rationalization" as intrinsic to modernity, and identifies science and bureaucracy as its standard-bearers. From this perspective, the development of quantitative methods is readily seen as important, but also as natural and even inevitable. The reconstruction of history as teleology has to some degree been the fate of all the sciences, whose stories continue to be told in textbooks and journalism as epics (or often mere lists) of theoretical and experimental advances. Even if this were an adequate way to write the internal history of science (most historians of science these days think not), there is nothing inevitable about its cultural and political role.

The very boringness, as most people suppose, of quantitative methods testifies to their pervasiveness and to a common assumption that their application is virtually automatic. Yet their success was never easy or routine, but was challenged repeatedly on many levels. That point is immediately evident in any serious historical study of measurement and quantification in practice. Their aggressive impersonality may not point to any inherent tendency of bureaucratic activity or scientific investigation, but rather to a flight from the subjective in the face of suspicions and challenges.

This book explores the topic of objectivity and its contradictions from a different angle, focusing on an individual rather than a set of impersonal institutions. It is, in a way, the life of a great statistician, yet the first seven of the book's ten chapters are not mainly about statistics. I discuss in the epilogue the implications of my attention to a single person, and the standing of the individual in science. Here I emphasize some of the advantages that the more tightly focused perspective brings, apart from the immense fascination of this varied and tormented life. Its protagonist emerges as receptive and yet doctrinaire, participating in the great scientific and social movements of his time but never at ease with them. His mission, as it emerged in the early 1890s, was formed of many ingredients, including religiosity and unbelief, historical vision, "the woman's question," eugenic socialism, applied mathematics, and evolutionary biology. These materials were made available to him by his culture, and a crucial element of the story is how he sought to integrate them into a coherent life. He wanted science to become the basis of shared values and a unified culture, as the Church had been for medieval Europe. Yet he lived at a time when strong moves to disciplinary specialization were narrowing the public role of science. His own field of statistics, despite its universalist claims, tended more to advance than to inhibit these developments.

If an "age of science" means that scientific knowledge or training should bring access to the levers of power, then Pearson's time was not really one of these. Although he was able through his immense determination to build a "biometric school," he was rarely a consultant to the powerful, and his methods only slowly penetrated a civil service dominated by men

formed on very different principles from those he offered. What he advertised as a new, general method, they understood as a technical specialty, which, as such, would at best be suited to contribute to the consideration of certain narrow questions. Pearson optimistically anticipated that in the end the governors would recognize their need for his tools, and in a way this proved right, but he could not have felt himself, in his own time, supported by the crushing force of modernity. His was, in a way, a utopian project, even a hopeless quest, and quantifiers had to play a role in creating the conditions under which their methods would become influential. Such methods have never been hegemonic, except in very particular domains. A focus on a single career, and especially this one, brings the seeming colossus of quantification, and its sibling "scientific method," into the contingent domain of history. It reveals many of the cultural components out of which these ambitions were fashioned, how they were situated in a field of competing alternatives, and how a program for science such as Pearson's presumed also a vision of the moral character of its practitioners.

The Significance of a Life

A life such as Pearson's would provide excellent materials for a novel, and I have tried in this book to develop some of its novelistic aspects. But these, too, can be historically situated, and they pertain to an enterprise that has made a difference. Pearson helped to create something new and important, a body of applied mathematics allied to a conception of scientific rationality as a form of personal renunciation. These intellectual and moral qualities were suited, he thought, to the vital role the scientist must assume in the coming socialist state. Obviously it was not in his power to determine the form and role of expertise in his or any other polity, but in time the field of statistics took on a key role in defining objective knowledge in administrative as well as scientific contexts. Pearson's philosophical conception of science was particularly influential in relation to policy-oriented sciences, and provided a model, convincing to many, of the moral qualities of the scientist. Pearson's career as a historian, feminist, and socialist, and the sense of rational selfhood he worked out through those efforts, mark an important episode in the history of the *scientist* as a form of life and as a professional category.

From this perspective, the central document in the Pearson corpus is his book *The Grammar of Science,* first published in 1892. It was the outcome of his physical researches on the mathematics of elasticity in relation to a bold theory that would explain the whole range of physical and chemical phenomena in terms of ether pulsations or, later, "ether squirts." *The Grammar of Science* expressed wider ambitions as well, joining a philo-

sophical skepticism about our access to an independently existing world of things in themselves with a bold claim for the unlimited scope of science. To this was added a moral vision of scientific method as the very basis for modern citizenship, because it provides standards of knowing that are independent of all individual interests and biases.[6] The epistemology preserved and modified the German philosophical idealism to which he had recourse when he lost his Christian faith; the moral arguments were distilled from more than a decade of his lectures and writings on socialism, religious history, and feminism; and the vision of impersonal science was among other things a solution to his intensely personal anxieties about egoism.

It was also an important book for its age. Lenin, who thought that Pearson's explicit philosophical idealism exposed the true reactionary tendencies of the new positivism, offered backhanded praise for his philosophical consistency. Henry Adams, in one of the more memorable sections of his autobiography, declared epigrammatically that "the rise or fall of half-a-dozen empires interested the student of history less than the rise of the 'Grammar of Science.'" He interpreted it as one mark of those scientific and technological changes to which he, a scion of New England patriarchy, had been unable to adapt. Pearson, he thought, had destroyed the order of nature, leaving a chaos of chance, and had reduced "truth" to "a medium of exchange."[7] Others were more favorable, and some saw the *Grammar* as the beginning of a new age, a work of revolutionary boldness. Albert Einstein in 1902 formed a little reading group in Bern, which began its study with Pearson, and there is evidence of a Karl Pearson reading group at the University of California about the same time. Radical social scientists were delighted at how Pearson joined socialism to the scientific standpoint. Many were enchanted by the prospect of quantitative objectivity. Lancelot Hogben, late in life, reminisced that his generation had "been suckled on the *Grammar of Science,*" receiving it as a new evangel.[8]

While others were becoming excited about his *Grammar,* Pearson was beginning to receive the gospel of statistics, first as a graphical method, and then as a program of biological measurement and quantitative analysis. In the early twentieth century, the *Grammar* was understood by many, including by Pearson himself, as a philosophical rationale for statistics, though in fact he took up statistics only after completing its first edition.

[6] Porter, "Death of the Object," and Porter, *Trust in Numbers.*

[7] V. I. Lenin, *Materialism and Empirio-Criticism: Critical Comments on a Reactionary Philosophy* (1909; Moscow: Foreign Languages Publishing House, 1952); Henry Adams, *The Education of Henry Adams* (1918; Boston: Houghton Mifflin, 1961), 450, 456.

[8] Albert Einstein, *Letters to Solovine,* trans. Wade Baskin (New York: Philosophical Library, 1987), intro. by Maurice Solovine, 8; Hogben, *Statistical Theory,* 326; W. M. Conway to KP, 30 Dec. 1901, Pearson Papers.

Thereafter, right to the end of his life, Pearson would make it his mission to reshape science using the tools of statistical mathematics. From 1893 to about 1905 he published a series of papers that gave a new direction to the field of statistics. In 1901 he founded, in collaboration with Francis Galton and W.F.R. Weldon, the journal *Biometrika,* which was dedicated to this project. He personally wrote or put in motion the research for most of its contents, and he felt responsible to make almost every paper an adequate expression of his conception of the field. That is, he ran it with the heaviest of editorial hands, setting a standard against which modern literary questions about the meaning of "authorship" appear thin and academic. Little wonder, given his refusal to tolerate dissent on such important matters, that he was engaged in perpetual controversy. Those who would push the project further, including some of his own students, could not avoid his wrath, yet they remained practitioners of the discipline that he established. Some, such as R. A. Fisher, inherited also his missionary ambitions, which bear some responsibility for the continued fractiousness of the field of statistics, the obverse of this Pearsonian faith in the one true way.

Pearson's third great missionary campaign, though it has appeared increasingly disreputable since the 1930s, was eugenics. In this, as in statistics, he was a proud follower of Galton, and the broad argument for the relations between his statistical and his eugenic ambitions remains convincing.[9] He refused to compromise himself by joining any movements or by engaging in concrete politics. Yet he sponsored and delivered a regular program of public lectures on the urgent need for scientific study of eugenics, which should lead in time to a program of political action, a new socialist program. Pearson derived from eugenics also a sense of connectedness with the deeper purposes of life, a pantheistic wholeness recalling his early admiration for Spinoza that was hard to reconcile with the positivist's alienation from nature.

My investigation of these topics has drawn me also into the more private domain of family tensions, religious angst and connectedness with nature, tangled relationships of friendship and love, and even sexual experiences. In his youth he imagined himself a poet, and as a young man he undertook repeatedly to reconstruct his life as a witty or tragic novel. These episodes I find fascinating in themselves, and it has not been my aim to dispatch them efficiently. All, however, are in the end incorporated into a narrative that forms an argument, one that integrates the private into the scientific life of this applied mathematician with, I believe, a richness that has rarely been possible in writing about science. A history of this sort depends on the rich horde of documents Pearson preserved, but also on the peculiar

[9] See discussion of eugenics in chapter 9.

character of the man. Pearson universalized the life of the mind, analyzing and theorizing about what most others have seen as strictly personal matters. For him, science had no limits, and scientific method was all the more urgent in regard to what seemed most unreasonable. He came before the world as a distinctive scientific persona, but he worried without end about the implications of science for the person—one might almost say the soul. He did not reduce the relation between the self and the natural or social order to one of mirroring; but every genre in which he wrote, including mathematics, drew from and had implications for a moral sense of personhood and a vision of cultural reformation.

Pearson was in many ways poorly socialized, a thoroughly original character who, while drawing deeply and repeatedly from the cultural resources of his time, rejected many of the conventions of his class and his profession. It would be absurd to present him as typical of anything, and no straightforward generalizations can be founded on a study of this odd life. Yet there is a sense also in which his experience makes richly visible what is, if not the rule, certainly much more than the exception: interpenetrating definitions of *science* and *scientist;* complex trajectories of intimacy with and detachment from nature; a tangled relationship, no mere opposition, between understandings of the personal and claims about the universal; and the ambition to construe scientific method not merely as the discipline necessary to produce expert knowledge, but as a cognitive and moral framework for the formation of citizens and elites.

The Personal and the Impersonal

The "impersonal" for Pearson and for other Victorian moralists was not the contradiction of personal cultivation, but its fulfillment, representing the possibility of raising oneself above selfish egoism. Not for nothing did he regard Goethe's *Wilhelm Meister* as a formative work, for Pearson viewed life in the guise of a bildungsroman. Intensely self-conscious as he was, he constantly assessed himself against this standard of individual growth. The profusion of his own research interests, while allowing the development of all his capacities, threatened also a fracturing or dissolution of the integral self. The consummate meritocrat, he worried throughout the 1880s that he had squandered his talents by dabbling. Yet he did not want to be trapped in professional deformation, the narrowing and distortion of self that advocates of "culture" identified with research science. Statistics was the answer to his quest for a life mission, a field defined by methodology and mathematics that licensed him to make incursions into every man's specialty.

Science was also, for him, the legitimate object of passion, a release from sectarianism. He praised the virtues of impartiality first of all in his researches

on Reformation Germany, a topic about which nobody in Christian Europe could write impartially. The scientific attitude took on a deeper meaning in the group he set up in 1885, the "Men and Women's Club," where impersonality was cherished particularly by women for the access it gave them to the intellectual world of men. The novelist and club member Olive Schreiner, echoing Pearson's admiration for Spinoza, celebrated his devotion to "intellectual love," even if she sometimes wrote with biting irony of his icy detachment. Her ambivalence reflected some contingent circumstances, for impersonality is naturally less appealing in a person with whom one has fallen in love. Since the club gave rise to a thicket of passionate attachments, among them Pearson's for the club secretary, Maria Sharpe, dispassionate inquiry became all the more necessary to preserve the ideal of friendship "from man to man."

An intense dialogue about surface and depth runs through much of Pearson's work. As a young man, he recorded several ecstatic encounters with nature, which he regarded as among the most powerful moments of his life. These were notably unscientific experiences, and his subsequent identification of knowledge with numbers and cool precision was a real act of renunciation for him. In *The Grammar of Science,* he made rationality stand for distance from objects of desire, knowledge being only of sensations or appearances. This could scarcely have been satisfying to a man who repeatedly condemned "sham" and disguise, and whose habit of self-revelation reflected a need to feel understood. To be sure, there was always an element of metaphysical idealism—implying a different and deeper reality—in his denial that we can make contact with the material world. This dimension, however, became less and less prominent as he placed increasing emphasis on the instrumental efficiency of measurement and calculation in a world of endless Darwinian struggle. Whether from resignation or heroic self-denial, he sacrificed much of the satisfaction of intimate connection with nature for the sake of detached, impersonal, quantitative formulations.

Science also meant the control of individualistic egoism. As a historian, he expressed this moral viewpoint with his strong preference for "Catholic socialism" over the reign of exploitative self-interest brought by Martin Luther. Protestantism he saw as the progenitor of the capitalistic economic system against which he struggled in his own time, and which he thought was destined soon to pass away. He held up scientific method as the only proper basis for true, socialist citizenship, since it provided standards of knowledge and belief that were binding on everyone. As ever, Pearson's public campaign was also a personal one. As he explained to Maria Sharpe in 1889 during the first phase of their traumatic engagement, he feared his inherited tendency to selfish egoism. Woman, as mother, stood for the possibility of selfless love, yet by sacrificing themselves, women also en-

couraged the excesses of male egoism that were depicted so disturbingly in the literature of Henrik Ibsen and George Meredith, as well as in the sad domestic scenes of Pearson's childhood. The emancipation of women, essential for the ideal of self-development that he applied evenhandedly to boys and girls, was required also for the morality of the new man. Pearson's emphatic identification of science and impersonality was thus but one element in an enduring campaign to subordinate the self, especially his own, to higher ends.

Pearson was anything but the passive recipient of influences. He was a distinctly headstrong socialist, increasingly unwilling to participate in anything he did not found. He even withdrew to a large degree from the community of science, skipping most meetings of the British Association for the Advancement of Science, and (after 1900) publishing mainly in his own journals and pamphlet series. Yet he consistently emphasized, often with particular reference to himself, the ways that every person is the product of their age. His obsession with personal development, far from implying isolation from his culture, demanded that he seek out the best teachings he could find on religion, philosophy, history, politics, and science. His responsiveness to literature, in particular, reveals to what extent his scientific sensibility was rooted in a time and place. I do not define that rootedness in terms of effects on Pearson and then of his contributions to knowledge, but of the formation of an individual in perpetual engagement with his world. The person here is never isolated or independent, but neither does he disappear. Pearson was one of the first to talk of a dissolution of the subject, but his career of self-cultivation meant a tireless endeavor to find meaning and purpose in the world. Although some of those meanings now seem repugnant to me, and probably to most potential readers, I have tried to write in a way that takes them seriously.

In his biography of Galton, Pearson proposed a statistical solution to the problem of identity. "It would be an interesting problem to determine what is the degree of likeness of a man to himself, by correlating the habits and modes of thought of individuals at selected ages. We might thus obtain a measure of the permanence of individuality."[10] He added that Galton displayed a "marvelous sameness" over the decades. Marvelous it must have been, for Galton's mode of life and research interests changed utterly between the ages Pearson mentioned, twenty and sixty. Pearson's own life was no less wide-ranging, and he would no doubt have appreciated a statistical proof of its fundamental coherence. Neither reducing a life to an equation nor parceling it out among various scientific, intellectual, and personal ambitions was tolerable to him. For all his dedication to objectivity, he insisted on the role of individuality in science, the search for truth as the expression

[10] Pearson, *The Life, Letters, and Labours of Francis Galton,* vol. 3A (1930), 279.

of intellectual love. Yet in an age of teeming specialization, of reason reduced to calculation, science seemed less and less hospitable to the creative individual, restlessly seeking truth. Pearson's life, the story of an aggressive, angular, and deeply self-conscious scientist, is also an account of the changing possibilities of the scientific self in an age that has inclined to confine it and to isolate it from other aspects of this sometimes passionate process we call living, by making it selfless and objective.

CHAPTER TWO

Lehrjahre of a Poetic Wrangler

> Nevertheless, its aspect awed the father as already it had awed the nurse. The creature looked so unutterably solemn. It fixed its eyes upon Sir Peter with a melancholy reproachful stare; its lips were compressed and drawn downward as if discontentedly meditating its future destinies. The nurse declared in a frightened whisper that it had uttered no cry on facing the light. It had taken possession of its cradle in all the dignity of silent sorrow.
>
> —Edward Bulwer Lytton, *Kenelm Chillingly* (1873)

> But I think darling you are too premature in deciding that you cannot be happy.
>
> —Fanny Pearson to her son Carl, 30 September 1873

IF ALL BIOGRAPHY is in part autobiography, then there is much to be learned from Karl Pearson's *reductio ad absurdum* of the pious Victorian genre of life and letters, four quarto volumes, copiously illustrated, on his predecessor Francis Galton. It begins with a long chapter on Galton's ancestry, indispensable background to the life of the father of eugenics. The modern reader, at least, finds these pages to be full of ingenuous just-so stories: a quantitative disposition reflecting the hereditary business sense of the Quaker Galtons; a wanderlust—over scientific as well as terrestrial continents—inherited from two other branches of the Galton tree; and of course scientific ability from his Darwin ancestors. This did not mean that the child, father to the man, was formed independently of his surroundings, but rather that, through the force of inborn traits of personality, he contributed to the fashioning of an environment in which those dispositions could develop. The eugenic life meant a triumph of personal character over environmental influences. Pearson was fascinated also by his own progenitors, though they were not so renowned, and he spent many summer months near Danby in the North York moors, walking on the ancestral ground and inveigling the farmers there to bring him property records and marriage licenses for his genealogy. As with everything that interested him, he executed his project on a grand scale.[1] He considered that only an

[1] The genealogical tables he compiled from 1897 to 1900 are in Pearson Papers 2.

overwhelming hereditary stubbornness had enabled Galton's Quaker ancestors, and by implication his own, to hold out through the centuries of persecution. On one public occasion he summed up his own Quaker legacy as the source of two characteristics: "a capacity for hard work and a capacity for roving into other people's preserves."[2] No specialist barriers would block his forays into other disciplines when he believed that scientific right was on his side.

By the time he pronounced these lines, near the end of his life, he was thinking principally of the stream of controversies that marked his statistical career. As he recognized, however, the opportunity to roam widely as an "intellectual buccaneer" was not merely a happy by-product of his turn to statistics, but an important part of its initial appeal. His intellectual ambitions were still more far-flung in the 1880s, before his turn to statistics. He was acutely conscious of his tendency to range widely, initially because he sometimes reproached himself as a mere dilettante, and later when he recalled his early life as a triumphant romp through open fields of knowledge. He reminisced about his initial appointment at University College London: "Then Professor Beesley, just because I had lectured to revolutionary clubs, Professor Croom Robertson, just because I had written on Maimonides in his Journal, *Mind,* Professor Alexander Williamson, just because I had published a memoir on Atoms, and Professor Henry Morley, just because I had attended and criticised his lectures on the Lake Poets, pressed me to become a candidate for the chair of *Mathematics.*"[3] His point in this story, that he was happily engaged in the practice of law when these men persuaded him to think of a mathematical career, is quite false, and is most charitably understood as the pardonable hyperbole of an old man. It does not, however, exaggerate the extent of his interests. Whether for hereditary or other reasons, he had set his own course, pursuing the forms of knowledge he thought most vital with immense determination, and at a consistently high level. In addition to the studies he mentioned, Pearson had also by 1884 published on the cultural history of Germany in the Reformation period and tried his hand at a nineteenth-century passion play. He was then beginning to think systematically about "the woman's question."

His determined and wide-ranging explorations were in no way lighthearted, but were driven also by a deep urgency, a personal and cultural crisis flowing from a youthful loss of Christian faith. In this respect, at least, he was a good Victorian. We have no record of his early doubts, but only a diary entry from the summer or fall of 1877, during his twenty-first

[2] Pearson, *Life of Galton,* vol. 1 (1914), 9, 29–31, 40; Pearson, *Speeches Delivered at a Dinner,* 20. Neither Galton nor Pearson was raised as a Quaker. There were many expulsions in the nineteenth century, due especially to restrictions on marrying outsiders. Quakers, nevertheless, were often successful in business or the professions. Watts, *The Dissenters.*

[3] Pearson, *Speeches,* 20–21.

year, announcing that he no longer thought himself a Christian. Darwinian evolution was central to his later scientific career, but his religious convictions were not upset by science. He seems rather, like Galton, to have been troubled by the hypocrisy and insincerity of Christians. As he expressed himself in 1879:

> The antients felt and lived the creed they'd got;
> But now, where'er you turn you still will find,
> We think ours, write it, preach it, live it not.
> Missionaries, Manchester and murder are our lot.[4]

The old faith no longer provided a moral compass for society in this age of capitalism and consumption. Nor could it give direction to his own life. Pearson was desperate to find a sense of purpose, a calling. This was linked, for him, to questions about his place in the world, and to the possibility of knowledge about the world. He also yearned to know if and how the individual personality would survive after death.

His mature scientific philosophy was in many ways very skeptical on issues of this kind, dismissing most of the "great questions" as meaningless. The abandonment of Christianity for intellectual reasons despite an intense emotional commitment was, as he came to think, the prototype of the spirit of renunciation required by science. Already in 1880, within a few years of this crisis, he represented it in a published letter as a heroic act of self-overcoming: "No man rejects Christianity without a great and continuous struggle. . . . A battle like this, is in itself a purifying process, nay, a self-sacrifice, and by showing a man his intellectual impotence at least teaches him intellectual humility." It was a familiar Victorian autobiographical form, the record of a religious conversion, demanded by truth and achieved at the cost of great anguish. In the end, he discovered within science a sense of historical purpose as well as personal commitment: science defined the next, decisive phase in what he conceived as a grand saga of human progress. Personally, however, maturation meant for him a desperate search for meaning, which inspired, if it could not guide, his early efforts as a scholar, scientist, and writer.[5]

Family Matters

He was born Carl Pearson (he changed the spelling to Karl in 1880) on 27 March 1857, the second of three children of William Pearson and

[4] From Pearson's *Urwerther,* written 1879, discussed in chapter 3, Pearson Papers 11/4; on Galton, see Porter, *Rise of Statistical Thinking,* 132–134.

[5] Karl Pearson, letter to *Cambridge Review,* 2 (3 Nov. 1880), 55; Turner, "Crisis of Faith," 80–81.

Fanny (Smith) Pearson. The family resided in several neighborhoods north of London until 1866, when they moved to a house on Mecklenburgh Square in Bloomsbury. His brother Arthur was sent to Rugby, where, it may be noted, his father pressed successfully a request that the boy should begin studies in German. William Pearson saw knowledge as the key to success and told his boys that this required thoroughness in study. Cramming, as he explained to Arthur, "produces appearances only, with no substance behind—mere husk and shell which when opened shows no fruit," and he called for "much patient and painful industry steadily and perseveringly applied."[6] Karl, in contrast to Arthur, never spared himself that industry, nor had his father.

This family background was not without its tensions. His father had grown up among Quaker relatives in York, but his ambitions had driven him to Edinburgh, where he took an LL.D. degree, and then to London, where he read law at Inner Temple and became a barrister. His intelligence and hard work raised him to the top of his profession, an appointment as Queen's Counsel ("Q. C.") in 1875. The price of this success was a separation from the Yorkshire countryside, which he always loved, and apparently his alienation also from his own parents. At least Karl never met his paternal grandmother, though he was twenty-five when she died.[7] At the time of William's death, in 1907, Karl recalled him in these terms:

> An iron man with boundless working power, who never asked a favour in his life, and never really got on because he forgot to respect any man's prejudices, and never knew when he was beaten. I learnt many things from him, and know that I owe much to him, physically and mentally. But we were too alike to be wholly sympathetic. He thought my science folly and I thought his law narrowing,—the view of both of us being due to an inherited want of perspective in the stock!

He elsewhere described his father as cool and remote; as rising before dawn to read briefs and prepare arguments, and returning home only in time for dinner and then bed, so that the children scarcely saw him.[8] Karl seems to have exaggerated; William Pearson could be blunt, and he had a temper, but an unmistakable concern and even tenderness show through in his letters to the youth. The difficulties of their relations were greatly exacerbated by a rift between "the Pater" and "Mère" (as she signed her letters). Fanny Pearson presented herself to the children as vulnerable and

[6] Edward Scott to William Pearson, 30 Sept. 1870, Pearson Papers 9/3; William P to Arthur Pearson, 30 March 1873, Hacker Papers, Box 8, "Heritage 4."

[7] KP to William P, 5 May 1882, Pearson Papers 927, on the occasion of Elizabeth Beilby Pearson's death. His grandfather, Thomas Pearson, died in 1859.

[8] KP to Galton, 16 Oct. 1907, Galton Papers 293, printed in Pearson, *Life of Galton,* vol. 3A (1930), 327–328; Pearson, *Speeches Delivered at a Dinner,* 19–24.

Figure 1. William Pearson. The stern, egotistical Pater? (Courtesy of University College London)

Figure 2. Fanny Smith Pearson. The generous, vulnerable Mère. (Courtesy of UCL)

mistreated, virtually compelling the boys to take sides. They chose her. She was especially close to and dependent on her most sensitive son, Carl.

In 1912, in the course of researches into his eugenic background, Pearson asked his mother's Yorkshire neighbors, who had known his parents in childhood, about the family "temper, waywardness, or habits." One of them replied that his parents' marriage had been troubled from the start and blamed it on the self-indulgence of Fanny, who with eyes open had married this intensely ambitious young man and then allowed herself to become unhappy because he did not lavish attention on her.[9] This was not how it had seemed to the sons, who took it on themselves to defend their mother against the paternal asperity. Vacations were particularly tense, and in the late summer of 1873 there was such a crisis that Fanny fled to seek refuge with some of her relatives. Arthur and Carl joined forces on her behalf. "Papa is very silent, merely asking questions," wrote Arthur to her the next day, "but at dinner he said something which caused me to fire up and I gave it him 'hot and strong'; let him know that I entirely agreed with you." Carl declared that he could "*never* I think look on Papa as I have done after what he has said and done."[10] A few weeks later he told his mother that he could never be happy, and his bitterness toward his father remained with him for years. Since, however, he became increasingly convinced that he was cut from the same cloth, his discontent was perhaps not directed exclusively outward. By contrast, his relations to Fanny remained close. He told her about interesting experiences, shared at least some of his anxieties, and exchanged opinions on books and other intellectual matters. For many years, each looked to the other for emotional support.[11]

Parents and children alike supposed that the sons would grow up to follow their father's profession, though they seemingly were not pressured to do so.[12] Carl's intense intellectuality made this more doubtful, and by 1884 when he received his university appointment he was in truth immensely relieved to escape the law. His brother Arthur, who also was called to the bar, practiced only in a desultory way, living on family money and then on an inheritance that had once been intended for Carl. This was from Mr. Gee, a childless client of William Pearson, who had proposed to confer his fortune on the second son on condition that he take Gee's name. But Karl and Gee had a falling out, probably as a result of a meeting in Innsbruck in 1881, supported by Gee's well-grounded suspicions of longer standing that Karl disdained him "for his lack of culture." Karl told his mother on this occasion that Gee was the worst specimen of the

[9] Eliza Rains to Pearson, 11 Aug. 1912, typed in Hacker Papers, Box 7.

[10] Arthur P to Fanny P, 2 Sept. 1873 (Hacker Papers, Box 8) and KP to Fanny P, 3 Sept. 1873, Pearson Papers 924.

[11] Kevles, *In the Name of Eugenics,* 22.

[12] See further discussion of this point in chap. 5 below.

Englishman abroad, and that he had abandoned his own plans to continue to Vienna so he could avoid meeting once more his awful benefactor. The will was rewritten in favor of Arthur, whom it eventually supported in gentlemanly idleness.[13] Gee, and even Arthur, embodied for Karl the evils of inherited wealth. Arthur's early death in 1896 moved Karl to write a brutal letter to his mother about the venereal ailment that carried him off, but it occasioned few signs of emotional loss.[14]

An Earnest Child

What documents survive from Pearson's youth give the unmistakable impression of an earnest and highly sensitive boy. He was not sent to face the rigors of a "public" boarding school, such as Rugby, but stayed at home until age fifteen and studied at University College School. Even this was a strain for him; the boy was evidently plagued by delicate health. In late March 1873 his father mentioned in a letter to Arthur that Carl was "low and miserable." "We are all much pained and disappointed at Dear Carl's breakdown," wrote a sympathetic school official at this time.

His parents hoped that a quieter life might suit the lad, and his father began looking for "a good Cambridge Wrangler—a beneficed clergyman in the country—to take him and prepare him for Cambridge."[15] In September, young Pearson went off to the vicarage at Hitchin, about 30 miles north of home, to study with Lewis Hensley, who had been senior wrangler and Smith's prizeman in 1846. That is, he had taken both the top mathematical prizes at Cambridge. Once more, Carl was miserable. "I can understand Arthur's first trials at Rugby now, but there all was routine and life, I am left entirely alone with nothing to do but break down. . . . Papa will laugh & say I shall get over this & perhaps I shall, but if there was only some fellow of mine own age instead of these smoking brutes." He alone among the students at the vicarage was not living just for the moment. "I feel very sad about getting on, no-one here works at all . . . , for instance I have been vainly trying to work this afternoon, but the others having been playing the banjo & singing have completely prevented it, so that I

[13] KP, "Childhood Memories," Hacker Papers, Box 8, "Heritage 2," gives the date as 1878–79 and says he had objected during a holiday abroad when Gee was "abominably rude" to a waiter. But there is no evidence that he met Gee during his German stay in 1879, and the incidents described in letters to his mother broadly match his description. See KP to Fanny P, 12 Sept. 1881 and 16 Sept. 1881; also Fanny P to KP, 7 Nov. 1879, Pearson Papers 787.

[14] KP to Fanny P, 19 Jan. 1896.

[15] E. R. Horton to William P, 31 March 1873, Hacker Papers, Box 8, "Heritage 4."

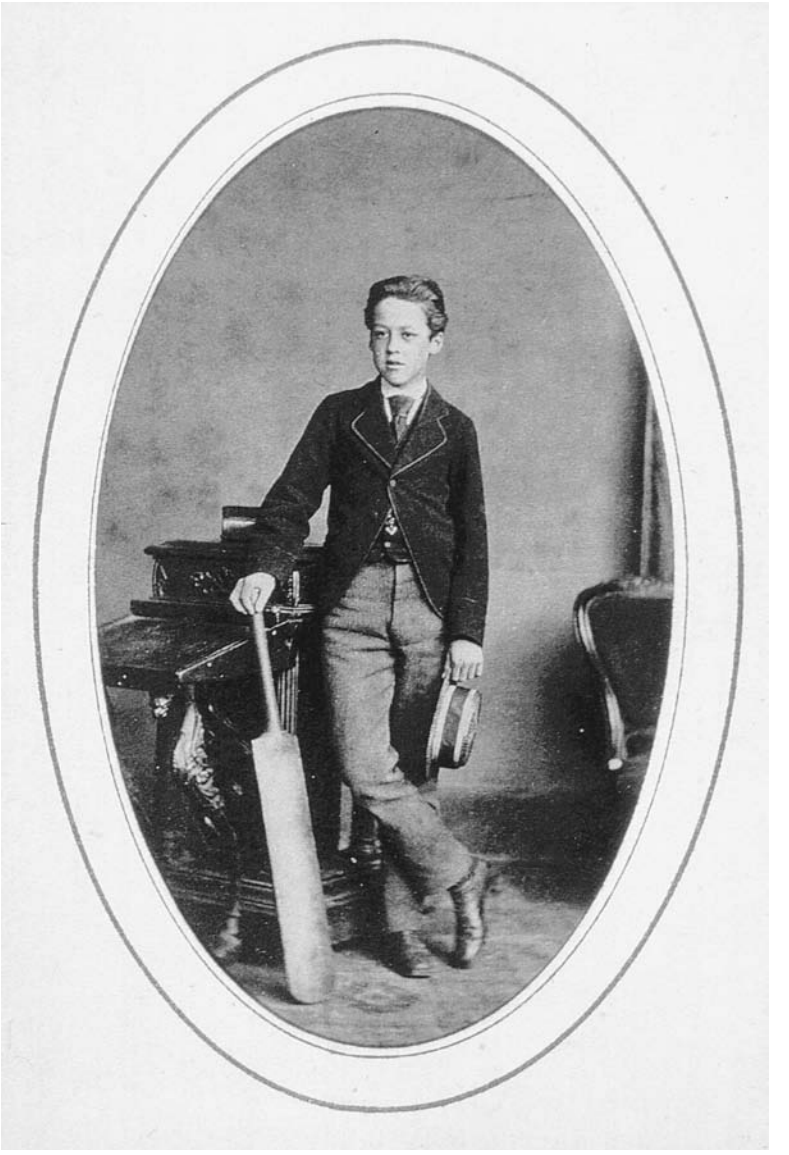

Figure 3. Karl Pearson. Schoolboy with cricket bat. (Courtesy of UCL)

had to give up." If he could not pursue a real education, he feared, "I lose all chance of ever doing anything either at Cambridge or in the world."[16] Fanny's response, though consoling, reaffirmed the implacable necessity of work if he was to "get on in life. . . . Papa & I ever feel that you will do your best to get on. Oh darling don't disappoint us." The boy was also "sick" of the "indecent conversation" of his fellows, perhaps, he reflected, because of resentment that he was excluded, and perhaps on account of "my own sense of what is right." He was sincerely religious, attending services regularly during this period. The smoking brutes were less pious: "I was the only one down to prayers last night."[17]

Carl Pearson's depression was, as his parents recognized, partly a matter of homesickness. His mother responded always with support and affection. Even his father did not, as he gloomily anticipated, lightly dismiss his suffering, but sent encouragement as well as advice. The advice included instructions on "how to take a cold bath properly." He should not slouch his body all over, but only sit in the cold water while sponging himself with tepid water from a separate vessel. "You cannot bear the driving of the blood from the extremities—either hands, feet, or head," which might indeed bring on heart disease. As for his education, William Pearson took seriously his discontent, allowing the boy to apply to be tutored at Cambridge prior to entering the university as an undergraduate. This meant a round of examinations in March 1874, while visiting his brother at Trinity Hall College. His success at this level entitled him to take up residence at Merton Hall in September and to commence in earnest the competitive life of Cambridge meritocracy.[18] Two tutors, James R. Harris and John Peter Taylor, began in the fall to prepare him for the college "exhibitions," or scholarship examinations.

In January 1875, encouraged by his father, he started work with the most celebrated of Cambridge mathematical "coaches," E. J. Routh, whose students dominated the all-important Mathematical Tripos for two decades. Among those in his cohort was William Martin Conway, subsequently Pearson's intimate friend. At this point Carl was obsessed with the hoops through which he was expected to leap, and he complained to his mother that Routh's tutorial work that term would "not be of the least use

[16] KP to Fanny P, 29 Sept. 1873.

[17] Fanny P to KP, 21 Oct. and 16 Nov. 1873; KP to Fanny P, 7 Oct. 1873. He discussed the experience in Hitchin with more detachment in "Old Tripos Days," 28. On Hensley, see Venn, *Alumni Cantabrigienses,* vol. 3, 333.

[18] *The Student's Guide to the University of Cambridge,* 3rd ed. (Cambridge, UK: Deighton, Bell, 1874), is devoted almost entirely to preparation for the various Triposes, through which honors were awarded, and to the merit scholarships and prizes awarded by the various colleges. Pearson and his father clearly had Cambridge honors in mind from a young age.

for this exam." By this he seems to have meant the spring scholarship examination at Trinity College. His father told him in reply that he should hire a tutor such as Harris to work up materials for his more pressing needs, and not study too hard for Routh.[19]

In the event, he was only partly successful in the examinations later that spring. The examiners at Trinity, the most prestigious of the Cambridge colleges, determined (as they informed him) "that you have been hurried on too soon into the higher subjects before having obtained a thorough grounding in the lower ones." This was clearly a criticism of some kind, either of Routh for teaching abstruse materials to a student so young, or of Pearson for beginning with a Tripos coach before he had even entered as an undergraduate.[20] The time was not, however, wasted, since Routh's topic for that term, the mathematical theory of elasticity, provided the basis for Pearson's research program in applied mathematics right up to his switch to statistics in the early 1890s.[21]

Sixty years later, in an oft-cited essay, Pearson spoke of the experience as if he had been indifferent to the pressure to succeed, and had simply exulted in the abundance of mathematical and other intellectual opportunities at Cambridge. There he identified the unfamiliar material as Legendre functions, and the questions as elementary for anyone who had studied them. In contrast to the contemporary description of his desperation, he imagined his youthful self as almost serene. He was fascinated, he recalled, by the ingenuity of an examiner who could invent such interesting functions, and so, out of curiosity, devoted most of his attention to them.[22]

[19] See KP to Fanny P, 27 Jan. and 4 Feb. 1875; William P to KP, 7 Feb. 1875; Conway, *Episodes in a Varied Life*, 49. Pearson also recalled the coaching from Routh in 1875 in "Old Tripos Days," 28. These fascinating recollections, written sixty years after the fact, have many errors and inconsistencies. But I think he was accurate in recalling that at first, in the spring of 1875, he and the other (pre-undergraduate) "beast," Conway, met alone with Routh. After one term, Conway dropped out, and for the rest of the year Routh lectured to him alone in a weekly session at 7:00 A.M. In the next term, Pearson joined a regular coaching session, but he may have continued to study elasticity alone with Routh. Conway, who left Pearson entirely out of his autobiography, claimed that he gave up on Routh's coaching sessions because J. J. Thomson's performance so far surpassed his own. Evans, *The Conways,* 56, has Conway being coached with both Pearson and Thomson. But Thomson did not come up to Cambridge until 1876.

[20] E. W. Blore to KP, 10 April 1875, Pearson Papers 11/3, transcribed in Hacker Papers, Box 8; Pearson, "Old Tripos Days," 30, mentions the possibility that the examiners were suspicious of his advanced reading with Routh. He recalled this letter as having come from the mathematician James Glaisher.

[21] Pearson's recollection on this point is confirmed by a contemporary letter, Conway to KP, April 1875, Pearson Papers 666/3. Routh had assigned them "Lamé's Elasticity, . . . a nasty French book printed on blotting paper." Contrary to Pearson's reminiscences in "Old Tripos Days," it was among the books recommended for Tripos preparation.

[22] See "Old Tripos Days."

But he was not yet so headstrong. His tutors, who knew better, offered explanations and consolation for his failure at Trinity. Harris told him that the Trinity exam was ill-chosen to bring out his strengths, and predicted that in the all-important Tripos he would beat most or all of those who had scored above him this time. Taylor explained to father William that the Trinity examination was based on a "bad plan," designed to challenge more mature students as well as new candidates, so that the latter inevitably confronted unfamiliar material. "Your son broke down completely on the first paper, an easy paper," which excluded him despite a very strong performance on the second and third papers. Carl had done more work than he had ever seen by anyone else in the same length of time: "[H]e has fine abilities & is most industrious—he is no doubt a little peculiar. We think him somewhat like the character of Kenelm Chillingly in Bulwer's novel—his principles are excellent, his conduct exemplary and we are very fond of him. I think he will take a first rate degree. *Pray do not press him. He is a most willing horse*—rather delicate too I think.[23]

At King's College, Cambridge

Pearson was consoled for the setback at Trinity by his success in the entrance examination for his second choice among Cambridge colleges, King's. This was above all a matter of honor, but meant also an annual scholarship of £80 and free tuition, amounting to perhaps half the expenses of residence there for a student of comfortable but not opulent background and habits.[24] The documents are silent on how he chose King's, which would be more puzzling for an aspiring mathematician than for a youth with literary and historical interests who was preparing to follow his father and elder brother into the law. King's College might almost have been a part of Oxford rather than Cambridge. Humanistic studies were notably prominent there, and the required mathematics lectures were too elementary for Pearson, or indeed for anyone being coached by Routh. Far more of his college friends took honors in classics or in the new modern history Tripos than in mathematics. Among those who wrote him letters I found several who subsequently took religious orders, and at least three who made careers teaching or writing about art; also a historian, a

[23] J. R. Harris to KP, 11 April 1875, Pearson Papers 11/3, transcribed in Hacker Papers, Box 8; John Peter Taylor to William Pearson, 15 April 1875, Pearson Papers 865/9. Bulwer-Lytton, a product of Trinity College, published *Kenelm Chillingly* in 1873.

[24] *Student's Guide to Cambridge,* 461–462. Under the new statutes, King's College was to consist of at least forty-eight undergraduates and forty-six fellows. It was to award twenty-four scholarships to Etonians and twenty-four more open scholarships. On college expenses see ibid., 69–103.

classicist, a schoolteacher, a lawyer, a physician, and just one serious mathematician. This last, William Herrick Macaulay, was by one year Pearson's senior and had completed the Mathematical Tripos—as sixth wrangler—a few months before he wrote his first (surviving) letter thanking Pearson for the loan of a book of Heine's poetry. Perhaps, as Pearson later implied, most mathematical students were so fixated on the grind of Tripos preparation, and the honor of finishing as one of the top wranglers, that they had no time to become interesting or well-rounded individuals. "Intellectual Cambridge at the present time is strictly monotheistic and its god is Tripos," wrote one of his contemporaries.[25]

King's College formed with Eton, the famous "public school," a single foundation. It preserved more liberty within the university than the other colleges, and it had been particularly resistant to the forces of reform. Some of the fellows in Pearson's time had been appointed under an older system when the college was more nearly a system of sinecures than a field of competition. Oscar Browning, a celebrated personage at Cambridge during the last quarter of the nineteenth century and a vocal advocate of change, spoke with seeming irony of the alliance with Eton as "a magnificent system for the endowment of research. An Eton Colleger went in due time to King's, if there was a vacancy for him, became a Fellow, took his degree without examination, and remained till the end of his days with increasing income and dignity unless he married or took a living."[26] King's and Eton were noted for cricket in those days.

Eventually, in 1851, King's lost or gave up its exemption from examinations. In 1860, for the first time, one of its students performed well enough on the mathematical Tripos to be a wrangler—there were usually about twenty-five wranglers. Browning, uninhibited by false modesty, identified the new era in the history of the college with the "scholars who came up in 1856," of which he was one. He added, however, that while he received instruction at King's, his "education" took place at Trinity.[27] When, in 1876, Browning resumed his fellowship at King's, he set about raising it to the standard of a first-rate Continental institution, such as the Ecole Normale in Paris, his favorite. But Trinity and the other Cambridge colleges formed a more potent model, since it was backed by pressure from Westminster. This model made the university into a system of assessment, to which

[25] Macaulay to KP, March 1878, Pearson Papers 753. In "Old Tripos Days," where Pearson celebrated the possibilities of the system in those days, he also complained that most of the mathematics students were interested in nothing but their Tripos results. He told of asking to breakfast a fellow freshman (!) mathematical student, who politely declined "because he was too busy working for the Tripos." On monotheism, see Ernest A. Parkyn, "Specialisation at Cambridge," *Cambridge Review,* 1 (3 March 1880), 71.

[26] Browning, *Memories,* 15.

[27] Morris, *King's College,* 40, 44; Browning, *Memories,* 19, 28.

education was largely subordinated. In the 1850s, King's had a reputation as "the only Cambridge college devoted to a genuine intellectual ideal, the only one whose students did not look upon examinations as the sole road to success."[28] That ideal persisted, somehow, through the reforms, and in the last quarter of the century the college flourished as never before. By Pearson's time, King's was particularly strong in historical research. It also provided opportunities to study art, literature, and philosophy.

In 1861, the college was finally opened to non-Etonians, and during Pearson's residence this group made up about half of the students. Browning and the other reforming dons such as university librarian Henry Bradshaw and historian George Prothero regarded Pearson as an exemplary, if somewhat prickly, specimen of the new King's undergraduate, and they supported him in more than one confrontation with college authorities. Unfortunately, almost nothing has survived from his life there in the whole period from the fall of 1875 to the spring of 1877. So complete a silence contrasts starkly with his next two years, which are documented by letters to his parents and to several college friends, and by his notebooks and incoming correspondence. There is reason to think he was lonely and unhappy during his first years at Cambridge. An oblique diary reference from the summer of 1877 implies a sense of isolation and low spirits. Both his father and mother encouraged him repeatedly to be more sociable so that he might make friends, and cautioned him against damaging his health by working too intensely. His academic success is evident from the King's examinations in June 1877, when he scored at the top of the list, with 1545 points compared to a second place 1115, and many now saw him as a future senior wrangler.[29] The pressure of such expectations may have been hard to bear. After 1877 his social problems lightened, and during the next two years he appears to have been well liked by his contemporaries and admired by his juniors at college.[30]

It is impossible to know just when or why his religious crisis began. The documentation of his life resumes in May 1877, when he demanded and obtained first an end to compulsory divinity lectures, and then to compulsory chapel attendance. Pearson, in old age, interpreted this episode as evidence of his strong-willed iconoclasm, not a wholly unreasonable boast. When, in the course of his appeal, he was asked to supply a statement of

[28] Rothblatt, *Revolution of the Dons,* 221–222.

[29] William P to KP, 26 April 1875, 4 March 1877, 16 Aug. 1876; Fanny P to KP, 14 April 1875. I. D. Binney to KP, 11 June 1877, Pearson Papers 636/4; on senior wrangler, see KP to Browning, 18 Sept. 1877, Modern Archive Center, King's College Library.

[30] E.g., W. Rhys Roberts to KP, 18 Feb. 1901, "Probably you little think how much your example meant to your juniors at King's, & with what admiration they have watched you living the students' life & enjoying year after year in persistent & well-directed work." Pearson Papers, 829/8. Also Robert Somervell to KP, 28 Dec. 1882, Pearson Papers 859/2.

principle, he was ready with one. "I have conscientious objections to any form of compulsion in Religious matters, believing that freedom is the very essence of Religion, and considering that compulsory attendance at services which are liable to be wearisome, whether the mind is fitly disposed for devotion or not, tends to destroy entirely all religious feeling." This argument, however, was mixed with various other considerations. His appeal emphasized also pressure of time as an important reason he should be freed from divinity lectures. Having attended them in his second year, he was required to continue into his third only because he twice failed a required examination on religion. He did not, in fact, stand against the united forces of college conservatism, but was supported throughout the ordeal by Browning, as well as by a certain London barrister, now Queen's Counsel. In the end, Pearson threatened to leave King's for another college, taking, one supposes, his Tripos prospects with him, and this finally brought the college around. His victory won, he continued from time to time to be seen at chapel. He explained that he objected only to *compulsory* attendance.[31]

Religious Doubts, and Life Made Fiction

By this time, he was suffering acutely from religious doubt. Agnosticism was becoming the rule rather than the exception at Cambridge in these years, if we are to believe the recollections of a King's student three years his junior.[32] Pearson also had been driven very hard in his studies—and for what? He may have been conscious of analogies between his situation and John Stuart Mill's well-known crisis, and, like Mill, he looked first to literature for guidance and consolation. In the summer of 1877 he started a Commonplace Book.[33] At the beginning, where some of the pages are dated, they proceed from October backward in time to July. These first thirty-two pages consist of poems and short prose passages, sometimes with commentary, from books he was reading, and also some verses of his own. This material is followed by an introspective essay of fourteen pages, and then by an ironic commentary.

The authors he was reading included Shelley, Rousseau, Voltaire, and Goethe, his favorite. He also copied extracts from Tennyson's "In Memoriam" and Edward Young's graveyard poem, the "Night Thoughts." He rendered his own sadness literary in a verse that he later incorporated into

[31] Draft letter, KP to J. E. Nixon, Pearson Papers 11/3 file 1; also Hacker Papers, Box 8.

[32] Somervell, *Autobiography,* 74–76.

[33] His mother had recommended Mill's autobiography to him. What follows is from his Commonplace Book I, Pearson Papers 11/4.

several fictionalized versions of this time of troubles. "Thou mystic goddess of my soul!" it begins, "O fickle Melancholy dear!" His skeptical gloom appears also in a copied passage from *Wilhelm Meister* about the world being woven of chance and necessity, and of how the uncontrollable results of the former are attributed retrospectively to divine plan.[34] From Rousseau's *Essay on Inequality* came the sentiment that mental reflection is "against nature." He included jokes and laments about the fickleness and impurity of women, but also bitter rebukes of the economic system that compelled so many to sell themselves on the streets. His melancholy, indeed, was not linked exclusively to religious doubt, but was equally the outcome of frustrated ambition and an outraged social conscience. From essays by John Morley, radical editor of the *Fortnightly Review,* he learned that Rousseau and Voltaire had been "the two great forces" of the French Revolution. "Society had hitherto been a mass of hypocrisy & cant, this Rousseau was to overturn by an appeal to Nature, an appeal purely to the sentiments." Such readings inspired his poetic megalomania, clearly recognized as such, in some verses on "wild ambitions." "I thought there was a mighty poet born," he imagined:

> A Byron Keats or Shelley would I be.
> (I thought in truth I could be all three.)
> The world forsooth I'd revolutionize.
> Abolish kings, priests, customs, mockeries.

His introspective essay in the diary concerned mainly his religious doubts. "I have often thought I would try to analyse my feelings till I was left with some definite idea of what religious belief I have or whether I have any at all," he began. But "all I am sure of is that my mind is *chaos* at present. I think I have definitely rejected Christianity, perhaps more from disgust of its professors than of real knowledge of its virtues & vices." It "seems to me a dying faith," he continued, one that had "played a glorious part in its day," but began necessarily to decline once it set itself against the new learning and against "progress." The ironizing quotation marks around progress reveal the gloomy admirer of Rousseau, who adored nature and was drawn to the primitive. He loved to be alone in the country, and when he thought of divinity in relation to the natural world rather than society, he sometimes supposed he might still be a deist. Indeed, to be surrounded by all this beauty, seemingly created for his benefit, made him feel as if he was equal to the gods, he told himself. In civilization, on the other hand, he found nothing but "misery, hypocrisy, and blasphemy." The existence of so much poverty, when he could enjoy the luxury of passing the time in

[34] From *Wilhelm Meister's Apprenticeship,* Book 1, chapter 17; the passage is in German, though he quotes also from Carlyle's translation.

beautiful surroundings reading Goethe, burned his social conscience. "In such moods I hate mankind, society appears blacker & blacker to me & the contrast makes nature fairer & fairer." He thought of escaping somewhere to the backwoods, "of playing the man of nature out there like Thoreau." And he contemplated suicide, in order to unpuzzle by fiat the tormenting mystery of whether there be an afterlife.

No less revealing than Pearson's painful self-examination is the next fragment in this Commonplace Book, wherein our author created an alter ego to take on the burden of this literary life. Pure earnestness became dissembling revelation, the self reconstructed as fiction. For this he invented Ralph Hewitt, a "strange dreamy being," often to be found taking solitary rambles in the country, who subsequently escaped civilization to Texas, where he died of marsh fever. "Hewitt & I had been contemporaries two years ago at college"—Trinity College, the manuscript explains. Hewitt was expected to rank high in the Tripos, "even senior some said," though he was often "in hot water for breaking some college rule or other. He hated any bond or restriction to his liberty." In fact, a James Hewitt had entered Caius College in 1875, Pearson's year, then left in 1877 without taking a degree.[35] It would be remarkable if this historical Hewitt perished in Texas, and still more so if his sister passed along to Pearson his notebook, "filled with an odd miscellany enough, scraps from Goethe in the original & in rhymed translations, criticisms of Voltaire & Rousseau, & several pieces of original verse which is very poor." Hewitt's "eccentric ways" would, in that case, have been revealed in a longer essay, dated one week before his departure for Texas. "It is as follows—(see M.S.S.)," Pearson explained, referring back, we must suppose, to his own essay. Thus was his commonplace book, transformed into the fragmented literary remains of an odd, discontented, nature-loving utopian who, through death, had learned at last "the secret of existence."[36]

The life of this fictionalized Hewitt, who had left behind little more than some "very illegible pages," recalls Thomas Carlyle's excellent conceit: six paper bags containing "miscellaneous masses of Sheets, and oftener Shreds and Snips, written in Professor Teufelsdröckh's scarce-legible *cursiv-schrift*" that arrived in reply to an imagined editor's query about the life of the great clothes-philosopher.[37] Since Pearson read *Sartor Resartus,* most admiringly, in the summer of 1878, and did not begin his second commonplace book until after the Tripos in 1879, his ironical commentary in this first

[35] Venn, *Alumni Cantabrigiensis,* vol. 3, 350.

[36] Pearson Commonplace Book I. This impatience to learn the secret of the afterlife is a particularly acute version of that dedication to science discussed in Levine, *Dying to Know,* esp. chaps. 10–11 on Pearson.

[37] Thomas Carlyle, *Sartor Resartus* (1833–34, Oxford: Oxford University Press, 1987), Book I, chapter 11. Pearson referred to the "Teufelsdröckhian position" in a letter about his *New Werther* (see next chapter): KP to Conway, 7 Oct. 1880, Pearson Papers 910.

commonplace book was probably written a year after the other pages. It was, by intention, funny and whimsical, as indeed was the life of Teufelsdröckh, and Pearson was evidently working toward a literary strategy like Carlyle's, which, through ironical fiction, placed some distance between himself and his extravagantly mystical alter ego. Carlyle, as a literary scholar explains, had allowed himself "full rein with the rhapsodic visionary Teufelsdröckh, while cannily retaining a commonsense, deflating presence in the form of the professor's English editor."[38] Conscious that he was making his way through uncharted waters, and recognizing the element of self-obsession in his ravings, Pearson was nevertheless very much in earnest. Teufelsdröckh preached redemption in work, as did Carlyle subsequently. Pearson would suffer intensely from his inability to find a mission for which to labor. He looked to philosophy, and above all to German idealism, for a sense of meaning and purpose.

A Philosophical Wrangler

By the summer of 1877, when the paper trail of Pearson's life resumes, he was reading seriously in philosophical literature. At about this time he wrote in his commonplace book that "Goethe's Faust & Wilhelm Meister and Shelley Poems have been the greatest revelations to me of anything I have read." Although the archives reveal very little about the circumstances of his reading in those years, we can surmise that his encounters with literature and political philosophy were guided by Oscar Browning. For Rousseau this can be documented, and also for Goethe. Browning particularly admired the great German, and a few years later would write a long entry on Goethe for the ninth edition of the *Encyclopaedia Britannica*. There were reasons to doubt his scholarly acumen, and Pearson would eventually treat him as almost an object of derision,[39] but in 1876–77 the two were very close.

Browning had a long-established habit of traveling during the summer with a favorite student and a John Murray guidebook. There were suspicions, which cannot be entirely discounted, that his dismissal from Eton was occasioned by relationships with his boys that went beyond the bounds of propriety, as in later years they almost certainly did.[40] Such rumors did

[38] Ashton, *German Idea,* 75.

[39] Somervell, who was among the first to take honors in the modern history Tripos, was also distinctly unimpressed by Browning, at least in retrospect; see *Autobiography,* 67–70.

[40] The pretext for his dismissal, which became a cause célèbre, was a technical violation of rules, a late application for permission to tutor more than forty students. The real reason may have been the one offered by Browning himself, a disagreement with the then headmaster about educational reform. Browning always insisted (too much?) on the need for guarding the morality of his boys. But see Anstruther, *Oscar Browning,* 5–11. Virginia Woolf, in *Three Guineas,* implied a relation between his misogyny and homosexual pedophilia.

Figure 4. Karl Pearson. Can he ever be happy? (Courtesy of UCL)

not prevent him from forming close and personal friendships with students at King's after he was transplanted there, and he was very fond of Pearson. In June 1877, the two set off together for a tour of the Continent. Pearson informed his mother in his first letter home, from Lucerne, that he and Browning had been reading *Faust* together on the train.

The journey was a fine opportunity for the lad to cultivate his taste, or at least to articulate it. Grandiose Paris, as reconstructed by Baron Haussmann, was disappointing: "Everything looked too new, no old houses & streets." In Switzerland, he adored the mountains, glaciers, cliffs, and waterfalls "beyond anything I could think possible," although the thunder in Andermatt did not echo so resonantly through the mountains as he had imagined it. This was made up on Monte Ceneri, looking down on Lago Maggiore: "As we reached the top a most violent thunderstorm hid the lake from sight. I cannot possibly describe the scene." In Como, he was sent into "raptures" by his first Italian cathedral, and the "dress & face of the peasants" he thought "beyond description for their beauty." "Switzerland is grand, but Italy is simply sublime." Unfortunately the weather was too hot, so back they went to St. Moritz, where he was enchanted by the "vaulted passages & staircases leading everywhere & nowhere" in his hotel, and then through Innsbruck to Munich.[41] Neither his reading nor his taste in architecture and landscapes bespeaks a sober rationalist.

No later than July of the same year he started his Commonplace Book, with its dreary introspection and unconvincing irony. At Cambridge in 1878 he began reading systematically in philosophy, especially German philosophy. Browning may have helped to get him started. Pearson took as guides to his philosophical reading two German histories of philosophy, by Kuno Fischer and Eduard Zeller, of which the latter was a favorite of Browning's.[42] There is no indication that he received serious philosophical instruction at Cambridge. He seems rather to have investigated the field on his own, in close association with other students, especially Robert Parker.

Pearson and Parker were part of a tennis foursome at King's, along with John Lawrence Green and Edwin Cooper Perry. Tennis proved to be a philosophical game. Presumably there were conversations during term at college. In the summer of 1878 they materialized as documents, when Pearson began corresponding about German philosophy with Parker and Green. Parker, an Etonian and son of a reverend, entered King's in 1876, the year after Pearson. He subsequently took honors in the classical Tripos

[41] KP letters to Fanny P, undated, June (and July?) 1877. Browning recalled the trip, which he dated incorrectly to 1878, in his *Memories,* 267–268. In Como, he explained, "Pearson suffered severely from the heat, and we had to go into the Engadine."

[42] Browning, *Memories,* 227.

in 1880, bracketed fifth, and went on to a successful career as legal counsel and then judge, rising to lord of appeal and to the Privy Council. Eventually he fell heir to the family baronetcy, and took a prominent role in the House of Lords during the First World War.[43] Pearson's friendship with him at King's quickly developed an important personal as well as intellectual dimension, yet its intensity in these early years derived from a shared appreciation of German literature and philosophy, driven mainly by Pearson's need for a philosophical listener. Parker, less radical in his politics and more restrained in his metaphysics, was more often the recipient than the author of urgent philosophical explorations. Still, he willingly joined this journey of discovery through a landscape of Teutonic metaphysical idealism, which would have seemed lonelier to a pair of King's undergraduates in 1878 than it appears in retrospect. In fact, for most of the next decade, Pearson would move largely in Germanophile circles.

The contrast between the commercial and somewhat philistine Wilcoxes and the highly cultured Schlegels in E. M. Forster's 1910 novel, *Howard's End*, gives some idea of what German culture was coming to mean already among the late Victorians. Goethe's early reputation among the English for immorality was by then a distant memory, and he had come to be deeply admired by earnest writers and intellectuals of diverse political views. Many endorsed German biblical criticism as the basis of a heroic search for truth and a sacrifice of the comforts of blind faith. In the 1870s, a German-inspired philosophical idealism grew to prominence, especially at Oxford. It was strongly opposed to the individualistic utilitarianism of Jeremy Bentham and John Stuart Mill, and to the old liberalism that aimed to minimize the role of the state. German philosophy was redolent of higher ideals, of self-sacrifice and improvement. Benjamin Jowett, reformer and then master of Balliol College, fought particularly for this ethic of service and against the pursuit of commercial gain. In his edition with commentaries of Plato's dialogues, he introduced also a more modern ally, G.W.F. Hegel, the "true countryman" of Goethe and Schiller and deadly critic of Locke and Hume.

This new moral idealism did not, to be sure, look only to Germany. Jean-Jacques Rousseau's *Social Contract* attained the status of a classic in these years, and Auguste Comte's religion of humanity was applauded by a generation of hopeful elite reformers, who took upon themselves the burden of relieving the condition of the laboring poor. The now-unified German state was coming to be seen as the site of a promising social experiment, and German idealism, which for much of the century had been held tantamount to atheism, gained favor in the context of the revival of

[43] Sumner, "Parker."

classical education on the Greek model. Increasingly, idealistic philosophy gained currency as a promising basis for a metaphysical quasi-religion.[44] Pearson and Parker, joining an intense philosophical quest with a growing social concern, looked to the Germans for guidance.

Pearson's turn to philosophy coincided not only with religious doubts, but also with a reconsideration of his professional ambitions. He had become disillusioned with the legal career for which he thought himself destined, and may well have decided that the price to be senior wrangler was too high. In a sharply worded letter at the beginning of a new year, 1878, he told his father that he was not seeking a degree for "getting on in the world," but wished only to earn enough to assure his independence. "I could not work, and would not, as you have done," but would prefer £300 and time to follow hobbies to £6000 and "grind my whole life out."[45]

By March, Pearson was beginning to regard himself as a disciple of Spinoza, who "at least offers a satisfactory, if some-what deep solution of the great question [i.e., personal immortality]. His criticism of the Divine Law as exhibited in the Bible is splendid & carefully distinguishes the kernel from the husk in that somewhat confusing book."[46] In the spring, he reported to Parker and unnamed others on the importance of the three reverences in *Wilhelm Meister's Wanderjahre*. In September their correspondence hit upon theosophy with Pearson seemingly more enthused than Parker about a philosophy that regarded the universe "as a thought of God."[47] This, too, led to Spinoza, whom Pearson here understood as drawing a sharp line between feeling and intellect and consigning religion to the domain of feelings. His tennis companion Lawrence Green, who was to become a man of the cloth, argued that this reading originated with Spinoza's German interpreters and not with the great philosopher himself. Green pressed, in the name of Hegel, a more radical idealism that would allow a personal spirit to survive the death of the body, while Pearson held that the soul was absorbed into the "individuality of the universe."[48]

[44] Ashton, *German Idea,* 23; Den Otter, *British Idealism and Social Explanation;* Turner, *Greek Heritage in Victorian Britain,* 418; Newsome, *Victorian World Picture,* 170.

[45] KP to William P, 4 Jan. 1878, Hacker Papers, Box 8. He also said he would rather be a recluse than a family man.

[46] KP to Fanny P, 29 March 1878, Pearson Papers 11/3.

[47] Only Parker's letters on these matters survive: Parker to KP, June 1878 and 2 Sept. 1878, Pearson Papers 780. We have, however, Pearson's notes on the three reverences (reverence for what is above us, "symbolized by old Jewish faith," for what is around us, "the religion of Wisdom," and for what is beneath us, "symbolized by Christianity") in Pearson Papers 11/6. As for theosophy, apparently written as "Neosophie" in Pearson's letter, Madame Blavatsky's *Isis Unveiled* was published in 1877.

[48] Lawrence Green to KP, 15 Aug. 1878 and undated, fall or winter 1878–79, Pearson Papers 706/3.

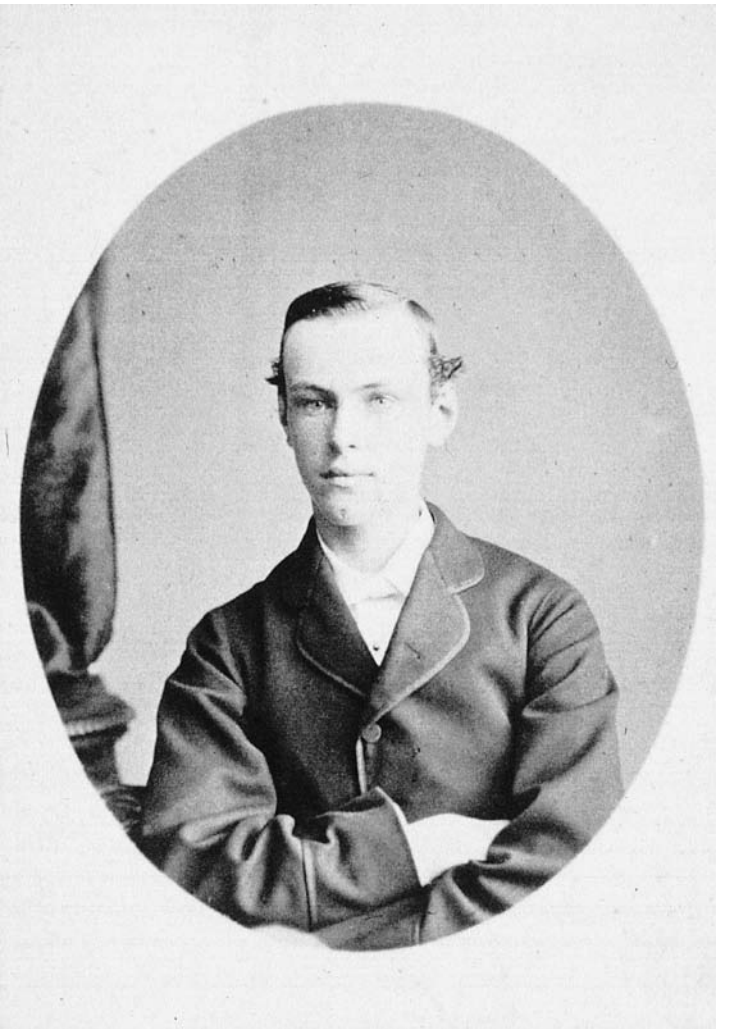

Figure 5. Robert Parker. Philosophical partner (Courtesy of UCL)

It appears from this correspondence that Pearson and Parker first encountered Hegel in early 1878 in Jowett's commentaries on Plato. Pearson later formed the habit of sneering at Balliol men, and perhaps implicitly also at Green, for what he saw as rearguard efforts to make Hegel a support of Christianity and for the Oxford neglect of science. Yet the evanescence of individuality, and particularly his own, distressed him

throughout his life. His turn to radical idealism the next year meant an exaltation of the self, which took him even to the borders of solipsism. He pondered what Jowett called Hegel's "faith or conviction, that God is immanent in the world,—within the sphere of human mind, and not beyond it."[49] An English admirer of German literature and philosophy was almost necessarily drawn also to Carlyle. Pearson's delight with *Sartor Resartus* reveals much about his frame of mind during his last year at Cambridge:

> I have not since Faust II read anything that so suited my cravings. You are always blaming me for my love of the ideal, even when it has no application to the practical & my brother does the same, but somehow, since all my religious dogmatic faith fell to the ground, I feel I can only be happy by adding a mystic ideality to everything & looking at everything from a religious point of view. This does not add & rather impedes my practical action but it supplies a want I feel. It is this spirit of the ideal which Carlyle tries to cast over everything & which delights me so.[50]

By comparison to the urgency of his metaphysical quest, natural science occupied Pearson only a little during his last university year. Experimental science had but a modest role in undergraduate study at Cambridge in Pearson's day, and still less at King's than at other colleges. Toward the end of 1878, however, he reacted strongly to a scientific debate between Rudolf Virchow and Ernst Haeckel. At the 1877 meeting of the Congress of German Scientists and Physicians, Haeckel had argued for reorienting education around an evolutionary monism, which, he proposed, could bridge the divide between the two great competing modes of instruction, the classical-historical and the exact mathematical. Virchow, his former teacher, replied a few days later that the Darwinian ideas of human descent and of the spontaneous appearance of life were mere hypotheses, and dangerous ones, since they had been appropriated by the radical Social Democrats. Coming from this accomplished scientist and liberal politician, no apologist for Christianity, Virchow's reply was lauded by the conservative German press as an impartial critique of Darwinism. It was also picked up in London by the *Times,* which interspersed long translated excerpts with fawning commentary. The *Times* in turn was answered by William Kingdon Clifford and then John Tyndall, who defended Darwinian naturalism in that instantly successful new review, *The Nineteenth Century.* The scientific journal *Nature,* which had published the original exchange in the fall of 1877, printed long translated extracts from Haeckel's rejoinder in December 1878.[51]

[49] Benjamin Jowett, ed. and trans., *The Dialogues of Plato,* 2d ed., 5 vols., vol. 4 (Oxford: Clarendon Press, 1875), "Introduction to Plato's 'Sophist,' " 409–424, on 424.

[50] KP to Parker, 31 Aug. 1878.

[51] Ernst Haeckel, "The Present Position of Evolution Theory," *Nature,* 16 (4 Oct. 1877), 492–496; Rudolf Virchow, "The Liberty of Science in the Modern State," *Nature,* 17

Pearson's comments on the debate, written within days of the appearance of this 1878 summary in *Nature,* are the first indication of a serious engagement with science to appear in his letters. Straightaway he faced the question of the limits of knowledge. Clifford had defended science as a combination of bold hypothesis and critical analysis, arguing that evolution should be taught in the schools—not as dogma, but concretely, with its evidence and its limitations. For him, the scientific attitude was more important than any particular doctrine. Tyndall, more conservatively, held that evolution was not yet suited for the classroom, and should "bide its time" until it was better understood. He was, however, no more inclined than Clifford to exclude hypothesis from science. "I call a theory a principle or conception of the mind which accounts for observed facts, and which helps us to look for and predict facts not yet observed."

Throughout these exchanges, arguments for the unavoidable imperfection and partly subjective character of knowledge were used by both sides. Haeckel, a bold scientific metaphysician who fashioned the soul out of carbon, countered Virchow with the argument that his demand for perfect certainty would exclude all of biology, chemistry, and, indeed, physics from science. After all, what do we know of the true nature of atom, force, electric fluid, and ether? Even mathematics has aspects that cannot be proven, such as the fourth dimension. One of his unfriendly English reviewers, Charles Elam, conceded that the "essential nature" of things remains unknowable, but sought to discredit evolution by contrasting it to the solid phenomenal knowledge of real science. This "shibboleth of modern enlightenment," evolution, failed Elam's test of a valid hypothesis, that it must function as "an aid to thought or classification." Pearson was initially disheartened by this talk of the limits of knowledge. What good was solid science if it could shed no light on the really vital questions that obsessed him? But he disliked extravagant theories. Perhaps he was impressed by Virchow's distinction between firm objective facts and subjective fantasy, for he pointedly refused to credit Haeckel's speculations as science.[52]

Pearson's reaction was conditioned also by his reading, probably only a few weeks earlier, of W. H. Mallock's *The New Republic; or, Culture, Faith,*

(22 Nov., 29 Nov., 6 Dec. 1877), 72–74, 92–94, 111–113; Anon., "Natural Science and Free Thought," *The Times* (London), 29 Jan. 1878, 4; W. K. Clifford, "Virchow on the Teaching of Science," *Nineteenth Century,* 3 (April 1878), 712–732; John Tyndall, "Virchow and Evolution," *Nineteenth Century,* 4 (Nov. 1878), 809–833.

[52] Clifford, "Virchow on the Teaching of Science"; Tyndall, "Virchow and Evolution"; Anon., "Haeckel on the Liberty of Science and Teaching," *Nature,* 19 (5 Dec. and 12 Dec. 1878), 113–115, 135–137; Charles Elam, "Haeckel and Virchow: The Evolution Controversy in Germany," *Contemporary Review,* 35 (Oct. 1878), 540–569, on 554–555, 563. The cited remarks were inspired by the German edition of Haeckel's rejoinder, later published in English translation with a prefatory note by T. H. Huxley as *Freedom in Science and Teaching* (London: C. Kegan Paul, 1879), see esp. chap. 5. For Pearson's reaction, see the following paragraphs.

and Philosophy in an English Country House. The genre became Mallock's specialty, a fictitious conversation among prominent British thinkers or statesmen, always under pseudonyms. Pearson joined the game of matching Mallock's characters with their prototypes, who included T. H. Huxley, Tyndall, Clifford, John Ruskin, Carlyle, Jowett, Matthew Arnold, and E. B. Pusey. Clifford's alter ego, Saunders, played the role of scientific fool, rejoicing that science will soon destroy religion and poetry, and applauding the subordination of "all the vaguer and more lawless sentiments to the solid guidance of economical considerations." He exalts progress as the aim of life, explaining that "progress is such improvement as can be verified by statistics, just as education is such knowledge as can be tested by examinations."[53] Pearson, joining the ridicule, called Haeckel "the German Clifford" for his combination of naïve faith in human knowledge with a vague panpsychic materialism. In response to Parker, who disliked the social inequality implied by Haeckel's evolutionism and linked it to Goethe rather than Darwin, Pearson advised: "Pray do not write & ask me the meaning of any scientific or philosophic terms in it, you think you do not understand. I do not possess the knowledge of the cell-soul or the soul-of-the-cells & the idea of the 'plastidule' is maddening."[54]

He went on to complain of the German disdain for empiricism, which could find no place under the rubric of a dogmatic metaphysics. But he was far from content with what science might hope to acquire empirically. He lamented to his brother:

> I have just read Haeckel's reply to Virchow's Munich speech. It is most amusing, a regular German Saunders or Clifford. The old battle seems opening again, 'Science versus Religion'. [P. G.] Tait and Balfour Stewart have just published a sequel to the 'Unseen Universe', and our friend Clerk-Maxwell has descended into the arena and written, in a matter worthy of the 'broad-browed V[irchow]': 'The progress of physical science has added nothing to what has already been known about the physical consequences of death and has tended to shew that our personality, with respect to its nature as well as to its destiny, lies beyond range of science.' [Here Pearson cited Francis Bacon making a similar point about scientific limits.] . . . That is to say, after 300 years of patient "research", science is said not to have approached any nearer the great question. What a satire on all our modern thought! No wonder that the doctrine of 'Ignorabimus' is preached, if our leading physicists talk thus. No wonder such enthusiasts as Haeckel and Clifford use strong language, and demand that the

[53] Arthur P to KP, 3 Dec. 1878, Hacker Papers, Box 8; W. H. Mallock, *The New Republic* (New York: Scribner and Welford, "new edition," 1878), 218, 46, 22–23.

[54] Parker to KP, 22 Dec. 1878; KP to Parker, 19 Dec. 1878, Pearson Papers 922.

doctrines of evolution, which their opponents say are those of revolution, shall be taught in our schools.[55]

This passage shows a definite interest in broader issues of science, and unmistakable dissatisfaction with its incapacity to address the issue of higher purpose and personal destiny. He rejected Tait and Stewart's incorporation of science into a Christian apologetic, as he disapproved Haeckel's bombastic anti-Christian scientific metaphysics. His final sentence suggests that, at the age of twenty-one, this future champion of rigorous Darwinism may have agreed with Virchow on the speculative character of biological evolution. But his unhappiness with Emil Du Bois-Reymond's doctrine of *Ignorabimus,* that there are some things we can never know, came straight out of Haeckel, who criticized Virchow's binding up of science (Haeckel called it *Restringamur*) as still more confining. Here, Pearson refused to concede that any significant questions were necessarily beyond the reach of science. In later writings, even as he forcefully denied that science can get to the essence of things, he criticized Du Bois-Reymond quite specifically on this point. Evidently he held out hope, despite his gloom, that science could be of help in his search for religious or philosophical meaning.

The Mathematical Tripos

Pearson's increasingly intense exploration of philosophical and religious questions in 1878 was all the more remarkable because he was about to compete in the Mathematical Tripos. Although it had long been possible to take honors at Cambridge in classics, and by Pearson's time in an expanding array of other fields of knowledge, there was no ambiguity about which carried the most prestige. Cambridge was the site of a particular, somewhat outdated variety of mathematics, perpetuated by the remarkable status of this famous examination. Having long been dominated by Newtonian geometry, after midcentury it was converted to analysis, though still with a strongly physicalist orientation. The problems tended to be elaborate, even baroque, involving solutions by brute force more than cunning insight. Wranglers were expected to give mathematical solutions to complicated mechanical problems of pulleys, inclined planes, and inelastic rolling rings.

[55] KP to Arthur P, 22 Dec. 1878, Pearson Papers 11/3. This passage was inspired by James Clerk Maxwell's review of Balfour Stewart and P. G. Tait, *Paradoxical Philosophy* (sequel to their *Unseen Universe*) in *Nature,* 19, 19 Dec. 1878, 141–143, quotation abridged from p. 143; *Ignorabimus* ("we shall never know") refers to Emil Du Bois-Reymond, *Ueber die Grenzen des Naturerkennens* (1872), which Maxwell's review also mentions. On Tait and Stewart, see Heimann, "Unseen Universe."

There were complaints throughout the century about the form of study that the Tripos encouraged. Pearson, an outspoken critic in the 1880s, praised the system in his late essay on "Old Tripos Days," but his defense amounted to the claim that he had been able to secure a superb and balanced education despite its rigors. Most of the other candidates, he let on, were dull and narrow, fixated on this examination result and willing to sacrifice all else. Candidates were prepared for the Tripos not by university lectures or college teaching, but by coaches, the Tripos "coach" being the prototype of a profession now associated almost exclusively with physical athleticism. Pearson had the benefit of coaching by Routh, whose charges took most of the top honors for two decades. The Tripos encouraged, as Pearson noted, an approach to mathematics in terms of problem-solving rather than strict proofs, and this had definite advantages for fields such as mathematical physics. Still, modern scholarship has tended to support the critics in most respects. The candidates worked under severe time pressure, and to do well it was necessary to solve problems very quickly. A high wrangler had to commit a great deal of material to memory so he could reproduce it quickly in the examination room. It also took great stamina to hold up for several consecutive days of testing, in a high-ceilinged room that could be freezing cold in January.[56]

The Tripos in the late nineteenth century had something like the status of the Oxford-Cambridge boat race. It would probably have been televised had the technology been available. Beginning on the first Monday after December 29, the students were examined from 9:00 A.M. until noon and 1:30 to 4:00 P.M. for four days, and then after a week for five more days. Only those who performed at a sufficiently high level on the more elementary problems in the first three days were allowed to continue to the advanced topics of the second week. Those who took honors were divided into wranglers, senior optimes, and junior optimes.[57] A great tumult surrounded the announcement of the winners at Senate House. The top wranglers, especially the senior, had their pictures next day in the newspapers, and then received dozens or hundreds of congratulatory telegrams. Many college fellowships were offered based on Tripos rankings.

One of the most celebrated of all Tripos announcements took place a decade after Pearson's competition, when the highest score was secured by a woman, Philippa Fawcett, daughter of a noted champion of women's rights and of a Cambridge economist. Since women were not allowed to take degrees or honors, her position was designated as "above the senior wrangler." Her mother's autobiography describes the occasion, which was

[56] Warwick, "Exercising the Student Body"; Warwick, "Mathematical World on Paper"; Weintraub, *How Economics Became a Mathematical Science,* 9–25.

[57] *Student's Guide to Cambridge,* 104–131.

celebrated as a triumph for women. Pearson, himself a spokesman for women of some standing, taught mathematics to Fawcett in London before she went to Cambridge, and then advised her mother on coaches. The daughter replied to his congratulations with a humility that now appears tragic. "Thank you very much for your kind letter and for the hope which you express that I may be able in the future to do some scientific work. But I am sure you will agree with me that the attainment of a high place in the Tripos is no evidence of the possession of power to do original work. I can only regret that the accident of being the first woman senior wrangler did not happen to some one who was capable of such work."[58]

Whatever Pearson may have believed in 1890 about the significance of a Tripos result, he could not take a detached view of it in 1879. To be third wrangler was no modest achievement, and Routh informed him that the top three were very close. Yet he was almost despondent about the result, and he received more condolences than congratulations. Everyone was disappointed by his performance, he told his father. John Taylor, his tutor from 1875, explained that "nervousness," no doubt, "had spoiled the Tripos." Pearson declared that nobody should expect him to do better on the Smith's Prize examination, a less celebrated competition that provided, however, a better index of fitness for research. He was, he explained, out of exam form, "and there is no doubt that Allen & Walker are better men."[59]

It is a stunning tribute to the psychological force of a meritocratic examination result that Pearson seems to have lost faith in his own capacity to do physics at the level to which he aspired. This is remarkable not only because of the extraordinary force of his personality and his striking independence of conventions, but also because in his last two years, at least, he had clearly not devoted himself wholeheartedly to Tripos preparation. His later recollections of far-flung intellectual adventures at Cambridge give every appearance of being accurate, even if the lighthearted self-assurance he read back into those years was certainly not. Some subsequent testimonials, as by the King's historian G. W. Prothero in 1881, made the obvious point that his ranking, while strong, "might have been higher still had he not wisely preferred a more general course of reading and a wider culture to the limited range required for the Tripos."[60] His letter decrying narrow careerism indicated his determination not to put his all into the Tripos,

[58] Philippa Fawcett to KP, 11 June 1890, Pearson Papers 687/9; Millicent Garrett Fawcett, *What I Remember* (1925; London: Hyperion Press, 1976), 137–145 (she does not mention Pearson); [George Udny Yule], "Professor Karl Pearson" (letter to the *Times*), 30 April 1936, 16b, recalls Philippa Fawcett's presence in one of Pearson's University College courses.

[59] KP to William P, 26 Jan. 1879, and John Taylor to William P, 24 Jan. 1879, both in Pearson Papers 11/3.

[60] Testimonial by G. W. Prothero in Pearson's printed application to Owens College, Manchester, May 1881, Pearson Papers 11/9.

and in the months leading up to the examination he was reading philosophy with ever greater intensity.

He must have contemplated the possibility of a career in physics while at Cambridge, and he continued to do so throughout the period that followed, but his expectation of becoming a mediocrity in science weighed against this. In the first volume of his biography of Galton, written in 1914, he called the Tripos "a pernicious examination system . . . which ruined the College career of men who distinguished themselves in later life." This "indictment" applied specifically to Galton, who had broken down under the pressure of Tripos preparation, and not in any obvious way to a third wrangler, yet the autobiographical overtones are hard to miss. Galton's failure was not due to mathematics alone, Pearson summed up, but to "the impossible attempt to combine those studies with a very wide range of other interests and occupations."[61]

Whatever career he might eventually pursue, he could afford to wait. Third wrangler, as he appreciated, was good enough to gain him a fellowship in a year or two, which it did. And there were more pressing matters: to broaden his education and to find his way to a more satisfactory philosophical or religious standpoint at that mecca of science and scholarship, the German university. Earlier in 1878 he had acquired "the standard history of German philosophy," presumably Kuno Fischer's. In October he corresponded with Fischer about this work. In January 1879, after the Tripos result, he informed his father that he had been reading philosophy and intended to go to Heidelberg in the spring to study with Fischer, to compensate for what he then criticized as the narrowness of the Cambridge system, and to improve his German. He added, disingenuously, that this would not delay by much his legal career.[62] In fact, he wavered in this period as much about career as about metaphysics, and in Heidelberg he told acquaintances of his plan to pursue a career in mathematical physics. Pearson went to Germany in order to resolve his abundant doubts, in search of a calling and a basis for truth.[63]

[61] Pearson, *Life of Galton,* vol. 1, 179, 194.

[62] KP to Fanny P. Helga Hacker guesses at a date of May 1878 (Hacker Papers, Box 8); Kuno Fischer to KP, 23 Oct. 1878, and KP to William P, 26 Jan. 1879, both in Pearson Papers 11/3.

[63] After the Tripos he began doing experimental work in an engineering laboratory (KP to Arthur P, 16 Feb. 1879, Hacker Papers, Box 8), and he told at least one of his German friends in Göttingen of his intention to become a physicist. See Julius Eisenach to KP, 31 Nov. 1879, Pearson Papers 682/5, which refers to his "Wechsel vom Physiker zum Juristen" while in Berlin.

CHAPTER THREE

Apostle of Renunciation:

A NEW WERTHER

> But whereas I felt relieved and serene for having transformed reality into poetry, my friends were misled into thinking that poetry must be transformed into reality.
>
> —J. W. von Goethe (on *Werther*) in *Poetry and Truth*

"TWENTY-THREE and nothing done for immortality," complained the immortal Schiller. Karl Pearson, in the same spirit, returned from his *Wanderjahre* in Germany and composed his fictionalized autobiography, *The New Werther,* looking within to define the plight of his generation. It was a self-conscious work of romantic effusion, of longing to embrace the world, to get behind its masks, and to find for himself a purpose. That is, it laid out some of the enduring issues of his scientific life. As he would write later of Francis Galton: "The five years which follow most men's University careers are the most developmental of their lives."[1]

For Pearson, this formative period from 1879 to 1884 was defined mainly by philosophical, literary, historical, and political efforts. His earliest writing reflected quite specifically his effort to find a way through the maze of philosophical and religious questions that now oppressed him. To this end he studied German romantic philosophy with great hope, and adopted a form of metaphysical idealism that would form the basis of his mature philosophy of science. Spinoza he read with an admiration that would endure, especially for his teachings on the ethical relationship of man to God. An increasingly bitter recognition of social injustice inspired Pearson to study radical social and economic writings, and perhaps, as he later claimed, to give lectures on Marx and Ferdinand Lassalle to workingmen's clubs.[2] By 1883, when he lectured on "The Ethic of Freethought," he was able to synthesize his social discontent with a naturalized religious doctrine. By then, too, he had largely renounced his metaphysical quest in

[1] Pearson, *Life of Francis Galton,* vol. 1, v.

[2] As he claimed in *Speeches Delivered at a Dinner* (1934). The only contemporary evidence I find of this is in KP to Conway, 22 Oct. 1881, where he refers to a request from a working-men's club for lectures, and proposes to "give them one on Lassalle later on."

favor of the bold pursuit of empirical knowledge to the end of improving the lot of humanity, and especially of the downtrodden. He made himself an apostle of scientific enthusiasm, as a necessary guide and balance to political enthusiasm. Social activism without unbiased knowledge would inevitably go wrong.

Much of this chapter concerns Pearson's social and philosophical writings, viewed to a large degree through the prism of literature. Especially as a young man, he believed in the power of poetry and fiction. Although he probably never imagined making his living as a writer, from about 1877 to 1881 he entertained grand literary aspirations. These place him rather outside the clustering of personality types one commonly associates with statistics. His first published book contained long poetic extracts of his own composition, and his second was written entirely in verse. His talent, though not to be despised, fell far short of his aims, and he proceeded in a way that almost assured failure. He did not seek out criticism or draw inspiration from contemporary poetry, but was largely isolated and incorrigibly unfashionable. He aspired in his literary works to lay bare the dilemmas of his age, as revealed in his own spiritual struggles; to contribute to its regeneration, and to his. Terrified of failure, at least where so much personal revelation was at issue, he withheld his name from these youthful writings and cloaked his ambition in unassuming earnestness. Any reader who looked inside the cover of Pearson's *New Werther* was greeted with flamboyant humility. "There is only one excuse for publishing the following letters, namely, they truly image the mind of him who has written them. . . . They are beneath the notice of the critic."[3]

Pearson's rationale is the premise of this chapter. In these youthful writings we encounter a different aspect of the great quantifier. Just how "truly" they "image" this mind is another question. He lived to a remarkable degree on the border between truth and fiction, revelation and disguise, identity and plurality. As Goethe's Wilhelm Meister used theater to cultivate different aspects of his personality, Pearson expressed himself through multiple genres, refusing the confinement of self implied by narrow specialization. He wanted badly to hold these diverse roles together, and displayed remarkable consistency across the many, seemingly incompatible, genres of intellectual activity that he made his own, even if they reveal different patterns of light and shade. In literary efforts he often gave direct expression to his intense emotionality. Having taken possession of the key, we can recognize the passions written into his perspective on other topics as well, even mathematics. He was reluctant, however, to express these directly. It was easier to tell the truth through fiction.

[3] "Loki," *The New Werther,* iii.

Pearsonian Fictions

Pearson read serious literature, and discussed it with family and friends, throughout his life. He was formed through an engagement with literature as well as religion, philosophy, politics, and science. Human life, a bildungsroman, naturally invited literary expression. He felt he was wrestling with the great questions of the age, and that his experience should have value for others. A bit solipsistic, as he himself understood, he was given to self-dramatization. His strong inclination to find larger significance in his own life, and to offer his own dramatic story to the world, was checked by fear that he was taking himself too seriously, and that his very personal revelations might be ridiculed. He chose for his youthful memoirs the literary form of an epistolary novel, which allowed for uninhibited confession while confining every psychological disclosure to the particular moment when the letter was written. Then, to disguise his overwrought revelations, perhaps chiefly from himself, he fictionalized it by inserting what he hoped would be recognized as "gush." On the cover he placed a name from Norse mythology, the subversive and protean Loki, whom the transplanted Oxford philologist and folklorist Max Müller had characterized as "a mischievous person" but "not a fiend."[4] Despite these clues, his few readers were unable to construe the work as light and playful. They understood it, correctly, as the outpouring of an anguished soul. Oscar Wilde supplied the correct principle for interpreting Pearson's literary persona: "Man is least himself when he talks in his own person. Give him a mask and he will tell you the truth."[5]

Yet Pearson was deeply sincere, as an author and also as a reader of fiction. He did not insist strictly on realism, but appreciated symbolic language, and he could be particularly moved by epic forms and epic heroes. Still, he looked to literature for deep truth, involving, for example, "the true relationship between a variety of emotions." In his more theoretical moments, he applied to it his view of the function of science, a caricature perhaps of George Eliot's defense of realist fiction, arguing that its proper role was to provide a concise summary of experience. Only a scientific interpretation, it seems, can "satisfy the aesthetic judgment."[6] In discussing individual works, he did not rely on handy philosophical formulas. He

[4] Max Müller, *Chips from a German Workshop,* vol. 2: *Essays on Mythology, Traditions, and Customs* (London: Longmans, Green, 1867), 235. Pearson mentions this line of Müller's in KP to Conway, 12 Dec. 1880, Pearson Papers 910. On Loki, and on *The New Werther* generally, see Levine, *Dying to Know,* 237 and chap. 10.

[5] Oscar Wilde, "The Critic as Artist" (1890–91), quoted in Beckson, *London in the 1890s.*

[6] KP comment on a debate regarding "the influence of realism in literature and art on morality," Pearson Papers 35, undated, ca. 1900–5; Pearson, *Grammar of Science,* 42–43.

looked to novels for social as well as psychological insight into the development of personality and the influence of characters on one another. He disliked those whose protagonists lacked depth or conscience. And he instinctively supposed that characters were drawn from personal experience, even autobiographically. He and Shaw, for example, discussed the latter's marriage in reference to the plot of *The Philanderer.* "I hope for your sake, your wife's sake and her own sake that the original of Julia is dead, or she may yet be revenged for the cash you have made out of your passions," Pearson concluded.[7]

Pearson had many reasons to deny the seriousness and fidelity to life of his gushing novel, *The New Werther.* There was the immorality, by conventional standards, of the author's imagined relationship with the invented recipient of his letters. There were unkind digs at an unnamed Oscar Browning, whose European trip with the protagonist is recalled in the text. "But I remembered him who was then with me, and to whom I looked with all the admiration of a boy, fancying I had found inexhaustible springs of mind and boundless intellectual aid, where afterwards I was to discover the false prophet of a sham culture, a paper-knife in human form."[8] Above all, there was the risk that readers would find it shallow, trivial, or ridiculous (which they generally did not), or would charge that a self-absorbed author had made bad literature out of a sympathetic life (which some did).

So, in his correspondence with those who were entrusted with the secret of authorship, he made light of his little story. To his King's College mathematical friend, William Herrick Macaulay, he explained that "in April two friends (unnameable) & myself used to meet at 1 o'clock A.M. and being an impecunious trinity determined to write a book in the genuine gush style. The whole was completed in a fortnight." He added: "*you must on no account reveal to any one my connection with it,* as such revelation would be simply damning to my reputation whatever that may be. So remember *absolute secrecy.*" The other persons of this trinity were Robert Parker and William Conway. Conway, the first to flee the enterprise, received the following assessment of it from Pearson just before publication: "All that is mine is thine that is to say if you care to take a share of a £40 to £80 deficit you are welcome. . . . I am dreadfully afraid that K[egan] P[aul] & Co may come down on me for further sums before producing this damned folly of mine & I wish I was well out of the whole thing." Kegan Paul published the volume on commission, estimating charges of £21 to print five hundred

[7] Shaw to KP, 4 July 1898, Pearson Papers 853; KP to Shaw, 5 July 1898, in Shaw Papers 50513 f196, British Library. *The Philanderer,* written in 1893, was published in 1898.

[8] *New Werther,* 89–90. "The Paper-Knife" was the title of a column on books in the *Cambridge Review* and here implied perhaps an indiscriminate eclecticism.

copies, £10 or £15 for advertising, about £6 for binding, plus a publisher's fee of £5/5 and postage for review copies and the like.[9] After the critics began to write, most of them sober and unfavorable, Pearson complained to Conway of their failure to perceive the significance of Loki, the jokester. "I wish they had seen Parker & I roaring over the first letters." When Browning found the book in February, and recognized himself as an occasion for disappointment and the apostle of sham, Pearson denied any resemblance to reality. "Do you really think the 'N.W.' is biographical and that the author has therein depicted his friends?"[10]

The answer to this question, based on all the evidence, would have to be "yes." The book, while deliberately exaggerated, was anything but a joke, and if indeed he wrote it in two weeks, this was by incorporating thoughts and sometimes long passages from his notebooks of the previous two years. Pearson's third Commonplace Book, most or all of it written while he was studying in Heidelberg in the spring of 1879, includes two earlier efforts to make literature of his recent struggles. The first is a composition in rhyming verse about a troubled Englishman who ventures to Germany. It leaves off after the forty stanzas of Canto I when the hero, disappointed by a woman, flees Heidelberg to Italy. Helga Hacker, Pearson's younger daughter and annotator of his manuscripts, called this verse the "song of Arthur." I will refer to it as Pearson's *Urwerther.* The second, a draft of the first chapter of the *New Werther,* was probably written not long after the *Urwerther,* and almost certainly before he returned to England and began making light of his sufferings with Parker and Conway. He incorporated it with few deletions into the book, although about a third of the published first chapter is new material.[11]

Like the book, the draft chapter is in the form of a letter to "Ethel." The subsequent additions were intended mainly to distance it from its author, through ridiculous and uninhibited gushing. They exaggerated still further the draft chapter's tendencies to elevate feeling over reason—which for Pearson was by no means merely insincere. He deflated one of the more florid passages with a joke: "Man is what his time, his nation, and his liver

[9] KP to Conway, undated 1880 and 12 Dec. 1880. These figures come from the Kegan Paul "Publication Book" in the microfilmed archives of the publisher produced by Chadwick-Healey Ltd, reel 2. In 1886, 274 of the original 500 copies were "sold as waste." Almost half of Kegan Paul's books in these years were published on commission. Howsam, "Forgotten Victorians; Howsam, *Kegan Paul, A Victorian Imprint,* chap. 3. In January 1886, Kegan Paul closed the account; Kegan Paul & Co to KP, 18 Jan 1886, Pearson Papers 732/7.

[10] Oscar Browning to Conway (with whom Pearson was then sharing rooms in London), 28 Feb. 1881, Pearson Papers 645/4, and KP to Browning, 1 March 1881, Brownings Papers, King's College Archives.

[11] Pearson Commonplace Book III, Pearson Papers 11/4.

make him." He also introduced a more explicit erotic element into the story. "The very touch of your swelling bosom, when it has pillowed my weary head, has united us not only in thought, but in what is greater than thought, the sense of our power over the infinite." "You ask me, Ethel, why with that last burning kiss I parted from you, from home, from England?" And if the theory of renunciation in the *Wanderjahre* reflected Goethe's own separation from Friederike Brion, "does not ours exceed it in worth, who for two years, though double in form, have been one in impulse, soul, and life—we, who for each other have cast aside the bonds of a hypocritical society and the cant of custom."[12] This after Ethel, "for the Idea, had renounced all that vulgar custom forbids a woman to surrender." Well may two young men at Cambridge, whose experience of their own age and class was thus far limited also to their own sex, have roared with laughter at passages like these. And yet it is hard to isolate the temptations of the erotic from the moral idea of renunciation that structured Pearson's little book.

The *Urwerther* cannot be correlated paragraph by paragraph with the *New Werther.* About half of its verses were included in the published book, along with other poems by Pearson, as if sent by Arthur to express his feelings in another genre to Ethel. These verses include also some unmistakable fictions, yet where they differ from the printed *Werther* they give the more faithful representation of Pearson's thoughts and feelings, and they omit some of his more blatant inventions. He wrote the verses of his *Urwerther* on the recto pages of his notebook and inscribed notes on the facing verso, explaining some of the Heidelberg scenes as well as literary references. The verses place our young Englishman specifically in Cambridge at the outset of his travels, and announce his disappointment after he "took his grade and made perhaps his mark," presumably in the Tripos.[13] Although written in the third person, Arthur is the only real character in any version of this reverie, and nothing is described there except as it seemed to him. No Arthurian dimension is made explicit, but the hero does seem to be questing for the grail, in the form of truth and beauty, and the name would have evoked, for Pearson and his contemporaries, the hero of Tennyson's *Idylls of the King.* Arthur's self-obsession and chivalric dreams are nicely combined in an episode from the song involving one Kätchen, a "simple blue-eyed German maid" who waits tables, and seems to understand his suffering. He is charmed by his own emotional response, "feeling that he / could know a purer love, from sense apart, / Which unrequited must remain."[14]

[12] *New Werther,* 1–7, 52.

[13] *Urwerther,* stanza 12, Pearson Papers 11/4. There is no indication that this passage has an actual referent or what it might be.

[14] *Urwerther,* stanza 22. "Kätchen" refers probably to an actual woman, the reason perhaps for his regular walks to Wolfsbrunnen. His notes to the *Urwerther* imply that he did not even know her name, and he used the name of one of Goethe's first loves.

The New Werther, as published, deploys all the resources of a *schwärmerisch* romanticism, including thunderstorms over the castle, during which Arthur felt his soul to be "possessed of a god's power" and himself "the Spirit of the Storm," and a midnight ascent of the *Königstuhl* on Walpurgisnacht, enveloped in a crowd of young maidens who will look east from the summit at first dawn and make their wish, for husbands. Nature here is not cold and indifferent, but offers the possibility of embrace or even union, as in Goethe's image from the poem "Ganymede" of mutual absorption, *Umfangend umfangen* ("embraced embracing").[15] At the end of Goethe's *Sufferings of Young Werther,* the prospect of a union with nature draws the hero as to a sweet death. Pearson's drafts and novella play with themes and tropes from various works of Goethe. In the *Urwerther,* the local people at one point recognize Arthur as Faust and his dog as Mephistopheles. Arthur is indeed a Faustian hero, not least in his cultivation of a desire for nature that is portrayed as sympathetic but futile. Goethe himself had begun by the 1780s, after his discovery of Spinoza,[16] to emphasize its utter impersonality, and in *Faust I* the union with nature figures only as longing, or temptation. "My friend, all theory is grey, and green / the golden tree of life," incants Mephistopheles, who however characterizes Faust as alien from this, a "learned doctor," sitting in a cave "sucking some toad-like sustenance . . . from this dank moss and dripping stone." Faust can only pine:

> Oh endless Nature, where
> Shall I embrace you? Where, you breasts that flow
> With life's whole life? All earth and heaven hangs
> On you, who slake the thirsty pangs
> Of every heart—and must I languish vainly so?[17]

Pearson, as we know from letters and diaries, could experience nature intensely, almost rapturously. His tendency to pantheism included a sensuous dimension that was not merely abstract or philosophical. Only rarely did this surface in his scientific writings, the uncommon lament at the separation from nature implied by positivistic science. Yet a sense of his alienated condition shines through in admiring youthful descriptions of Tyrolean peasant life, or later during visits to the Yorkshire countryside, from which

[15] See Boyle, *Goethe,* 161.

[16] On the revival and reinvention of Spinoza as the God-drunken philosopher, see Barnard, "Spinozism," which emphasizes Coleridge's role in transmitting the German Spinoza to England and notes that in both countries the Spinoza revival was more literary than philosophical. Note that George Eliot spent her time in Berlin in 1854–55, working on a translation of Spinoza's *Ethics;* see Haight, *George Eliot,* 172, 199–200.

[17] Johann Wolfgang von Goethe, *Faust. Part One,* trans. David Luke (Oxford: Oxford University Press, 1987), 61, 104, 17.

his letters intimated sadness that his father's ambition, and his own, had torn the family irretrievably from the blessed innocence of the soil. He wrote from Danby in 1900: "My forebears were yeomen on these uplands & my great great grandfather was a fool ever to leave them! I should have known all about inheritance & never wanted to give expression to it in a law had he only stuck to the soil!" A few weeks later he headed another letter from the same location: "Date & day forgotten & no clock to be trusted to 30 ms."[18] The blessed world his family had forsaken, it seems, was a world without quantitative precision. Despite its personal cost, however, he defended the scientific life as necessary from an intellectual and ethical point of view. Science, a moral choice, involved sacrifice, which also had literary meaning. His beloved Goethe expressed for him not only the longing to be joined to nature as mother or wife, but also the fateful choice by which this longing was renounced.

Pearson's early moral essays were concerned centrally with the need to renounce. The *New Werther*'s effusions on this subject were not ironical, but deeply felt. "Do you remember," Ethel is asked, "when in our first friendship, two years ago, we read Goethe's 'Wanderjahre' together, and came upon his theory of Renunciation as a means of purifying mankind?"[19] Oscar Browning, who had presumably been involved in Pearson's discussions two years earlier of *Wilhelm Meister's Wanderjahre,* became almost lyrical in discussing the personal meaning of Goethe's renunciation. While "always striving for objective truth," he wrote, Goethe was by no means cold or selfish. "His nature responded to every influence of passing emotion. Like a delicate harp, it was silent if not touched, and yet it gave its music to every wooing of the wilful wind. The charge of unsympathetic coldness roused the deep indignation of those who knew him best. He learned by sad experience that the lesson of life is to renounce."[20] Goethe's *Werther,* as George Henry Lewes explained in his authoritative nineteenth-century biography, was, for the author, sincere and intensely personal. Yet that book illustrated by design the evils of a "languishing" sensibility that found proof of "immense superiority" in its "immense desires," and so refused to master, but yielded to, "the cry of that dim rooted pain."[21]

If Goethe's renunciation was about self-control, it was also about fate. Lewes explained Goethe's separation from Friederike, for example, as a necessity in view of their very different social stations, as well as an expres-

[18] KP to W.F.R. Weldon, 1 July 1900, Pearson Papers 266/9; printed in E. S. Pearson, *Karl Pearson,* 124.

[19] *New Werther,* 5.

[20] Oscar Browning, "Goethe," *Encyclopaedia Britannica,* 9th ed. (U.S.), vol. 10 (1879), 721–737, on 736, echoing in some respects Lewes, *Goethe,* vol. 1, 408–410. Pearson thought the Lewes biography to be overrated: Parker to KP, 22 June 1879, Pearson Papers 780.

[21] Lewes, *Goethe,* vol. 1, 218, 223.

sion of the "Egoism of genius," protecting his literary career from the impediments that marriage would bring.[22] For Goethe, renunciation was in part aesthetic, an aspect of self-cultivation, and need not be strictly opposed to inclination. Carlyle, who brought Goethe's doctrine of renunciation to Britain, understood it in a more Calvinistic way as an act of will enforcing rigorous self-denial.[23] *The New Werther*'s veneer of exaggerated "gush" meant that Arthur would recur often to his loss, and to the personal decision that occasioned it. Yet Pearson's novella, too, was driven largely by fate, and *Wilhelm Meister* was the point of reference for his moral message. His opening letter, about taking leave from Ethel, echoes the first chapter of the *Wanderjahre,* when Wilhelm, having first renounced Therese for a deeper love, recognizes that he must now separate also from Natalie. It is unmistakably painful: "What could separate me from you! from you to whom I belong forever, even if a singular fate parts me from you and unexpectedly bars the gate of the paradise to which I had come so near." But Goethe does not depict a momentous struggle of individual desire against moral obligation. We have instead an almost allegorical recording of lives driven by a purposeful fate. After the event, the Abbé, spiritual teacher and leader of Wilhelm and Natalie's little band, explains the necessity of all this personal sacrifice: "Devotion to family is . . . no longer sufficient. We must form the concept of devotion to the larger world, put our genuine humanitarian concerns in to practice on a broad scale, and further the good not only of those close to us but of all mankind."[24] Pearson cast Goethe himself as a moral teacher and supplied the reasons for renunciation in his first chapter.

They are something like the Abbé's. The hero and heroine, Arthur and Ethel, must grow beyond the selfish pleasures of two lovers and follow the dictates of social conscience in a world where so many toil unhappily "under a sham religion, a false custom, and a despotism of wealth." Thus Goethe's story exemplified for Pearson a move to greater impersonality, here in the romantic mode of dissolving the self into a larger humanity, indeed into the universe. For Pearson this dissolution had also the dimensions of a bold, Spinozistic intellectual quest. Arthur explains: "Man, as guided by the force of innate feeling, is necessarily religious, because he recognizes that he is a portion of the Divinity." Or, with Fichte, he makes self and world metaphysical coequals. Arthur wants to show that materialism and idealism are

[22] Lewes, *Goethe,* vol. 1, 147. In Pearson's notes on Schiller, 1878, Pearson Papers 11/6, he recorded Schiller's comment that to sacrifice happiness for "genius . . . is a painful & proud renunciation."

[23] Ashton, *German Idea,* 89.

[24] Johann Wolfgang von Goethe, *Wilhelm Meister's Journeyman Years, or The Renunciants,* ed. Jane K. Brown, trans. Krishna Winston, in Goethe, *Collected Works,* vol. 10 (New York: Suhrkamp, 1989), 100, 266.

at bottom the same, because spirit and matter are identical. He aspires, as he says, to unify the masculine domain of intellect with the feminine domain of feeling.[25]

These are the philosophical and emotional conditions of the plot. In quest of a reconciliation of opposites, the young man had determined to travel to Germany to study philosophy, science, and art. His destination for philosophy was written as "N," perhaps for the river Neckar that runs through Heidelberg. In his letters to Ethel, who was left behind in England, the hero reports on his studies and experiences. A particularly powerful one has him staring out his window into the darkness when a sudden bolt of lightning illuminates brilliantly the castle ruins he was facing, and the thunder merged into the crash of giant elm. Driven by an overpowering impulse, he

> rushed from the house, and as flash followed flash almost instantaneously, and the roaring of the thunder engulfed in a sea of sound the crashing of the trees as they waged battle with the wind, I reached the castle terrace. . . . All my heaviness had passed away. My heart panted; I flung my arms back; my soul seemed possessed of a god's power, and I felt I was the Spirit of the Storm. O Ethel, had you been with me, you would have known that Nature's God requires no churches, her religion no framework of creed.[26]

From here the text moves to an affirmation of Spinozistic pantheism, then to a Fichtean idealism, in which the universe is created by the mind of the "I," and cannot exist except insofar as he is there to grasp it. Arthur declares a deep responsibility to his suffering fellow men, and denounces the rottenness of society under capitalism as well as the corruptions of a mercenary Christianity.

Of the world's great teachers, Socrates, Christ, and Spinoza, two were Jews, he explains. The logic of the novella thus seems to require that he should meet and be taught by a Jew, here embodied in the person of one Raphael, whose features reveal "apostolic nobility and depth." Consistent with the essential solipsism of the story, however, Raphael's profoundest utterances reveal him as a Pearsonian double. He is made a socialist, with "utopia" as his "gospel," an antirevolutionary gradualist, and a mystic after Maimonides. He sees in man an essential religious element, beyond the reach of science at present, yet ever being supplanted by knowledge, until there should come about at last a union of faith and reason. At the same time, he "half despises all women, considering that all like Ophelia, are sensuous at core."[27]

[25] *New Werther,* 10–12. For other clear Fichtean elements, 58–59.
[26] *New Werther,* 8–9.
[27] *New Werther,* 30–36.

Although Arthur stands up for womanhood, Ethel finds it difficult from the beginning to follow his intellectual pilgrimage. When he sends her a book by the Austrian poet Robert Hamerling, whom Pearson was coming to regard as Goethe's equal, she sees only painful details and "great faults of taste." He reproves her for thinking that all the great systems of philosophy are mere fallacies, and his study of them a sickness. However, he is himself soon disenchanted by the results of his philosophical study—Pearson in real life complained "that philosophy tells for nothing that appeals to any other part of you than your reason." Arthur is reduced to hoping for better results from the investigation of science or art. To learn science beyond the "dead scholasticism" of "our universities" he has made plans to study in Leipzig. But first he wanders off on a solitary pilgrimage on foot through the Black Forest, all the while seeking meaning for the unholy nineteenth century by reading poetry from the twelfth. Through a "scientific faith," he hopes, his age can become "objective" rather than "subjective." He instances Darwin, then the prospect of physics reduced to the mechanics of a universal ether, and finally—an act of distancing—a transparent joke using curves and surfaces of human feelings to demonstrate the progress of science.[28] Yet in the next letter he spurns science as an utterly limited form of knowledge that excludes through its tyranny the needful human impulse to seek meaning in religion. And finally he despairs also of art, which in a mechanical age has abandoned the ideal of beauty for spiritless reproduction of degraded scenes.

Meanwhile, Ethel had traveled to Paris, and when Arthur learns that Raphael also had plans to go there, he naturally arranges for them to meet. They should become friends, and her high moral character would enlighten Raphael about women. A bit later, in despair at the collapse of his quest for truth, Arthur announces his intention to reclaim the one thing that remains, their perfect love. He arrives in Paris to learn that his Guinevere has been unfaithful, that Raphael and Ethel are now lovers. He has but one recourse, the destiny of Werther, and the story ends self-mockingly. "Ethel, Raphael, do not take the flattering unction to your souls that I fly from you. No, I fly from something greater from your small existences—I fly from *myself*. . . . Ethel—beloved—I die!"

Poetic Effusion and Truth

When in the fall of 1880 the Heidelberg law student Raphael Wertheimer received by post a book package from England, he was startled by the

[28] *New Werther*, 40, 84, 91 98; Parker to KP (reciting what he called Pearson's "dictum"), 17 Sept. 1879.

experiences and character developments it contained. It strained his English, but he knew enough to pronounce it *geistvoll,* ingenious. He also was able without difficulty to identify Loki, the author. Just one thing perplexed him. "*Wer ist Ethel??!* Who is Ethel??! Who Raphael is, I believe I can divine, although I do not consider 'Utopia' as my 'ideal Gospel' and do not 'all women despise,' etc."[29]

Pearson's little book was, as Wertheimer recognized, a mixture of life and invention. He really was seeking some kind of philosophical or scientific meaning, and with it a purpose in life, when he went off to Germany. When he grew discouraged with philosophy, which he decided could never teach him how to think and live, he told Parker of his hope that natural science might yet convey by way of experience what philosophy could not achieve through pure reason.[30] In Heidelberg he lived at Hauptstrasse 235, opposite the famous castle ruins, from which he viewed and was soaked by the exhilarating thunderstorm celebrated in the novella. Forty years later, when the Great War had reduced to ruins his old love of Germany, he fixed on just that experience to epitomize all that had been lost. Back then he had rejoiced in the terrible awe of echoing thunder, a triumphant ascent "through deluge and crash" of the Königstuhl, "rejoicing . . . in the spirit of the storm as if it were one's own youthful strength." Now, in 1920, the sound of thunder evoked nothing but a helpless, inexpugnable fear of German bombs.[31] But he could still use the novel to recall that year of self-discovery. The itinerary mapped out by the towns inscribed at the beginning of each letter seems to match his actual journey through the Black Forest at the end of his stay in Heidelberg. He did not travel in solitude, however, but was accompanied by his brother Arthur. Leipzig, where he studied science, stood in for Berlin, recommended to him by Oscar Browning because "Geist flows like water" there.[32] Frank Taussig, with whom he had boarded, responded to Pearson's gift of the book by recalling that he had already heard "much of what it contained . . . during our walks in Berlin."[33]

As for Raphael, his literary persona involved a measure of license. Pearson had met him by advertising for a walking companion with whom to

[29] Raphael Wertheimer to KP, 9 Oct. 1880, Pearson Papers 892/2. "Wer Raphael ist, glaübe ich richtig zü vermüthen, trotzdem ich nicht 'Utopia' als mein 'ideal Gospel' betrachte & nicht 'all women despise,' usw." From a Heidelberg University address book in Pearson Papers 11/5 we learn that Wertheimer came from Bühl in Baden.

[30] KP to Parker, 12 July 1879.

[31] Karl Pearson, "Impressions. The Aftertaste," ms. dated 6 July 1920, Pearson Papers 24/4. In *The New Werther,* the hero ascended instead to a castle terrace, a more likely destination.

[32] Oscar Browning to KP, 9 Jan. 1880, Pearson Papers 645/4. "Berlin is one of the most delightful capitals in Europe. Geist flows like water in the Trinkhallen."

[33] Frank W. Taussig to KP, 10 July 1881, Pearson Papers 865/6.

exchange German for English conversation. Although he was indeed a proponent of academic socialism, of economic transformation from above, it was not Wertheimer but some Berlin students who in real life had provoked Pearson's bemusement by their confusion of More's *Utopia* with a real socialist program. Wertheimer was fully secular, a contented atheist, which Pearson at first found slightly shocking, and it would be rash even to presume that "the Jew" rather than Pearson initiated their discussions of Maimonides. Most significantly, on the sensuality of women Pearson indulged in a reversal, for Pearson in these years was obsessed by the sexual impurity of women. His 1877 Commonplace Book, for example, includes this versification of a story he said he had heard while traveling with Oscar Browning: "In the Tyrol lies a valley / Where midst clustered groups of chalet / Stands a church with tower inclined / Threatening downfall on mankind. / Once a pure & holy virgin / Past that village with the church in / Straight that tower did to her bend / And homage to her virtue lend. / Thus three hundred years it's rested / Waiting else that legend jested / Till another virtuous maiden / Passes by, it then will straighten."[34]

The *Urwerther,* concealing less than the printed *Werther,* depicts Arthur as so disappointed by the Tripos results at Cambridge that he resolves to forsake truth for the epicurean life, putting his trust in women. "What needeth here to tell the rest?" it continues. "To free himself from pleasure's cancerous rust / He left his native land and fled the charms of lust." Those lines, though probably fantasy, represent his attitude about women in 1879. What his Arthurian double told Raphael in the *Urwerther* has the ring of truth:

> Yet, though more seldom, had they love discussed.
> Women, the Jew opined, were angels upon earth;
> While Arthur held they had nor faith nor trust,
> And lived alone for pleasure, sense and mirth;
> He never yet had seen their higher worth.
> "Art thou no poet? Hast though never loved?"

The last line here matches Pearson's Heidelberg diary, which he kept in German, as transcribed in a letter to Parker. On one of their first walks, the two began discussing poetry. "Then he [Wertheimer] continued. 'Have you never loved?' 'Never,' I answered. He assumed a tragic bearing and cried out: 'You are twenty-two and have never been in love!' 'Never loved'! I said . . . 'Have you no heart?' 'Evidently not,'" Pearson replied, as he fled the scene.[35]

Pearson's absolute unfamiliarity with love, if he spoke truthfully, would seem to reduce Ethel to a playful invention of the gushing ironist. But she

[34] Pearson Commonplace Book, I, 23, Pearson Papers 11/4.

[35] *Urwerther,* stanzas 12, 25; KP to Parker, 1 May 1879 (original in Pearson's German).

is not to be dismissed so easily. In the spring of 1880, when Pearson was back in Cambridge with his friends Parker and Conway, he tried to conscript them into his autobiographical fantasy. The three seem to have played the roles in midnight badinage, with Pearson, of course, as Arthur. In 1879, Pearson had left behind an intellectual soulmate, one with whom he subsequently shared an intense, deeply personal correspondence, saturated with the same philosophical groping and then frustration as was attributed to Arthur. This correspondent, though sympathetic, could not quite follow Pearson's wild ravings, and he journeyed Ethel-like to Paris while Pearson was mired in Teutonic metaphysics. The role of Ethel was an elaboration of Pearson's friendship with Robert Parker.[36]

Given the reputation of upper-class male relationships at school in the Victorian era, and the efflorescence of homosexual activity at King's College and elsewhere in the next generation, the reincarnation of Parker as Ethel may seem suggestive. There is no evidence to support, and much reason to doubt, that this friendship was ever explicitly sexual. At issue here was not sexual union, still less that social institution, with all its legal constraints, that bound together a man and a woman for purposes of procreation. The ideal was friendship, whose freedom, as it was supposed, from sexual impulse raised it above the love between man and woman, an ideal that was especially influential at Oxford's Balliol College under Jowett. His translations of Plato's *Dialogues* offered a clear classical model of masculine bonding, with the sexual dimension expurgated or ignored. From that standpoint, the homosexual acts for which Oscar Wilde was tried for sodomy in 1895 were a betrayal and not a consequence of this noble ideal. Sexuality, as such, was not contemplated here, but an enduring alliance of souls, providing the conditions for spiritual and intellectual growth, certainly was.[37] Or rather, as it now often seems, the sexual dimension was masked by an image of innocent manly friendship. Meanwhile, as almost everyone understood, youthful improprieties abounded, sometimes inflicted on weaker boys, and sometimes shared in a deeply felt intimacy. Tennyson's other Arthur besides the king was Arthur Henry Hallam, whose tragic loss his "In Memoriam" lamented: "I, the divided half of such / A friendship as had master'd Time." Pearson's literary substitution of a free marital union for an intense friendship between young men, like other elements of gush in *The New Werther,* was much more than a joke.[38]

[36] Helga Hacker identifies the relevant materials and gives a plausible reading in her notes on this episode in Hacker Papers, Box 8. From a reference to Conway as the "woman in scarlet" it seems that he spoke Ethel's lines in their 1880 play acting, but Pearson scarcely knew him in 1879.

[37] Richards, "Passing the Love of Women"; Dowling, *Hellenism and Homosexuality.*

[38] Alfred, Lord Tennyson, "In Memoriam," canto lxxxv.

Indeed, his emotional commitment to this form of friendship was particularly strong. A few years later, as we will see in chapter 6, he tried to develop the same model as a basis for intellectual intimacy with women. The results were dramatic, and not quite as planned. Finally, in 1889, he considered forming a free marital union on the principle of Ethel and Arthur, another experiment that went somewhat awry. From about 1878 to 1884, however, he was resolved to remain single, and he repeatedly emphasized to his contemporaries at college the tragic loss they would incur by entering marriage and starting a family. He expressed himself in this fashion to some of his closest friends on the occasion of their engagements, and his wedding congratulations to Conway took this form:

> But marriage, Josh? What shall I say thereof?—It opens wide & new experiences, it is necessary for him who would taste every side of life, but the life bondage, is it quite possible for the "progressive soul"? . . . The poor unfortunate individual—how the race enslaves him for the sake of its own progress!—thrusts its fetters upon him in order that *it* may prosper the better at his expense! Man the individual invented love; man the race, marriage.[39]

In letters of these years to his first close female correspondent, Elisabeth Cobb, he lamented the weddings of each of his male friends in turn, as if they had died and he were abandoned. Among them was Ralph Thicknesse, who recalled years later to Helga Pearson the night in August 1883, "when your Father took me out into the most exquisite valley in the Tyrol in the moonlight and said that all I wanted to make me perfect was for me to give up my belief in God & to throw over the girl I was engaged to be married to."[40]

Such recollections, and this case is not unique, would seem to blur the line between experience and gush in Pearson's fiction. The Thicknesse episode, whose setting seems so appropriate for a proposal of marriage, evokes most sensuously the confusion and rivalry between friendship and sexual love. A few years later, Pearson would incur the ironical wrath of his opposites in the Men and Women's Club by comparing sexual intercourse to mountain climbing, both vigorous activities giving pleasure that is shared with a partner. Allowing that to this point he seemingly had experienced only one of the delights in question, there are grounds here for associating with friendship at least a nebulous eroticism. It does not, however,

[39] KP to Conway, 7 July 1984. Pearson's views on men and women in 1884 were rather close to those his friend Shaw would preach in *Man and Superman* (1903), by which time he thought them scientifically mistaken.

[40] Ralph Thicknesse to Helga Pearson, 1 Sept. 1921, Pearson Papers 867/2; I date the event based on KP to Fanny Pearson, 20 Aug. 1883. In Berlin in 1879 or 1880 he and Frank Taussig made an agreement of some kind, involving a commitment by Pearson to remain unmarried for at least ten years. Taussig to KP, 10 July 1881, Pearson Papers 865/5.

reduce to a relationship of desire between two people, but involves also the shared pursuit of a goal. For Ethel and her Arthur, that goal was truth joined to beauty. And in every case there is present also a third party—not only the friends or lovers, but the mountain or the moonlit Tyrolean valley. For Pearson, nature too was unmistakably an object of desire, capable of diffusing her charm over the entire situation in which she was encountered. At the same time, she was maddeningly elusive.

Pearson adored natural settings and linked some of them to intense emotional experiences. One of these, in *The New Werther,* takes place during Arthur's solitary wander through the Black Forest. Just a mile below Schapbach (a real village), Arthur explains, he lay down among the ferns and long grass, and was lulled to sleep by the water rushing over a weir and falling into a pool:

> How long I slept I do not know; but judge my surprise on waking to find the place transformed—ten or twelve village maidens, unconscious of my presence, and knowing better than I the merits of that spot, had also come to enjoy the pleasure of an evening bathe! There they were, with loosened hair falling to their waists, splashing and sporting in the pool before me, as we fancy the nymphs did in the happy pastoral days of old! O Ethel, was it a sin for me to gaze on Nature in all her unveiled beauty?[41]

The watery rusticity and naked nymphs define the scene as mythical, and the presumed message is that nature for him could be like those beautiful maidens; it could, like the greatest works of art, transport him into "rapt ecstasy."

Such exultation did not allow for statistical specificity; the nymphs numbered ten or twelve. These rapturous experiences of nature were, for Pearson, notably unscientific ones. The thunderstorm over the Heidelberg *Schloss,* drenching Pearson in his own feeling of divinity as well as the pouring rain, is another. His letters from the early 1880s offer several further examples. The most luminous of these cannot be viewed directly, but only as refracted through Elisabeth Cobb, since his letters to her have disappeared. He was journeying joyously on foot through the Austrian Tyrol with Thicknesse, who walked too slowly for him, in August 1883, the occasion for his wild proposal of atheism and celibacy. They may also have experienced serious danger while climbing that summer. Pearson complained to Cobb that something in her letter had distracted him (as she paraphrased), "from those wonderful mountain solitudes." She was aggrieved. Why, she demanded, "did you ask me to write to you when my letters were to come to you inharmoniously; why not give yourself up altogether to the mighty Mother's magic, forgetting everything connected with men's Icons? . . . I

[41] *New Werther,* 78.

know so well what you describe, the longing to become part of Nature. But I think we can only have it when quite alone."[42]

Sham, Superficiality, and Detachment

In life, as in his art, Pearson was deeply frustrated in these years by his studies of philosophy and science. The reader may well wonder why the wanderer Arthur, having experienced so movingly the beauties of nature, should regard his studies as a failure and be driven to a miserable suicide. But what nature offered in life was inaccessible through science. In the mountains he could embrace nature, and feel her life within him, while science offered only description. There was, he thought, something noble in renouncing the abundant sensuality of immersion in sublime landscapes and assuming a position of remote detachment. It did not, however, provide the same satisfaction. Pearson expressed repeatedly, in a variety of circumstances, his utter discontent with falseness and sham. These he identified with the sad deficiencies of modern existence.

He came to the position that all science is mere description very early in life, if we are to believe his later recollections. To take his word on faith, however, would be rash, since his memory was so effectively stimulated by the urgency of denying that the Scottish physicist Peter Guthrie Tait had anything to do with this discovery. When Tait's Edinburgh ally and future biographer C. G. Knott published an unsympathetic review in *Nature* of Pearson's *Grammar of Science,* implying among other things that he had failed to give due credit to Tait for his conception of force, Pearson responded angrily: "I happened to be one of the unfortunate Cambridge students whose first notions of matter and force were obtained from the 'Treatise on the Dynamics of a Particle' [by Tait and W. J. Stele], and it was therefore a relief to me when I met with [Gustav] Kirchhoff 's 'Mechanik' in 1876, and found the subjectivity of force clearly insisted on." Or, still more pointedly, it was Kirchhoff and not Tait "who first helped many of us out of the mental obscurity as to dynamical principles produced by our study of the expositions of the laws of motion due to the Edinburgh school."[43] Indeed,

[42] Elisabeth Cobb to KP, 29 Aug. 1883, Pearson Papers 663. Courtney, "Ralph Thicknesse," 186, has them in Switzerland rather than Austria. She reports that Thicknesse's diary speaks of a near disaster and of his gratitude that his family was spared this great sorrow. There is no evidence of this in Pearson's correspondence.

[43] C. G. K[nott], review of *The Grammar of Science, Nature,* 46 (2 June 1892), 97–99; quotes from Pearson's replies in *Nature,* 46 (30 June 1892), 199–200, and 14 July 1892, 247. The reference is presumably to the third edition of Peter Guthrie Tait and William John Stele, *A Treatise on Dynamics of a Particle* (London: Macmillan, 1871). Tait was a combative fellow, aggressively religious and stubbornly unreasonable on all questions of scientific credit. In *Nature,* 32 (11 June 1885), 124–125, he criticized Pearson's editing of Clifford's *Common Sense of the Exact Sciences.* In later years, Pearson remembered the review, incorrectly, as an attack on the idealism of his *Grammar of Science.*

the first edition of Pearson's *Grammar of Science* invokes Kirchhoff for "the only consistent view of mechanism and the true conception of scientific law," and cites the original, 1876 edition of his *Lectures on Mathematical Physics.*[44] It is likely, nevertheless, that he exaggerated the impression made on him as a boy of eighteen or nineteen by Kirchhoff's treatise. In 1885, when he found it necessary to write a section on "mass" in the course of completing Clifford's *Common Sense of the Exact Sciences,* he supported his definition, as a ratio of accelerations, by citing the arguments of Ernst Mach's recent *Mechanics,* and did not mention Kirchhoff.[45]

Pearson was, however, vitally concerned with the status of scientific laws during these crisis years of 1879 and 1880, for reasons having mainly to do with his religious struggles. In June 1879 he outlined for Parker a thoroughly skeptical interpretation of science. "The more I have studied science & physics, the more surely I see that we know nothing of what we call nature, of electricity light and attraction we know nothing, what is the sense or truth of calling light a vibration? Or that gravity is a force between particles of matter if such exist." This was on a day when he felt "at a lower ebb of despair with regard to truth than I have ever felt before in my life, and believe if I only knew an energetic priest, he might easily make a convert and even a priest." Had the old Werther, like the new, been so utterly an intellectual, the sacrifice of reason in such a conversion might have been his suicide: "I believe my fate will be the Catholic Church, if I could only send my reason to the dust, for it is merely negative, it has never lead [*sic*] me to truth," Pearson wrote. The failure of science and reason to provide access to nature was one source of his depression. Philosophy since Kant, he said, shows that the mind makes laws of nature. "Fancy truth a function of that absurd humbug man's mind!"[46]

In Berlin, where he arrived in October 1879, his discontent about science became still more intense. In January 1880 he expressed himself as if from underground, not sure whether to attribute his foul mood to a toothache, a need to fall in love, or the inability to find a suitable object for his immense ambition. He wished the new year could bring

> something to call one to action, to give one a duty—were it even a second French Revolution! Shall I tell you what I would wish my son to be? Not a man

[44] Pearson, *Grammar of Science,* 139. On 361 he dealt harshly with *Dynamics of a Particle.*

[45] William Kingdon Clifford, *The Common Sense of the Exact Sciences* (1885; New York: Dover, 1955), 239–243; also Pearson's preface, lxv: "I should hardly have ventured to put forward these views had I not recently discovered that they have (allowing for minor differences) the weighty authority of Professor Mach, of Prag," citing "his recent book, *Die Mechanik in ihrer Entwickelung,* Leipzig, 1883." He reaffirmed the point in a letter to Mach, 18 July 1897, Pearson Papers 921/1.

[46] KP to Parker, 20 June 1879.

> of the world, not a trader, not a lover of books, but a student of Nature in herself and not thro' mathematical science, typifying idealising the beauty in that Nature for the benefit of mankind, the elevating mankind in spite of themselves, not for his own fame, nor with idea that he merely benefitted mankind, but because Art impelled, because she was his goddess, in short he should be Artist in the truest sense."[47]

He was a man without hope, wishing on behalf of some hypothetical son for what he, at age twenty-two, could no longer imagine for himself. The science he knew could do no more than grasp at appearances. What he longed for was to experience the beauty of unadorned nature.

Pearson's first formulation of an argument that science is mere description was no philosophy of science triumphant, but sad and resigned. It coincided with his greatest discontent about the deceit of surfaces. For several years he had complained that Christianity, in a capitalistic nation based on greed and exploitation, had become a sham, the foundation of hypocrisy and no more. This criticism of modern life as a sham culture was a common Victorian trope, scarcely unexpected in an admirer of Carlyle.[48] Pearson's mother had complained of "so much sham & profession *now*" that a "fearless denouncing" of it must be wholesome. (She also spoke of her husband's life of "deception.") Karl's own obsession with false appearances and misleading exteriors went far beyond the commonplace. *The New Werther* has an abundance of examples. Modern painting, as Arthur declares, is merely sensuous, never even attempting to reach "the ideal beauty in painting of the depth of plastic repose." Holiness, love, and friendship have become the mere "tawdry garments with which the whole Humanity would cover its corruptions." The "sham culture" of the unnamed Oscar Browning was defined as "well-hidden shallowness" and "a mockery of art." Only on the magical night of Walpurgis did Pearson dare hope to compel the "Spirit of the Universe" to "raise its veil."[49]

Outside of his fiction, as well as within it, he was becoming increasingly unhappy about another veil: "I wish the subjects which are considered immoral were more openly discussed between men & women, and that we could return to some of that Greek teaching which saw nothing immoral in maidens & youths racing naked together, but alas! the fig leaf grows daily larger & larger, till its very size creates a prurient curiosity to know what is behind it."[50]

[47] KP to Parker, 12 Jan. 1880, responding to Parker to KP, 1 Jan. 1880, who referred to an article in *Macmillan's* by John Robert Seeley on the materialistic aspirations of English fathers for their sons.

[48] The *Oxford English Dictionary,* 2d ed. (1991), s.v. "sham," credits Carlyle's *Past and Present* as introducing the "generalized sense" of the term.

[49] Fanny P to KP, 5 Feb. 1874 and 2 Nov. 1875; *New Werther,* 106–107, 114, 90, 25.

[50] KP to Parker, 29 July 1879.

Heidelberg had already failed to live up to the idealized image of Germany—Browning's image—that had drawn him there. Berlin, however, he disliked more intensely. He felt oppressed by the ubiquitous police and complained of the martial paintings and grand monuments to military leaders, notwithstanding the stars and double stars assigned by his Baedeker guidebook.[51] He gathered up most of the defects of the place under the rubric of artificiality and pretense. In his first letter to his mother from Berlin, in October, he called it "a city of very broad streets and *stucco* palaces which at first impress you but afterwards rather pall." "The Linden," he added, "is humbug." Left alone at Christmas, he fumed quietly about the city. "Unter den Linden . . . is a sham, in fact all Berlin is a sham, and London is a handsome city, compared with it."

Finally, in February he was able to travel with his closest Berlin friend, the German-American and future Harvard economist Frank W. Taussig, to Dresden. Dresden was a city of rococo palaces and splendid collections of old German art. It was then very popular with British tourists, including Oscar Browning, who went there for the opera. John Murray's guidebook repeated Herder's designation for it, the "German Florence," while Baedeker interpreted the rococo style as characteristically superficial.[52] Pearson, in raptures, adored its most celebrated painting, Albrecht Dürer's *Crucifixion,* and glorified the town, if not its monuments, as authentically German: "With the town I was delighted after Berlin, . . . the streets were crooked, the houses picturesque and the people good natured & genuine Germans while good honest Bierkellars & Lokals abound and not the horrible Vienna Cafés which crowd Berlin. It awoke again the fast dying love for Germany which four months of this stucco, Prussianism, sham, half-Paris, half-London, nothing-truly-German capital had beinahe [almost] extinguished."[53]

The one thing needful, it seems, was to avoid stucco, despised by Pearson's generation for its falseness. The condemnation was applied most sharply at home, often with hints that the buildings stood in for something more general. "As dishonest a sham," we read in an 1874 architectural

[51] K. Baedeker, *Northern Germany: A Handbook for Travelers,* 6th ed. (Leipsic): Karl Baedeker, 1877). There are at least two mentions of Baedeker guidebooks in his correspondence, though not with respect to Berlin. Oscar Browning traveled with the guides of John Murray, but Baedeker was synonymous with cultured travel in Pearson's day, and he liked when possible to go off the guidebook routes. Bernard Shaw deploys an obvious joke about guidebook stars and craven tourists in "Widower's Houses" (1893) in *Collected Plays with their Prefaces,* vol. 1 (London: Bodley Head, 1970), 54. On travel and guidebooks, see Sillitoe, *Leading the Blind.*

[52] Baedeker, *Northern Germany,* 216; *Murray's Hand-Book for North Germany and the Rhine,* 19th ed. (London: John Murray, 1877), 297.

[53] KP to Parker, 15 Feb. 1880.

guide, "as the stucco stone 'orders' of modern Regent Street." Walter Thornbury observed with bemused tolerance that the Duke of Somerset's Sion House, designed by Robert Adam in 1762, had once been regarded as light and elegant, in a beautiful antique style. Happily, we have grown wiser, and "despise stucco now as false and flimsy and pretending to be what it is not."[54] Stucco abroad, from more remote times, was a different matter. John Ruskin, who preached that every material should be worked in its characteristic way so as not to mislead the eye, was prepared to admire Venetian stucco on condition that there be no pretenses. "What? The reader asks in some surprise,—Stucco! And in the great Gothic period? Even so, but *not stucco to imitate stone*. Herein lies all the difference." William Morris similarly praised the "delicate richness of effect" of Pompeiian stucco wall decorations, where there was no effort "to disguise the fact of its being a solid wall and a flat surface."[55] Ruskin and Morris had a deep commitment to the honesty of art, art as truth. Pearson's contempt for Berlin stucco reveals once more the young Londoner, an earnest Victorian, who wandered to Germany in search of truth and discovered only misleading surfaces. Contrast Oscar Wilde's ironies in the 1890s, in Lady Bracknell's assessment of her nephew's proposed marriage partner. "A hundred and thirty thousand pounds! And in the Funds! Miss Cardew seems to me a most attractive young lady, now that I look at her. Few girls of the present day have any really solid qualities, any of the qualities that last, and improve with time. We live, I regret to say, in an age of surfaces."[56]

Pearson did find, intermittently, some consolation in idealistic metaphysics. Having departed from Cambridge with an up-to-date British reverence for Hegel, Pearson found that in Germany his reputation had faded into the shadows cast by Fichte and Schelling. Or so it was, at least, in philosophical Heidelberg.[57] Kuno Fischer's early Hegelianism had got him into political trouble in 1848. In 1852 he was accused of pantheism on account of his praise of Spinoza, and for twenty years he was a philosopher in exile. His work on history of philosophy, which helped to initiate the "return to Kant," was strongly idealistic in its tendencies—Kant

[54] John T. Micklethwaite, *Modern Parish Churches* (1874), quoted in *Oxford English Dictionary,* s.v. "sham"; Walter Thornbury, *A Tour Round England,* 2 vols. (London: Hurst and Blackett, 1870), vol. 1, 25–26.

[55] John Ruskin, *The Seven Lamps of Architecture* (1849; New York: Noonday Press, 1961), 58; Ruskin, *The Stones of Venice,* 3 vols. (1851–53; Boston: Dana Eyles, 1900), vol. 3, 24; William Morris, "Mural Decoration," in *Encyclopaedia Britannica,* 9th ed. (1884), vol. 17, 34–48, on 37.

[56] Oscar Wilde, *The Importance of Being Earnest* (1894; London: Nick Hern Books, 1995), 71.

[57] KP to Parker, 25 May 1879.

viewed through Fichtean spectacles.[58] Although Fischer's lectures during the spring of 1879 were on ancient philosophy, Pearson drank up Fichte in those months. More than mere idealism, this bordered on solipsism, the apotheosis of self, and Pearson remarked in letters, half in jest, that Fichte supported his natural egoism.[59] Arthur's report to Ethel on his wild ascent as "Spirit of the Storm" to the terrace of the Heidelberg castle ruins concluded with Fichtean remarks about the infinite "I" that creates the world by grasping it.[60]

Although dissatisfied with German philosophy, he still preferred it to the alternatives. In one of his earliest publications, a review in late 1880 of Frederick Pollock's study of Spinoza, he tried out the view that the active mind constructs its own world, according to a pure logic of thought or ideas. He announced there what he would continue to hold to the end of his life, that "Spinoza is the philosopher for men of science." But it was, as he called it, an "inverted Spinozism," a Spinozism modified by Fichte. Thought and matter are indeed identical, but this does not reduce mind to thinking matter. It is rather the mind that creates the world, in accordance with the laws of mind. "Space and time have long been recognised as sensation-frames, matter and force must now be added. . . . The outer world, as we conceive it, is the production of the conceiving 'Ego,' not an objective reality enforcing its laws upon the subjective sensitive centre." Because the logic of mind is universal, all individuals must experience the same sensations, and since "no law of nature can break a law of thought," miracles are clearly impossible.

Pearson thus reached, by way of idealistic philosophy, a philosophical view of science that has usually been described as Machian, but that owed nothing as yet to Mach, and not much to Kirchhoff. On this occasion he was apparently stimulated by Pollock, Clifford's friend and posthumous editor, who called "force" a "mere compendious symbol," which, with matter, was disappearing into energy, and referred to cause and effect as "a convenient artifice."[61] Laws of nature, Pearson concluded, are nothing more than laws of thought, and are "necessary to simplify the complices of sensation which we call light, heat, planetary motion, etc."[62]

German idealists had largely presided over the nineteenth-century resurrection of Spinoza's reputation, and Pearson's Fichtean reading in 1880 was not especially original. For a scientist, however, his radical ideal-

[58] Willey, *Back to Kant;* Köhnke, *Rise of Neo-Kantianism.*

[59] KP to Parker, 12 June 1879: "As I said to my German Lehrerinn (*sic*) today 'Vielleicht können Sie den Einfluss der Fichteschen Ich-Vergötterung in meinem heutigen Egoismus sehen.'"

[60] *New Werther,* 8–10.

[61] Frederick Pollock, *Spinoza: His Life and Philosophy* (London: C. Kegan Paul, 1880), 82, 160–161.

[62] Karl Pearson, "Pollock's Spinoza," *Cambridge Review,* 2 (17 Nov. 1880), 94–96.

ism was unusual, and he never abandoned it, even after he renounced Hegelian metaphysics as no longer of interest except to those pitiable young men from Balliol seeking a reconciliation of Christianity with reason. Pearson wanted a religion without theology, one that involved science more intrinsically. He insisted on Spinoza's pantheism, on the mystic element in his philosophy, which incorporated the world, including humanity, into the godhead.[63] Pollock, whom he otherwise admired, viewed this mysticism as a "bugbear," whereas for Pearson, much truth was hidden in it. The best men of all times—Plato, Goethe, Carlyle, Jesus—"have been more or less mystics." Spinoza, he argued, was greatly influenced by Maimonides, by the view that God knows the world as a part of himself. Again and again he stressed Spinoza's idea of the *amor dei intellectualis,* the intellectual love of God, which required that God be approached through the study of nature, and made love proportional to knowledge. Science by this reading was not merely finite and human, but something divine, an aspect of the process by which God came to a fuller self-knowledge.[64] Spinoza, he hoped, could satisfy those "cravings for a higher religion and a higher morality consonant with modern science and nineteenth century Humanism," for "a scientific faith, which, while satisfying the emotional cravings, shall at the same time be founded in reason."[65]

Yet in an important way the mystic god of Spinoza was quite out of reach. Pearson was seeking a philosophy that would give meaning to "those ecstatic moments" of connection with Nature when he "felt the divine presence."[66] These were sentiments he shared with such men as Leslie Stephen, who fancied that in the Alps he could ascend to "those lofty reveries in which the true mystic imagines time to be annihilated, and rises into beatific visions untroubled by the accidental and the temporary." And, like John Tyndall, Pearson was drawn to pantheism as an aspect of nature worship.[67] Spinoza's pantheism allowed a feeling of connectedness, but his god was, so to speak, entirely self-absorbed. To the individual, Spinoza offered

[63] This despite the arguments of one of Pearson's favorite works on Goethe, E. Caro, *La Philosophie de Goethe* (Paris: Hachette et Cie., 1866), 46. "Unfortunate Germany," he remarked: "It thought itself Spinozist when it was only pantheist." He continued that Goethe also made this mistake of his *pays.* Pearson's notes on Caro are in Pearson Papers 11/6, but he did not call attention to this passage, nor to Caro's interpretation of *Faust* as an allegory of the French Revolution.

[64] Ibid.; Karl Pearson, "Maimonides and Spinoza" (1884), in *Ethic of Freethought,* 137–155.

[65] Karl Pearson, "Martineau's 'Spinoza,' " *Cambridge Review,* 4 (22 Nov. 1882), 114–116; Pearson, "Pollock's Spinoza."

[66] KP to Parker, 29 July 1879. I would guess that this letter followed closely the thunderstorm episode.

[67] Leslie Stephen, "The Alps in Winter," *Cornhill Magazine* (1877), quoted in Dale, *In Pursuit of a Scientific Culture,* 208; Barton, "John Tyndall, Pantheist."

not rapture but renunciation. Goethe admired particularly Spinoza's "boundless disinterestedness," as in the passage where he called for a love of god so selfless as to require no love in return.[68] Goethe's account, in its turn, was admired throughout the nineteenth century, not least by Pearson.

By 1883, this was the spirit in which he interpreted the sense of oneness with nature. We find in the *Cambridge Review,* volume 5, a scholarly review by Pearson on Kuno Fischer's critique of Kant, dated "St. Leonhard in Passeir, Aug. 1883." This was the same Tyrolean journey that inspired his moonlight proposal to Ralph Thicknesse, and his explanation to Elisabeth Cobb of his yearning for oneness with nature. The pursuit of things in themselves, the review exhorted, is merely a hereditary emotion left behind from a more primitive state. "Can we not renounce once and forever our supersensuous cravings, in order to gain the fuller life and light of the sensuous world?" To renounce these cravings, "this grasping after absolute knowledge of the supersensuous," is very hard, yet therein lies the way to feel "the deep joy of that [sensuous] world."[69]

Such "deep joy" was rare enough for Pearson, far less common than his moments of black depression. Moreover, it was not only the supersensuous divine that he was driven to renounce. Alone in the Alps he could hope to dissolve himself into nature. But at his desk, writing mathematics, nature was nowhere within reach. In science, renunciation meant not the dissolution of self but the suppression of all personal desires. "I shall consider human actions and desires in exactly the same manner, as though I were concerned with lines, planes, and solids," wrote Spinoza. Under the heading "Of Human Bondage, or the Strength of the Emotions," he added: "When a man is prey to his emotions, he is not his own master."[70] Kuno Fischer, mixing biographical narrative into his history of philosophy, explained how Spinoza once fell in love, and the perfectly calm resignation with which he accepted its disappointment. Goethe, as Pearson would have known, looked to Spinoza's doctrine of renunciation to calm the raging passions, a moral lesson he incorporated into *Faust*.[71] Pearson, as a rational

[68] Goethe, *From My Life: Poetry and Truth,* trans. Robert R. Heitner, ed. Thomas P. Saine and Jeffrey L. Sammons (Princeton, NJ: Princeton University Press, 1987), vol. 1, 459. Pearson's notes on Goethe, *Aus meinem Leben,* probably from 1878, survive as Pearson Papers 11/6, where he noted particularly Goethe's reaction to this line in Book 16 as well as his praise of Spinoza's "utter disinterestedness." He continued that Goethe, unlike Spinoza, would have "demanded his individuality." This file contains also Pearson's notes on Lewes's biography of Goethe, where these themes are discussed on p. 281, and his note, on Caro's *Philosophie de Goethe,* see p. 59.

[69] Karl Pearson, "Kuno Fischer's New Critique of Kant," *Cambridge Review,* 5 (28 Nov. 1883), 109–111.

[70] Benedict de Spinoza, *The Ethics,* in *On the Improvement of the Understanding / The Ethics / Correspondence, trans.* R.H.M. Elwes, (New York: Dover, 1955), 129, 187.

[71] Kuno Fischer, *Geschichte der neuern Philosophie. Erster Band, Zweiter Theil. Descartes' Schule,* 2d ed. (Heidelberg: Friedrich Bassermann, 1865), 121–123, 543.

scientist and philosopher, largely resigned himself to this more temperate view of knowledge, spurning the temptations of rapturous union.

Objective Spirit

Pollock introduced a new sense of the term *objective* into English, explaining that it was less familiar in England than the correlative term *subjective,* "but is freely used by German writers to denote absence of prejudice and distortion, faithfulness in reproduction, and the like." "We are growing objective, and ceasing to be subjective," declared Arthur in *The New Werther.*[72] By 1880, when both passages were published, Pearson was strongly committed to this ideal. He emphasized renunciation as part of an effort to be more objective, to subdue the merely personal and to quiet his restless striving. He was in 1880 only beginning to be conscious of any disquiet arising, as for Goethe, from love or sexual desire. He thought of his unsettledness mainly in terms of a religious crisis and a longing for reassurance about God, for connectedness with nature, and for a purpose in life. His *New Werther* expressed this desire in metaphysical and scientific terms, a deep frustration at the wall that seemed to block him from grasping nature herself through reason and observation.

As in his novella, Pearson pondered suicide as the end of his problems. He was tempted also by other possibilities. One was the Catholic Church, which he understood as the sacrifice of intellect to unreasoning authority. Still more like suicide was the course of action on which he in fact resolved, to give up philosophy and science and resume preparation for the law. This owed nothing to any pressure from his parents. His mother expressed fear that "it is not quite what your taste & inclination would really dictate," and his father, despite having paid more than £40 to have him admitted at Inner Temple in 1876, was displeased at his decision now to enter "this overcrowded profession." The bar was for Pearson the counsel of despair. But it became his main project for Berlin, rather than, as he had originally planned, the study of physics in Hermann von Helmholtz's laboratory. Being the person he was, he continued despite his best intentions to read and study much more widely than his university courses dictated. The project of throwing philosophy to the winds was also blocked by the unfortunate disposition of the Berlin law faculty to teach their subject philosophically, so that he was soon back in the "claws" of that "mystic" Hegel.[73] German idealism, always alluring, never quite brought satisfaction. The yearning of the scientist to get beneath appearances to nature

[72] Pollock, *Spinoza,* 190; *New Werther,* 91.

[73] Fanny P to KP, 2 Nov. 1879; William P to KP, 29 Oct. 1879; Parker to KP, 26 Oct. 1879, and KP to Parker, 15 Nov. 1879.

herself, or to ascend to God, seemed ever less philosophically credible to him. His most consequential application of the doctrine of renunciation was precisely to these desires.

In this sense, he was still drawing lessons from Goethe's words, if not always his deeds. Goethe had explained that we are prone to see nature in relation to ourselves, and to measure it against a yardstick of human pleasures and desires. The student of nature must renounce these absolutely, he continued, although the "history of science teaches us how difficult this renunciation is for man."[74] Lewes drew this moral from Goethe's tempestuous life: "Activity and sincerity carry us far, if we begin by Renunciation, if we at the outset content ourselves with the Knowable and Attainable, and give up the wild impatience of desire for the Unknowable and Unattainable. The mystery of existence is an awful problem, but it *is* a mystery, and placed beyond the boundaries of human faculty. Recognize it as such, and renounce!"[75] Or, if we follow Pearson's own lead in *The New Werther* and acknowledge how desire for nature could be like love, his career appears like the early *Lehrjahre* of Wilhelm Meister, a triumph of renunciation, the abandonment of ecstatic union in favor of statistical description. Wilhelm, in the novel, was drawn to the theater and fell in love with an actress, Marianne. Through an unfortunate misunderstanding, he thought she had been unfaithful to him. Failing, as it seemed, at love, he abandoned the theater and took up business, the life of double-entry bookkeeping that his sober and orderly friend Werner had praised above all others. He became, in short, a quantifier: "And so our friend resigned himself fully to active participation in the world of business. To the astonishment of Werner and to the great delight of his father, no one was more industrious than Wilhelm in the countinghouse, on the exchange, in the office or the warehouse. . . . But sometimes he was unable to suppress a sigh even when his best faculties were being engaged."[76]

[74] Goethe, "The Experiment as Mediator between Object and Subject," in Goethe, *Collected Works,* vol. 12: *Scientific Studies* (New York: Suhrkamp, 1988), 11–17. On the limits of Goethe's application of this maxim in his own work, see Gillispie, *Edge of Objectivity,* 192–198. For a different view, Richards, *Romantic Conception of Life*.

[75] Lewes, *Goethe,* vol. 2, 339.

[76] Goethe, *Wilhelm Meister's Apprenticeship,* ed. and trans. Eric A. Blackell (New York: Suhrkamp, 1989), 43.

CHAPTER FOUR

Pearson's Progress:

A NINETEENTH-CENTURY PASSION PLAY

> Wisset, im Schwarmgeist brauset das Wehen des ewigen Geistes!
> Was da Grosses gescheh'n, das thaten auf Erden die Schwärmer.*
>
> [Know ye, in zealotry rushes the breath of the eternal spirit,
> When what's great comes to pass, that's done upon Earth by the zealot.]
> —Robert Hamerling, *Der König von Sion* (1868)

By late 1880, Pearson had found a doctrine to express his political discontent and began calling himself a socialist. He assumed at almost the same time a deep commitment to history as a mode of scientific understanding and of literary expression, of knowledge and passion. Under this sign he conceived in 1881 two failed schemes of social prophecy. One was his proposal to translate Marx's *Capital,* which the author declined. The other was to write a passion play for the nineteenth century, which he did in fact complete, only to see it fall stillborn from the press. Like the *New Werther,* this last provides an excellent guide to Pearson's sentimental education, even if it lacks specifically autobiographical material. The play reveals deep anxieties about maintaining a moral commitment to the public good in the face of worldly temptations. It is also a sexual fantasy of the most ambivalent kind.

While he was in many respects a notably restrained individual, Pearson displayed Dionysian abandon in his intellectual life, seeking personal and social meaning in almost everything he did. In literature, as in science, he idealized bold restraint. *Schwärmerei* (meaning zealotry or enthusiastic fervor) and renunciation, the outstanding ethical values of his youthful writing, are close to being opposites. Pearson treated them as complementary, preaching that enthusiasm must be channeled by reason, and that reason in turn demands sacrifice of self. He defended as warmly the

* Epigraph: Pearson particularly liked this line. In *The New Werther,* 41, it is quoted with mistakes, and in *Ethic of Freethought,* 25, correctly. Since Hamerling introduced the word here as an epithet of the respectable for the Anabaptists, which Jan van Leyden then reclaims, I've translated *Schwärmer* as "zealot" and *Schwärmgeist* as "zealotry." Pearson frequently identified his intellectual and moral position, and even his own temperament, with *Schwärmerei* but always translated it as "enthusiasm."

virtues of enthusiasm as of renunciation, and proved at last to be a *Schwärmer* for science—for the impersonal standards and self-denial that defined it. Renunciation was not simply a check on untamed human drives, but itself a thing to be celebrated, the basis of collective order. This moral discourse supported his philosophy of science, one that called on the individual to give up prejudice, and indeed all that is merely personal for the sake of society. Renunciation was thus to emerge as the leitmotiv of Pearson's form of positivism, which built a wall between mind and the world it studied, allowing as reward for the disciplined investigation of nature nothing more than an efficient catalog of empirical regularities. Yet such moral and intellectual attitudes would lead to a new form of society.[1]

The new order demanded by history would be a socialist one. Intellectually, Pearson's historical socialism owed something to his Berlin law lectures in the winter of 1879–80. Their historicist spirit was consistent with the outlook of his father, who preferred historical to dogmatic understandings of the law and devoted years of meticulous research to a manuscript, never completed, on the eleventh-century Domesday Book.[2] Ideologically, Pearson loathed the deductions of classical economics based on the selfish pursuit of personal gain, and looked, as many in Britain and Germany were doing in the 1870s and 1880s, to history as the basis for a moral economy of collective action.

Indeed, a commitment to history was the most direct outcome of his religious and intellectual groping during 1880 and 1881. I array the sources of Pearson's historicism under three broad headings, all of which began to take shape during his German year. The first is his continuing religious turmoil and his deep sympathy for Catholicism. Next is his growing political discontent, which crystallized during this year as a commitment to socialism. Finally, and perhaps most important, was his belief in the redemptive role of literature. In 1880 he was entranced first by the historical fiction of the Austrian poet Robert Hamerling, and then by folk productions of religious epics. The next year, after the failure of his *New Werther,* he undertook to write his equally unsuccessful and equally revealing passion play.

Not Quite a Catholic

The New Werther implies, truthfully, that Pearson arrived in Germany seeking in philosophy or science some equivalent to a religion. It does not stress sufficiently his continued concern with faith of a more traditional sort. In

[1] Karl Pearson, "The Ethic of Renunciation" (1883), in *Ethic of Freethought,* 78–114.

[2] William P to KP, 5 Jan. 1880, transcribed in Hacker Papers, Box 8; Pearson's Berlin Anmeldungsbuch, Pearson Papers 31/5.

the event, the issue posed itself. In Heidelberg, registering himself at the university, he was obliged to indicate his creed. Having, as he explained to his brother, no religion "but only religiosity," he accepted the suggestion of the *Quästor,* who duly inscribed *"Confessionslos"* (without religion) in the prescribed space. That word, he wrote in his German diary, "expressed my religious viewpoint as truly as if I had written 'nihilist' when asked for my political standpoint. I held divine services in the cathedral of nature and took a long walk."[3] When he recollected the experience in a public lecture nine years later, he emphasized particularly the confined space provided on the form for his answer, the tyrannical instrument of standardized belief that left no room for thought or originality. Having been snared in the statistical net by an imperious German official, he remembered (as he now imagined) "the hundred and more large pages occupied by the Augsburg Confession in my edition." "Why even Luther could not get his faith into a square inch," he muttered. "It had never entered the mind of the little man, who spent his Sundays in gazing at a Lutheran hymn-board, that any one could have a confession of *his own* which could not be labelled and fitted into a square inch."[4] The reminiscence has a certain poetic truth, though it is unlikely that he owned or had even read this work of Luther in the spring of 1879. Indeed, he was at this time acutely conscious of how much easier life would become if he could just squeeze his unruly self into one of those Procrustean boxes. He wrote passionately in letters to Parker of his "longing to believe," and of his desperate wish that someone could define for him his duty. These were the days when he complained most despairingly of the uselessness of reason as a purely negative force, and thought of abandoning it to become a Catholic.

While he never accepted Catholicism, even momentarily, it was much more than a joke for him, and he sometimes went to Catholic mass. One Sunday in June 1879, for example, he traveled with an Irish Presbyterian called Robinson from Heidelberg to nearby Speyer, significant historically as the town where Luther's revolt was first called "Protestant." His friend "took up the cudgels against Rome during service in the Cathedral. Of course I was bound to support her, the debate grew furious, we were turned out!"[5] He thought increasingly of religion in terms of feeling rather than reason during those years. Alluding to his reading of Spinoza, he remarked: "My God is unknown, undefined if you like, but never unfelt." *"Gefühl ist alles,"* he recited from *Faust.* "These lines ever come back to me."[6]

[3] KP to Arthur P, 26 April 1879, Pearson Papers 11/5: "Ich habe keine Religion, sondern allein Religiosität"; copy from Pearson's German diary, included in KP to Parker, 1 May 1879.

[4] Pearson, *Positive Creed of Freethought,* 4.

[5] KP to Parker, 20 June 1879.

[6] ("All is feeling.") KP to Parker, 29 July 1879.

His German instructor in Heidelberg, Frau C. de Castella, was a Catholic. He was on excellent terms with her, and they often discussed literature and philosophy together. Whether religion was also on the agenda is uncertain, but she knew of his metaphysical and religious uncertainties. Their subsequent correspondence suggests a degree of spiritual closeness. She responded to his *New Werther* by commenting on the difficulty of separating its *Objectivität* from its *Subjectivität,* meaning, presumably, truth from fiction. She sympathized with its Sturm und Drang, its turbulent spirit. The novella inspired her to remark that no institution was so elevated as the Roman Catholic Church, which, she must have supposed, could help him to still this storm and stress. Later she commented on the fundamental psychological insights embodied in the Church's dogmas and ceremonies.[7]

These were close to Pearson's own thoughts, which may well have owed something to their conversations, though he and Parker had also discussed the temptations of the Roman church. Pearson was moving in this formative period of his life to the view that traditional religion had its own legitimacy, in a domain quite separate from science and reason. He soon determined that Protestant condemnation of religious forms for lack of biblical warrant was quite misguided. From the time of Luther, Protestants had been unable to comprehend that such symbolism could "have arisen from some craving of mankind, some deep want of the human heart seeking to satisfy itself by outward ceremony."[8] The reference was not simply to the ignorant masses, but to himself. As usual, he was deeply ambivalent on these matters, since he soon began working to establish "Freethought" as a nonreligious faith grounded in science. Still, religion had to appeal to the emotions. Unitarianism, with its claims to a superior rationality, became the object of his withering scorn. If, he argued, we can accept on faith a God with the anthropomorphized characteristic of love, the Trinity is by comparison a small mystery.[9] He long held great sympathy for the Roman Catholic Church. In his defense against that Presbyterian Robinson, before the Holy Mother evicted both of them, he called it

[7] KP to Fanny P, 11 May 1879, Pearson Papers 11/4; KP to Parker, 12 July 1879; C. de Castella to KP, 29 Aug. 1880, 12 Nov. 1880, and 30 June 1880, Pearson Papers 654. She gave lessons in German, French, and English in Heidelberg, and was already acquainted in some capacity with one or more of Pearson's Cambridge friends. Her husband, from an Italian canton of Switzerland, taught Italian.

[8] Parker to KP, 22 June 1879; [Pearson], review of *First Principles of the Reformation, Athenaeum,* Jan.–June 1884, 146–147.

[9] Pearson review of Gaston Bonet-Maury, *Early Sources of English Unitarian Christianity, Academy,* 26 (13 Sept. 1884), 162–163; also Pearson, "Martineau's Spinoza," *Cambridge Review,* 4 (22 Nov. 1882), 114–116.

"the only possible form of Christianity" and appealed "to the beauty of its service and its historical position."[10] The legitimacy of religion was to be found in history, and the historical role of Catholicism was central to his researches of the early 1880s.

Socialism

He was, however, only secondarily interested in the history of Church dogma. What particularly attracted the attention of Karl Pearson, historian, was the social and economic role of religion, what he called the "old Catholic socialism." His dedication to socialism, while growing out of his criticisms of his own nation, developed particularly during his year in Germany and has often been attributed to his friendship with Raphael Wertheimer. This ascription rests entirely on Pearson's (quasi-) fictions. In his verse "Urwerther," the "Hebrew" Raphael is credited with vaguely radical positions. His printed *New Werther* identifies Raphael quite specifically as a social democrat and socialist of the chair (*Kathedersozialist*) and relates a full page of biographical background, including a strict orthodox upbringing, escape to a university chemistry laboratory, and trouble with the police in Berlin before he came to Heidelberg.[11] Almost none of this can be confirmed from Pearson's correspondence, unless one assumes the accuracy of everything Wertheimer didn't actually deny in his response to the book. In Pearson's letters we encounter "an avowed atheist and I shrewdly suspect a socialist" with whom he "debated about religion and philosophy," particularly "the Kantian & Hegelian theories of God." But he also told his mother that German students, unlike English ones, shun politics. Wertheimer, as characterized in Pearson's contemporary letters, intoned phrases such as *"Gott und Vernunft"* (God and reason), but was a skeptic about metaphysics, and answered Pearson's epithet *"Gelehrter"* (scholar) by calling him a *Schwärmer.*[12] The only indication of politics, beyond that shrewd suspicion expressed three weeks after they began their walks, comes from a letter, almost two years later, responding to Pearson's inquiry about *Kathedersozialismus.* Wertheimer unburdened himself of an elementary lecture about the importance of keeping one's head out of the clouds, working gradually, and introducing socialism from above. This would scarcely have been necessary if Pearson had long since been converted to socialism

[10] KP to Arthur Pearson, 19 June 1879, Pearson Papers 11/5.

[11] Norton, "Karl Pearson and Statistics," 22–24; MacKenzie, *Statistics in Britain,* 75–76; Pearson, *New Werther,* 52–53.

[12] KP to Arthur P, 18 May 1879, 22 June 1879, 4 July 1879; KP to Fanny P, 11 May 1879, Pearson Papers 11/5. The sentence about atheism and socialism may conceivably have referred to his other German walking companion, Julius Eisenach (see Pearson Papers 682/5).

by Wertheimer's conversations. A few months after this letter, Pearson attributed this thought about the need for gradualism to "a German" in a published essay. Several years after that, he doubted in print whether he "had ever met an educated German who was also a Socialist."[13]

Pearson already thought of himself as a political radical by the summer of 1879. When he informed Oscar Browning of his plans for Berlin, Browning offered introductions and told him not to be shy about "going into society." Pearson replied querulously—"have you forgotten that I am a democrat and in sentiments and language one of the hoi polloi?"[14] But his only mention of socialism sounds negative: a letter to his mother in which he complained of Bismarck's effort to govern without a parliament, on the pretense of being above party. "No wonder that socialism advances."[15] In November, after his arrival in Berlin, Parker told him of a debate "at the [Cambridge] union, on Socialism," which, since nobody knows what it means, is gaining power "as a panacea for this poor world, a passport to millennium bliss." Pearson said nothing of politics in his reply, but lamented Maxwell's death (of which Parker informed him in the same letter) and mentioned that he had taken lodgings with an American son of German parents.[16]

This was Frank Taussig, the future economist, also planning eventually to take up law, though he was enrolled at Berlin as a student of philosophy. He probably had more to do with Pearson's conversion to socialism than Wertheimer. Subsequently, in the spring of 1881, Pearson sent Taussig his first essay on socialism along with his *New Werther.* Taussig is the most plausible source for a sentence in that essay, placed just before Pearson's mention of the German who had called for revolution from above: "Oft have Americans told me that the social question was the great problem of the future, and that they felt convinced that in England the first attempts at solution would be made." Taussig responded to this missive that he had great faith in American workers, and looked for a revolution from below and not from above.[17]

[13] Raphael Wertheimer to KP, 7 March 1881, Pearson Papers 892/2. On 2 January he had explained sadly the new racialist anti-Semitism, which could no longer be escaped even by conversion to Christianity. The allusion to Wertheimer's letter is in Pearson, "Anarchy," *Cambridge Review,* 2 (30 March 1881), 268–270. On the lack of educated German socialists, see Pearson, "The Coming Factor in European Progress," *Cambridge Review,* 7 (21 Oct. 1885), 26–28.

[14] "Hoi polloi" appears in Greek characters. Oscar Browning to KP, 7 Oct. 1879, Pearson Papers, 645/4; KP to Browning, undated, Browning Papers, King's College Archives.

[15] KP to Fanny Pearson, 22 July 1879, Pearson Papers 11/4.

[16] Parker to KP, 9 Nov. 1879; KP to Parker, 15 Nov. 1879.

[17] Pearson, "Anarchy," 270. Frank Taussig to KP, 10 July 1881, Pearson Papers 865/5. Pearson's letters to Taussig do not survive, but Taussig's acknowledgment of an essay on socialism could refer only to this paper.

Pearson and Taussig experienced many of the difficulties of Berlin life together. Their move to the Französische Strasse, in the center of the city, during the second week of November 1879 coincided with a series of visits by the Berlin police. Because of Taussig's name and his excellent spoken German, the police were loath to believe he was an American, and wanted to impress him into the army. Pearson commented to his mother a few weeks later that his letters might arrive opened, and that the police had probably rummaged his books in his absence. "Perhaps the discovery of Marx's *Capital,* [Albert Schäffle's] *The Quintessence of Socialism,* and Spinoza, to say nothing of that *Leitfaden* [guiding thread] of Social Democracy the New Testament, has made them suspicious." "No wonder the German officials are suspicious," commented Parker, "when you write that you have 'no respect for God or man, especially when they take the form of authorities.' "[18]

Taussig can scarcely be fingered as a pure evangelist for socialism. Pearson became friendly with him at a time of increasingly intense political involvement, ostensibly for both men. Their stay in Germany was in the immediate aftermath of Bismarck's change of direction in 1878, which closed down social democracy as a political party and initiated new forms of social insurance. It was, in a very limited way, a prototype of the socialist revolution from above, backed up by the *Polizei.* Bismarck's police state was more intrusive in Berlin than Heidelberg, and the capital gave Pearson an opening to exciting and unfamiliar political ideas. He had the habit of following politics closely, as is clear from his ceaseless requests for newspapers from home whenever he traveled. In his letters to friends and family he discussed with alternating disdain and admiration the political scene in Berlin. He applauded Bismarck's social insurance initiatives, and warmly endorsed the German system of public education and its universal suffrage. On the other hand, the military ethos, oppressive officialdom, and the ubiquity of the police were disquieting. "The system must be expensive," he joked, "if such a highly respectable person as myself excites their suspicions." He was baffled by German political assumptions. "Poor Germany! and then every professor here lectures that freedom does not consist in the right to a sphere of individual action, but that the individual should bring himself to see the 'Vernunft' [reason] which lies in the laws."[19]

These professors, however, also took socialism very seriously and probably gave Pearson his introduction to it. "It is curious," he wrote in late November, "how all the professors drag even into Law lectures, the discussion of Socialism, for instant, in Jurisprudence the idea of socialists & Communists from Sir Thomas More to Marx. The Utopia of the former is quite a gospel

[18] KP to Fanny P, 24 Nov. 1879; KP to Parker, 10 Dec. 1879; Parker to KP, 23 Dec. 1879.

[19] KP to Parker, 12 Jan. 1880; KP to Fanny P, 2 Jan. 1880 and 24 Nov. 1879.

of some of the socialists here."[20] This last thought, it may be recalled, was attributed to Raphael in *The New Werther,* then disowned by Wertheimer in his response. Perhaps now it is clear why the fictional Raphael had to have spent time in Berlin. We may note that Marx required no introduction when Pearson first mentioned him in a letter to his mother. Still, Pearson was probably moved to acquire *Das Kapital* by his Berlin law lectures in the late fall of 1879. There is no indication that he was at first particularly impressed, and indeed he often learned to appreciate on reflection what he initially dismissed. After mentioning his acquisition of *Das Kapital* to Parker in December, he said not a word about its contents but entered immediately on a discussion of Carlyle's *French Revolution* and the need to choose a credo for which to work, putting aside metaphysical squabbles.[21] The Berlin social democrats seemed to place as much hope in Darwin as in Marx, which Pearson in 1879 thought bizarrely misguided. In addition to his law lectures, he had gone in November to hear Du Bois-Reymond lecture on *Darwinismus,* which thoroughly disappointed him. "He has an audience of perhaps 400 students, who think that some solution of their difficulties is to be obtained from the theories of evolution. Poor fellows they go & listen attentively to the possibility of producing a permanent race of mules, as if that could be any cure for tea at 6p a lb., and no marmalade at ¼ a pot!"[22]

Within a few years, Pearson would enlist himself in the effort he here dismissed, to seek solutions to the problems of society in Darwinian biology. He also began by 1881 to proclaim the cause of socialism. On the whole, however, his discontent with British capitalism was in the tradition not of Marx but Carlyle, represented in his own time by John Ruskin and William Morris. Their critique was explicitly aesthetic and moral as well as economic and looked back to an idealized Middle Ages in search of a lost wholeness and sense of community. Carlyle, especially in his later life, and Ruskin were deeply opposed to liberal individualism and cosmopolitanism. Their leadership of the defense of Governor Eyre, whose brutal suppression of a slave uprising in Jamaica had been condemned by such liberals as Mill and Huxley, displayed their racism in its most naked form. Ruskin argued that wage labor in England was white slavery, and that it must be eliminated before black slavery would become a legitimate issue. Pearson in these years was anti-imperialist, but on the now unthinkable ground that British administration was a costly benefit to faraway backward peoples, which workers at home could ill afford.[23]

[20] KP to Fanny Pearson, 24 Nov. 1879.

[21] KP to Parker, 10 Dec. 1879.

[22] KP to Fanny P, 24 Nov. 1879.

[23] Burrow, *A Liberal Descent,* 240–242; Semmel, *Governor Eyre Controversy,* 102–113; Sherburne, *Ruskin;* KP to Parker, 28 Dec. 1879: "What has fighting with the Afghans or Zulus to do with the millions of toilers? It only sends up the price of their food. . . . If India causes the price of bread to be 1d dearer for the masses, then let India perish!"

Pearson's historical studies, though remarkable for their freedom from anachronistic presentism, grew out of the concerns of his own day. His political commitments found expression also in other ways, among them a moment of particular enthusiasm for Marx's work. His correspondence during 1880 gives no indication of how he came to this position, although his first letter to Marx on 9 February 1881 indicates that *Capital* was then on the intellectual agenda at Cambridge, where Pearson had lived during the previous fall. Indeed, Marx was just beginning to acquire a reputation in Britain, after three decades of residence in London and many years reading official reports in the British Museum. It would be years, however, before he attracted anything like the attention showered on the American Henry George, whose proposals to tax the "unearned increment" of property value made him the most notorious author in the upswing of British socialism. There had been only a few serious discussions of Marx in British periodicals by this time. Pearson's interest was still quite unusual, as it preceded by some months the first organized socialist movements in England, and by several years the first efforts to translate Marx's major works.[24]

The first efforts, that is, apart from Pearson's own. In his February letter to Marx, Pearson proposed himself as translator of *Das Kapital*. He offered as reasons for the translation "first the almost absolute and gross ignorance of Englishmen of the most elementary doctrines of Social Democracy in Germany; secondly, the particularly opportune time which presents itself for extending the knowledge of these doctrines among the working classes in this country," and finally the signs of demand for the volume in Cambridge, where readers were compelled to use the French translation because most were ignorant of German. Pearson advertised his own residence in Heidelberg and Berlin and his studies of German thought and literature as evidence of his capacities as translator. He avowed also his "firm belief in the soundness of the fundamental doctrines of Socialism."[25] The translation, however, never came off. Marx replied on 15 February with an invitation to call on him two days hence. Pearson, regrettably, was not available on Thursdays, and asked Marx to respond by mail or name another date. Marx must have asked for a sample translation, and in any case he received one, which he rejected, perhaps with some

[24] Willis, "Marxist Thought in Britain," *Historical Journal*. John Macdonnell, "Karl Marx and German Socialism," *Fortnightly Review,* 23 (1875), 382–391, argued that Marx had been unjustly overshadowed by Lassalle. John Rae, in "Ferdinand Lassalle and German Socialism," *Contemporary Review,* 39 (1880), 921–943, and "The Socialism of Karl Marx and the Young Hegelians," *Contemporary Review,* 40 (1881), 585–607, mentioned his importance as a theorist but discussed mainly his political career as an organizer.

[25] KP to Karl Marx, 9 Feb. 1881, International Institute of Social History, Amsterdam. Pearson's three letters, and one reply by Marx, appear in an unpublished paper by Lewis Feuer, "Karl Pearson and Karl Marx: The Evolution of a Social Biologist."

hints of his trademark scorn, as inadequate. Pearson told Parker in April that he had received "a sarcastic note" from Marx "which ends our connection." He evidently destroyed that communication, and his final letter to Marx indicates that the great man had criticized his translation skills.[26]

A purely speculative suggestion by J.B.S. Haldane, in a centenary address on Pearson, introduced into the scholarship the idea that Pearson's switch in 1880 from Carl to Karl in the spelling of his first name may have owed to his admiration for Marx. This is now sometimes repeated as a fact, but there is no contemporary evidence for the claim, and there are reasons to doubt it.[27] Still, his appreciation of Marx was real, especially in early 1881. In his first essay on socialism he called Marx "one of the most extraordinary characters which this century has produced," and listed him with Adolf Held, Adolph Wagner, and Albert Schäffle among the leading "Katheder-Socialisten." Marx, he said, was a powerful, logical thinker, though a failure as a practical politician. Happily he was no anarchist; Pearson seems to have suppressed Marx's advocacy of revolution. Throughout the 1880s, he was an advocate of Marx's theory of surplus value, or "surplus labour" as he called it. In 1883 he proposed a radical economic paper for the British Association meetings, then withdrew when they offered him only a half hour to present what was intended as a withering critique of the English school. "I am very sorry," wrote John Neville Keynes, "that we shall not have your paper on Socialism at the British Association. I should have been particularly interested in hearing you demolish us poor economists."[28]

But he never engaged in any detail with the theories of classical or neoclassical political economy. Marx always stood for something quite general in Pearson's view, more significant as a serious, scholarly socialism based on extensive empirical studies than for any particular arguments. In Pearson's earliest papers on socialism he said nothing of theories of value, but simply listed Marx with other Germans as an advocate of the "historical method" of political economy rather than the "hypothetical method" of the inhu-

[26] Pearson's other letters to Marx, dated 16 Feb. and 11 April 1881, are also held by the International Institute of Social History. See also Marx to KP, Pearson Papers 760/4, and KP to Parker, 13 April 1881. In 1885, John Broadhouse consulted Pearson on translating Marx; see Broadhouse to KP, 15 Sept. and 23 Sept. 1885, Pearson Papers 644/4.

[27] Haldane, "Karl Pearson," 304, proposed also a more general explanation in terms of homage to German culture, which is more plausible. Pearson began using "Karl" consistently in late 1880 after some wavering earlier in the year, which by itself is possibly consistent with an act of reverence for Marx. He also signed "Karl Pearson" to letters to Parker on 18 Sept. 1878 and 29 July 1879, long before Marx's work meant anything to him. In the fall of 1880 he was immersed in old German history, and in a letter to Conway, 9 Oct. 1880, he referred to Charlemagne as "Karl."

[28] John Neville Keynes to KP, 10 July 1883, Pearson Papers 734/8. Pearson's proposals to Keynes, a fellow at Pembrook College, Cambridge, were mediated by Thomas Thornely, another Cambridge friend, and an admirer of Ruskin: Thornely to KP, 25 June 1883 and 9 July 1883, Pearson Papers 871/2.

man Ricardo, the inhuman Mill, and "Manchesterdom." Because it was purely hypothetical, the English method might have nothing to do with actual economies. Historical research was thus in every way to be preferred. The Marx whom Pearson admired was at one with Carlyle, Ruskin, and Morris in the encouragement he gave to historical and empirical study.

The Poet as Schwärmer: Robert Hamerling

Although Pearson undoubtedly read at least parts of Marx's *Capital* during that winter of 1879 to 1880 in Berlin, his letters and notebooks from this period contain not a word about Marx's theories. His great discovery of the period was not in science or social theory, but in literature. On the whole, he was unimpressed by the intellectual life of contemporary Germany. He expressed this bitterly in a letter to Oscar Browning, whose idealization of Berlin *Geist* he held responsible for his own disappointment. The Germans were not intellectuals, but they simply piled up information, and they were dirty and unhealthy to boot. Their wit was "coarse, indecent & barbaric," and modern literature by such authors as Gustav Freytag lacked depth. He made one exception: "for poets the greatest I have come across is Robert Hamerling," though even he did not yet strike Pearson as the equal of Tennyson.[29]

This letter, significantly, was dated 16 January 1880, when Pearson was at his most despondent due to lonesomeness and a toothache as well as his failure to find interest or purpose in the law. He had just read Hamerling's *Ahasver in Rom,* the verse epic that made its author's reputation. The coarseness and uninhibited egoism of its leading character, Nero, could not support much of the moral purpose or personal growth that Pearson demanded of literature, and perhaps the remarkable thing is that he went on with Hamerling. A few days later he began *Der König von Sion* (the King of Zion), a long book in unrhymed hexameter about the Anabaptists of Münster. Pearson began soon to praise it as "to my taste the most important work written in Germany since Faust." Thirty-five years later, his taste in this respect had not altered, except that he was no longer so sure about *Faust.*[30]

[29] KP to Oscar Browning, 16 Jan. 1880, Browning Papers, King's College Archives. British disdain for contemporary German literature was increasingly common in the 1870s and after; see Schramm, "Englands Verhältnis zur deutschen Kultur," 140.

[30] Pearson's library has been dispersed, but Helga (Pearson) Hacker has left notes on Pearson's markings in his copies of four books by Hamerling: *Ahasver in Rom* (dated by Pearson Jan. 1880), *Der König von Sion* (20 Jan. 1880), *Die Sieben Todsünden* (21 Feb. 1880), and *Aspasia* (20 Aug. 1881). Later he lent these books to Elisabeth Cobb, who also marked them, and this attribution to Pearson is my surmise. Pearson praised *König* in a letter to Parker, 3 March 1880. For his recollections, [Karl Pearson], "Wie steht's mit der deutschen Cultur," 34.

Although it is difficult, as always, to speak of Hamerling's "influence" on Pearson, these works clearly spoke to him. His passion play, his social essays, his concern with women's issues, and his evolving sensibility about nature were all shaped through his engagement with Hamerling's language, character depiction, and plot development. Hamerling offered stories of beauty and pragmatism, temptation and purity, cynicism and faith, enthusiasm and renunciation—of ideals that Pearson came to identify as the forces of history and as keywords for his own sense of historical mission.

Hamerling was an Austrian, born in a small town, and made his living as a schoolteacher until he achieved popular literary success with *Ahasver* in 1865. He prided himself on giving "realistic form to ideal content (*Gehalt*), or, inversely, clothing realistic content (*Inhalt*) in ideal form." The realism of his form has been doubted. *Ahasver* portrays a mythical world that is typically golden or shimmering, populated by Nereids, sirens, and tritons, and the landscapes of the *King of Zion* are repeatedly described as strange, portentous, or bewitched. Yet critics understood his idealized verses concerning distant times as full of meaning for the contemporary world, and this was also how Pearson read them. They did not construe Hamerling as providing light entertainment through fanciful tales of magic kingdoms, but as a serious and demanding author whose works would endure. His more favorable critics compared his work to Shakespeare, Goethe, and Homer, and the last of these has at least some plausibility, since his *King of Zion* relied heavily on the vocabulary of J. H. Voss's nineteenth-century translation of the *Odyssey.* He was antimaterialistic and consciously wrote against the bourgeois realism of his time. Toward the end of the century he became increasingly apolitical, and he criticized the rising socialism as utopian, but he distanced himself from German nationalism, especially the resurgent anti-Semitism. He nonetheless was appropriated by a *völkisch* interpretation, *Hamerling als Erzieher,* for which he was celebrated during World War I. After that he was increasingly forgotten.[31] Although there were many translations of his works, including an American one, he was almost unknown in Britain.

Hamerling was proud to have combined in his epics, as one critic said of the *King of Zion,* a classical form with the "sweet madness of the romantics."[32] He was, perhaps above all, the great literary champion of *Schwärmerei*. In *Ahasver,* Nero embodies cynical hedonism, rejecting reason and faith alike as obstacles to pure egoism and the absolutism of will. Any hint

[31] See Klimm, *Zwischen Epigonentum und Realismus.*

[32] *"Holden Wahnsinn der Romantik;"* Feodor Wehl, quoted in Robert Hamerling, *Stationen meiner Lebenspilgerschaft, Sämtliche Werke,* vol. 13 (Leipzig: Hesse & Becker Verlag, n.d.), 228.

of moral values, as among the Christians, brings forth from him the epithet *Schwärmer.* At the end, with Rome in ruins, he finds himself in the power of a *Christenschwärmer,* indeed a German one, who is capable of renunciation and is able to forgive. The world, Nero realizes, is being renewed, even as his Roman empire falls apart. His suicide releases the spirit of Ahasver, the eternal or wandering Jew, signifying here the "eternal human (*ewige Mensch*)." Ahasver's migration to the North is the victory of enthusiasts, of German Christianity, and the beginning of the next phase of world history.[33]

The King of Zion, however, was unmistakably his greatest novel of Schwärmerei and, not by coincidence, Pearson's favorite. The historical resonances of this German term are highly relevant here. It is cognate with swarms, as of bees or perhaps moths. Martin Luther gave it its modern meaning by applying it to radical enthusiasts and revolutionaries such as Thomas Muentzer, leader of the peasant rebellion. By the same logic it would apply perfectly to the Anabaptists. A Schwärmer was so confident of divine inspiration and of unmediated knowledge of the "living word" that he could dispense even with the Bible. Goethe's Werther, who was dreamy and ineffective, provided one model of the Schwärmer at the end of the eighteenth century. The French Revolution, with its wild ambitions, gave another. In Britain, Schwärmerei began to be used after the revolution as more or less the opposite of *English,* thank God. To speak of a German writer or philosopher as free from Schwärmerei was to hold his work suitable for domestic consumption.[34] Throughout the history of this word, opponents of radical enthusiasm in Britain or Germany might yet recognize that passive indifference and dead legalism were also undesirable. Hamerling deployed the concept as a positive ideal, not merely as critique. By putting bold and memorable lines about Schwärmerei in the mouths of his Anabaptist zealots in besieged Münster, he gave grounds for a defense where the term was most vulnerable.

Was he seeking to redeem his own experience as a student in Vienna in 1848? He had been a Schwärmer then, writing in a newspaper about that

[33] Robert Hamerling, *Ahasver in Rom* (1865), vol. 3 of Michael Maria Rabenlechner, ed., *Hamerlings sämtliche Werke* (Leipzig: Hesse & Becker Verlag, n.d.). In an "Epilog an die Kritiker," Hamerling explained, plausibly, that Ahasver is not really the *ewige Jude* but the *ewige Mensch.* Plotting the career of the wandering Jew as the migrations of the world spirit was already an established form in Hamerling's day. Nero's "Ist [Vernunft] mein eignes Ich? / O nein, mein Wille nur, das bin ich selbst! / Unendliche Wollen ist unendlich Leben!" (118) would seem to echo Schopenhauer, who became a celebrated philosopher after the collapse of the 1848 revolutions. Hamerling denied any influence.

[34] La Vopa, "The Philosopher and the *Schwärmer*"; *Oxford English Dictionary,* s.v. "Schwärmer."

glorious year as the threshold of a new era, where subjection and raw force would give way to a principle of reason, and above all to that fundamental ingredient of human well-being, which alone gives value to freedom, namely *love*. Hamerling understood from his own experiences in radical Vienna the pressures of a siege, with its deceptions and false attacks, as its enemies waited for the revolution to corrupt itself from within.[35] He could not, in his maturity, condone the absolute idealism and absolute insouciance of this romantic quest, yet still he found much to admire in its purity of motive.

On these points, Pearson was in complete accord. He praised Hamerling's book as the account of a moral struggle:

> It is the contest between "Fleisch" & "Geist" [flesh and spirit] and again between the two and the union of them both in the aesthetic ideal of beauty. The "Geist" takes the form of the rebirth of mankind in the Anabaptists of Münster. Their king (Sion's König) is Jan van Leyden & magnificently portrayed in his struggles to a higher ideal yet accompanied by sensuous beauty (Greek Ideal). The "Fleisch" is represented by a somewhat demoniacal gypsy woman, the aesthetic ideal by a rebaptised nun, the contest of course lies between the two for the king's possession. The "Zeitgeist" is admirably given in these somewhat curious & tawdry yet generally historical personages. Language worthy of Shelley as in fact Hamerling's generally is.[36]

Hamerling's epic was populated by historical characters and based on scholarly study of the Münster uprising, though he took some clear liberties with the plot. As Pearson explained, it revolves around a struggle between purity and sensuality, each embodied in the form of a woman. The Anabaptists take on as their own the term of abuse invented by their enemies, Schwärmer. Luther had led them out of Egypt, but it remained to enter the promised land, and for this they must overcome the dry legalism of the Word.[37] Their zealotry takes extreme forms, including an orgy of book burning, in which Bibles too are consigned to the flames—although the "king," Jan van Leyden, speaking eloquently for art, entreats them to save works of literature.

Not Schwärmerei, but impurity, brings about their downfall. The prophet of Haarlem, Jan Mathys, warns that these are pregnant times: woe if our hearts be impure. Toward the end, when catastrophe looms, this line

[35] Hamerling, *Stationen meiner Lebenspilgerschaft,* 103–107, 113.

[36] KP to Parker, 3 March 1880.

[37] "Schwärmer benennen sie uns—ja! Schwärmer, das müssen wir werden;/Herrscht nicht lange genug schon das nüchterne Wort und der Buchstab?" says the prophet Jan van Mathys: Robert Hamerling, *Der König von Sion: Epische Dichtung in zehn Gesängen,* 6th ed. (Hamburg: J. F. Richter, 1874), 16.

is repeated by Jan van Leyden.[38] Purity did not require sensual denial. Jan van Leyden, after hearing the beautiful nun Hilla's story and falling in love with her, tells her in rhyming verse of his heart's longing for a realm where earthly and heavenly happiness can be combined:

> Immer verlangte das Herz mir, nach Kronen des Glückes zu greifen,
> Immer erträumt ich ein Reich, wo sich Himmliches, Irdisches einten.
>
> [Ever my heart must desire the crown of delight to reach after,
> Ever imagines a realm where the earthly with heaven united.]

She is to be his *Minne,* his Dulcinea, "as proper as innocence itself, and more pious even than renunciation."[39] They exchange passionate kisses, and thereafter, as a reminder, he will keep on his breast the little rose she gives him. But the joys of love are not to be confused with wantonness. The dark gypsy temptress Divara, who wants to be queen, personifies the forces that bring down the new Jerusalem. With support from the crowd, she presses for polygamy, and despite the reminder of Hilla's *Röslein,* Jan is sorely tempted. Finally, his moral resolve is brought down by demagogy. His reluctance to embrace the principle of plural wives brings from the rabble-rouser Krechtling the significant accusation of Schwärmer. Krechtling, free of all idealism, invokes considerations of utility, the need for population increase, in defense of polygamy. Cold sober reason is supported by the concupiscence of the unattached women. Jan succumbs, though not without regrets, to these dark forces, and Münster sinks rapidly into corruption and decay. The collapse of Zion was not, in Hamerling's poetic retelling, a military defeat by forces of emperor and bishop, but a moral collapse from within.[40]

Pearson's response to the sensual aspect of Hamerling's writing, developed still more explicitly in his subsequent *Aspasia,* is particularly relevant to the topic of chapter 6, on women and the woman question. Like Jan van Leyden, he too was seeking a reconciliation of beauty and passion with an earthly if not a heavenly faith, the moral and intellectual demands of science. Hamerling also provided material and inspiration for Pearson's social and historical vision. Pearson endorsed wholeheartedly, and with still less irony than the poet, the necessary role of enthusiasm in a campaign of social reconstruction. He translated Hamerling's tragic story into a positive vision of rapturous Schwärmerei guided by reason, of religious values

[38] "Groß ist die Zeit und gewaltig, doch Wehe, wenn unsere Herzen / Rein nicht sind: wie sollen im riesigen Kampf wir bestehen?" Hamerling, *König von Sion,* 15 (erster Gesang), 258 (neunter Gesang). Pearson marked this passage and used it as the epigraph for *The New Werther.*

[39] Hamerling, *König von Sion,* 104–105. "Keuscher als Unschuld selbst, und frömmer als selbst die Entsagung." The couplet was marked in Pearson's copy.

[40] Klimm, *Zwischen Epigonentum und Realismus,* 190–196.

that could be re-created and advanced by science. In his endorsement of enthusiasm, Pearson reiterated his contempt for a purely utilitarian ethic. The faith he developed during these years raised up impartial objectivity not as cool value-neutrality, but as a rational enthusiasm. Science could bring about the union of enthusiasm and renunciation, Schwärmerei and *Entsagung*.

Life as a Passion Play

By the time Pearson left Berlin, in March 1880, he was taking a more favorable view of Germany again, even musing about a "genteel appointment" in Berlin for a few years. He was, in any case, deeply dissatisfied with the law and would eagerly have taken a physics post had one been offered. Meanwhile he decided to take rooms at King's College for the summer and fall. He hoped for a fellowship, which indeed soon came through, providing support for three years at a modest level. At Cambridge, after *The New Werther* was out of his hands, he began reading in earnest for the bar. Soon he was disgusted, and again bruiting a change of course: "There seems no order, no method, only a historical hotch-pot to be made out of Eng. Law. I hate it profoundly. . . . Most of my time given to absolutely useless 'Mittelhochdeutsch' & the rest to grumbling."

The medieval German was, however, for a purpose, and soon he was entranced by it. He had identified twelfth-century Germany as a "heroic period," one that he preferred to Greek antiquity because he possessed a "northern actional & not a southern restful spirit." "Yes, old fellow, away with German literature of this later day. These dark old figures are like Rembrandt wrapped in a magic mystery which even exceeds the Greek repose & beauty."[41] By April 1881, at the latest, he was reading systematically on passion plays, having acquired some German books on the subject. "I shall devote my time to the religious productions of German literature before 1300," he explained in a letter written on Easter Day. "I believe there is much hidden in the early 'Mystiker,' the root of all modern Christian philosophical idealism."[42]

He applied in the fall of 1880 to lecture for Cambridge Extension, in part because of financial need, although he feared he could not be ready in time to meet their scheduling demands. "Visions also of the intelligent working man on Sunday evenings hanging on my 'atheistical and infidel' oratory have been raised." Perhaps it was discouragement at the reception of his *New Werther* that led him on 23 November to declare once more his

[41] KP to Parker, 27 July 1880 and 5 Sept. 1880.
[42] KP to Conway, 17 April 1881.

unwavering resolution to sacrifice these intellectual dalliances and devote himself wholly to law. Yet he drew back almost instantly from what Browning called "the clutches of the remorseless bar."[43] Only a week later, he announced a "life project" to fill his spare time as a barrister. It was to be a "19th century 'Passionspiel' or 'Mystery.'" In outline, it was to be as follows: "The Trinity. A Mystery. Part I The All-father. Obedience or Duty. II The Son. Love. III The Holy Ghost. Thought or Reason." Part I remained nebulous in conception, but he attributed the inspiration for parts II and III to Goethe's *Poetry and Truth* and to Spinoza, respectively. He would begin with part II, seeking to separate "as far as possible Jesus the *man* from the legendary God-myth."[44]

He had witnessed a passion play the year before, but its effect on him was not altogether uplifting. "We saw a Passion Play in the Schwarzwald & were much amused, the costumes were very good but the ass! The Lord's supper after Leonardo da Vinci was a success, though the peasants hardly appreciated it I think."[45] Most likely his readings on twelfth-century Germany stimulated him to attribute increased significance to this cultural form (his 1883 course of lectures on passion plays is discussed in the next chapter). Hamerling had something to do with this interest also, as we learn from a lecture Pearson gave in Cambridge on 30 April 1882. The lecture was part of a series of conferences on "Moral Teachers of the Present Day," organized by Edward V. Arnold. Invited to present something on philosophy in modern-day Germany, preferably Schopenhauer, he offered Hamerling. This occasioned a certain disquiet: "I am afraid we know very little of Hamerling, and from what I can gather here I feel some alarm at the subject. While . . . admitting the necessity of discussion (on occasions) of questions of sensual and sexual morality, I do not think it would be wise to raise any such discussion at one of our meetings, which are public in character, and attended by women in the very difficult position of Newnham students."[46]

Pearson, the most resolute of men, was not deterred. Hamerling's work, he explained to this mixed audience, was about the relation between "Sense pleasure and Soul-joy." The *King of Zion* provided a perspective from the Christian standpoint, with Jan van Leyden illustrating "the value of the enthusiast & his conversion of life into a Passion Play." This meant that virtue was to be "made one with pleasure." Jan's project had to fail, he explained, because it sought change through revolution rather than

[43] KP to Parker, 5 Sept. 1880 and 9 Nov. 1880; KP to Conway, undated Dec. 1880; Oscar Browning to KP, 7 Oct. 1879, Pearson Papers 645/4. He had breakfast with Browning on 12 November 1879.

[44] KP to Parker, 30 Nov. 1880.

[45] KP to Parker, 17 Sept. 1879.

[46] Edward V. Arnold to KP, 24 March 1882, Pearson Papers 628/2.

evolution. But much of the responsibility lay on Divara the "Demon-Wife," who corrupted this noble ambition by preaching a pure gospel of sense and by cynically dismissing all "higher striving" as vain.[47]

Just a few days after his lecture, Pearson's passion play was issued anonymously by the Cambridge publisher E. Johnson. It was Part II of his grand scheme, subtitled *The Son; or, Victory of Love*. Pearson had paid about £30 for the printing of three hundred copies, but the publisher, unwisely as it happened, agreed to take his own fees from sales. Pearson sent a copy of the book with his lecture outline to Hamerling in Graz, who responded with praise for the poetic language and blessed it as "pervaded by the German spirit (*beseelt mit dem deutschen Geist*)."[48] Hamerling appears also to have arranged a flattering German review.

Edward Arnold assessed the volume for the *Cambridge Review*. Having had occasion to learn something of Pearson's intellectual formation, he observed that the character Mary Magdalene, who preached the gospel of love "in its sensuous form," was "a kind of Jewish Aspasia."[49] This referred to Pericles's concubine, but really to the altogether seductive heroine in the prose work by Hamerling that bore her name, his only book that had been translated into (American) English.[50] Arnold's comments were very much on the mark. Pearson believed that a passion play for the nineteenth century had to address the crucial matter of sensuality.

It is difficult to imagine, especially after the experience of *The New Werther,* that he could have expected his anonymity to be preserved. His sensitivity about the book is easier to comprehend. He was once more trying his hand at poetry, in spite of the discouraging results thus far, and the preliminary reactions to this attempt were no more promising. His mother, responding to early chapters, feared that it was leading to a seduction of Jesus and hoped for a triumph over baser nature. "I cannot but feel some great sorrow has cast its shadow over your life making you write so morbidly & even bitterly of my sex." Robert Parker expressed worries about the verse, and about the consuming sensuality of Mary Magdalene, which would never by itself have attracted such a man as Jesus. He also wondered if Pearson was right to suppose that woman has less idealizing power than man.[51]

[47] KP, "Lecture on Robert Hamerling" for "The Cambridge Religious Conferences," Pearson Papers 47/2.

[48] E. Johnson to KP, beginning 9 Dec. 1881, Pearson Papers 730/2; Robert Hamerling to KP, 11 July 1882. Pearson glued Hamerling's letter into his copy of *Ahasver in Rom,* which I have not traced, but Helga Hacker's transcription may be found in Hacker Papers, Box 10.

[49] Edward V. Arnold in *Cambridge Review,* 3 (7 June 1882), transcript in Hacker Papers, Box 10.

[50] I introduce Hamerling's *Aspasia* in chapter 6.

[51] Fanny P to KP, undated, summer 1881; Parker to KP, 4 July and 20 July 1881.

A still more severe critique came from Charles Kegan Paul, who had published Pearson's *New Werther.* Kegan Paul was a King's graduate from an earlier generation and a lapsed English clergyman turned Comtean positivist, whose spiritual odyssey led by 1890 to his acceptance of Catholicism. His assessment, as Pearson summarized, was "crushing, absolutely damning." The verse he pronounced rough and often prosaic. Particularly unfortunate were the short octo-syllabic lines, which really required the talent of a Goethe or a Matthew Arnold. He doubted the possibility of so strong a sexual impulse in women as Pearson had bestowed on the Magdalene, and also the propriety of publishing such material, especially in connection with Jesus. It was not only wrong, but worse, it was tasteless; "it would blow any publisher & author into the air." Finally, he condemned its inaccuracy as history. The characters, such as his cobblers and clowns, would have been impossible in the time and place of Jesus, even apart from their nineteenth-century slang. A harlot would have gone veiled, and would not talk to working people in the street. Pearson was not quite convinced by all of this. Weren't Shakespeare's characters so true to life because he gave form to them "in the language of his own day?" And hadn't many poets, including Hamerling, Swinburne, Morris, Goethe, and even Tennyson, presented sexuality more or less openly. "If he had read König von Sion, he would have seen more what I mean by the problem & its connection even with a man like Christ."[52]

Although Pearson had plausible replies to most of the objections, he was crushed by so severe a critique from this learned publisher, especially as it coincided with, and helped to bring on, another crisis regarding his loathing of the law and his failure to settle on a profession. A more pertinent question than why he published anonymously is why he put himself to the expense and risk of publishing this work at all. A partial answer is that he believed deeply in the ideas he was expressing and hoped these could compensate for the imperfections of poetic form. This was how he justified the book in his foreword. Writing of himself in the third person, he explained that on rereading the book, "full of doubt, he seemed half conscious of an element of truth therein." There was also, however, a clear element of self-revelation. The apologia continues: ". . . for he had written them earnestly,—and Earnestness and Truth are twin sisters, if they be not two names for the only daughter of God."[53]

The book was, after all, intensely personal, and it calls out to be read as an effort to validate his groping and indecision of the previous three

[52] C. Kegan Paul, *Memories* (London: Kegan Paul, Trench, Trübner, 1899), esp. 364–365; KP to Parker, 24 Oct. 1881.

[53] [Pearson], *The Trinity: UK:* v. That he may have defended the book by privileging thought over form is suggested by a letter of his friend Robert Blanchard Raffles, 16 Oct. 1882, Pearson Papers 823/5. Raffles, then a teacher of Shakespeare to schoolboys, was unimpressed.

years—indeed his life—by finding in his struggles a lesson of transcendent significance. As before, Pearson's preferred genre for the presentation of self was fiction. Here the form was not autobiographical, and so he could affirm, rather than disguise, his utter sincerity. He did, however, undertake to forestall the doubters by anticipating their superficial condemnation. "The critic, turning over the uncut pages, will with unerring judgment settle the character of this book off-hand: 'wanting in all historic spirit;—the lines limp, being rather prose than verse;—the subject is one far too close to most men's hearts to be thus treated;—the writer is evidently *callow* both in life and thought.' "[54] With his disclaimer, according to a close friend who knew of the project throughout its maturation, he gave himself away. "Don't expect to pass undiscovered. I will and have been as silent as Death but the first man that reads the preface will know who wrote the book—I mean the first of your Cambridge friends."[55] Indeed, the author was found out almost immediately.

The play begins with a "Prologue in Chaos," narrated by a "Spirit of Negation" and "demons" of lust, ambition, and doubt, in a form modeled on Goethe's *Faust*. The Jesus of the play is to be tempted by these three forces to abandon his great mission. It is crucial that Jesus be thoroughly human, even if he will not for many centuries be recognized as such, so that, as the fable of his divine paternity dissolves, he can stand for "man's divinity." This human Christ was informed by such naturalistic biographical accounts as that by Ernest Renan, one of Pearson's favorite authors, whose Jesus had renounced politics, had taught a religion of the heart rather than one of formal observances, and had been able to achieve a "sweet union of ideas" with women.[56] Pearson's Jesus, however, nurtured ideals and anxieties modeled most closely on those of the author himself. His life was plagued for many years by indirection, testing the faith of all but his mother. His self-doubts, identified by the three demons, form the principal topic of the text.

Jesus is tempted least by the demon of ambition, represented unsympathetically by Judas, who gives up in frustration when Jesus refuses to lead the revolution that will bring earthly power. In the language of Pearson's ethical-religious writings, Judas represents the "enthusiasm of the marketplace," which prefers to act precipitously rather than to think. One of the pharisees, in a moment of wisdom, observes that the revolutionary potential of the "proletariat" is no creation of a heroic leader but the conse-

[54] *Passion-Play,* v.

[55] Conway to KP, 22 June 1882.

[56] *Passion-Play,* 12. Ernest Renan, *The Life of Jesus* (1863; Garden City, NY: Dolphin Books, n.d.), 113, 132, 236, 273. Another influential naturalistic account of the life of Jesus, also known to Pearson, was published anonymously by the Cambridge historian John Robert Seeley: *Ecce Homo* (Boston: Roberts Brothers, 1866).

quence of "a fever in the age." Jesus refuses to act as demagogue but is always an intellectual, exalting "mental work" as "God's vocation." He prays to a philosophical, Spinozistic God, who "Through endless time dost contemplate / Thine own perfection in the Universe."[57]

Self-doubt is represented by a cobbler, Nathan, whose crusty cynicism was the result of disappointment in love. Nathan is the anti-Schwärmer, who scoffs at the spirit of enthusiasm even as Jesus celebrates it. He will have nothing of the intellectual life, nor can he credit the possibility of achieving great things on earth. He supposes that at bottom all men are egoists. While the maelstrom swirls around him, he stays in his shop and tends to his hammer. At the scene of the crucifixion, however, he at last is moved by this man Jesus to recover his faith in the possibility of love.[58]

Love, indeed, is the most urgent problem of this book. The demon of lust is represented in the play by Mary Magdalene, who in the time of the play is more or less a harlot. She wants nothing of marriage, insisting that love must be free. She is bored with the common run of lovers and is delighted by the challenge of this holy Jesus.

> These are my weapons, naught but womanhood,
> Yet armed with these a woman rules the world;
> Fight must mean victory, and each fresh foe
> Must fall as Adam fell of old.
> I'll test this prophet's intellectual love. . . .
> I'll teach him life is brief, that youth
> Is briefer still, and briefest joy,
> So that its moments must in time be seized.[59]

Jesus, the holy one, should be made a woman's toy. Yet Magdalene soon proves herself no mere temptress, but a needed complement to the puritanical Jesus. The pure love he preaches at the beginning has no room for the sexual, which, indeed, he dreads. He fears there may be truth in the skeptical position that at bottom, love, even his love, is no more than sensuality. When she persuades him to meet her privately, she thinks her victory is gained. Instead, he brings her around to faith in his higher love.

At the same time, she vindicates the sensual to him. "Poor prophet man!" she tells him: "Acting an ideal, while the soul's consumed / By the same passion as the common herd's." As she is redeemed by his exalted ideals, so she rescues him from the torture of desire denied. These earthly needs, she explains—to eat, to drink, to sleep—must be fulfilled, if one is to think of higher things. Although we might infer from Kegan Paul's

[57] Passion-Plays, 99, 102, 168, 73–74, 50, 91.
[58] Ibid., 18, 30, 38, 153, 201.
[59] Ibid., 22, 36. "Intellectual love" is an allusion to Spinoza.

comments that there was a scene of consummation in an early draft, there is none in the printed version. Still, Jesus and Mary Magdalene come to epitomize a union of spiritual and sensual love, even if the corporeal appears principally as a means to a higher end. It is to be achieved on Earth. In the concluding couplet, the crucifixion is made symbolic:

> O men! The god in him ye crucify!
> Your sons the man in him may deify![60]

Pearson's passion play thus turned the religious idiom back in the end to worldly concerns, to social problems of his day as well as to personal anxieties about the moral life. The concerns about sexuality, purity, and friendship between the sexes, expressed here in the guise of fiction, would move Pearson three years later to form his "Men and Women's Club." His admiration of Hamerling's historical fiction and his authorship of a modern passion play reveal his passionate commitment to the union of renunciation and enthusiasm, a secular teleology of social activism that he wanted more and more to ground in an ethic of science. But what were the proper limits of self-denial? As a personal fantasy, his passion play reconciled the higher calling of the moral life with joyous sensual experience. In his life, and in his stern view of science, the problem of detachment was not so easily solved.

The play is also about applying lessons from study of medieval culture to the needs of the present. This work drew from his earliest serious historical research and gave direction to his subsequent efforts. It was emblematic of the distinctive voice and original arguments he would cultivate in researches spanning most of the decade of the 1880s. The need was to rescue faith and ritual from the degradation of modern economic materialism, while expanding the role of science as a foundation of social morality and political justice. At the same time, man must be released from the egoism of a capitalist economy and of a sexual system that degraded women. This seemed a worthy calling for a Schwärmer and renunciant.

[60] Ibid., 59–60, 65–66, 120, 201; last lines spoken by Nathan.

CHAPTER FIVE

Cultural Historian in a Political Age

> That it is impossible to sympathize with dogmatic faith breaking into the intolerance of ignorance is in the nineteenth century a truism; but there is an historical sympathy which recognizes that a positive evil of the present may have been a great formative force in the past, and, as such, a valuable factor in human development.
>
> —Karl Pearson in *The Athenaeum,* 1885

LATE IN LIFE, in his study of Galton, Pearson would claim that biography was the richest form of history. But he also was drawn to history as biography, the development of Germanic peoples as the formation of his own culture. The progress of any people possesses a logic of its own, a continuity that could rarely be broken by forces from outside, and its possibilities for the future were contained within its own past. In the German Middle Ages he found a background of popular socialism, sustained by folk rituals and linked to the Catholic faith, which stood in many ways as a model for what might be again. The intermediate stage of capitalist individualism was necessary but unfortunate, and Martin Luther's intolerant dogmatism had made it much worse than it might have been. Pearson was deeply historicist in his faith that institutions and beliefs now retrograde were once fruitful and progressive, and should be understood on their own terms. Such comprehension would then support a wiser engagement with contemporary issues and ideas, in an era that was pregnant, he supposed, with a new socialism based on science. He organized historical study into a distinctive program of knowledge and reform, of social and personal regeneration.

From his return to England in 1880 until he was appointed professor of applied mathematics at University College London in June 1884, Pearson's research interests were divided between mathematical physics and cultural history. Indeed, at the very time his permanent appointment finally came through, he was also under serious consideration for a position as lecturer in German literature and history at Cambridge, the field for which he was just then helping to design a syllabus. In May he had told Henry Bradshaw of King's College, alluding to the German position,

of his intention to "accept any post established (supposing the tripos scheme carried) which I should get a chance of." Seemingly he withdrew his application at the last minute for fear that the electors at University College, where he was teaching in a replacement position, might get wind of it and decide that he was still uncertain of his commitment to mathematics. His choice owed as much to career considerations as to his intellectual commitments, and two years later he indicated again that he might sacrifice some income for the sake of his "love of German bibliography" if offered a suitable post. For years afterwards he continued to write and publish historical essays involving very serious study. Only with his turn to statistics in the early 1890s was history reduced definitively to an avocation for him.[1]

In retrospect, to those who know how Pearson's career turned out, the idea that he might have become a historian of medieval and Reformation Germany may seem risible. But this is mistaken. His engagement with his historical subject matter was passionate, and his writings were deeply researched and startlingly original. His historical sensitivity and erudition show through even much later in his scientific reviews and essays. I would put my point more strongly: if we put aside what we know about his subsequent career in statistics and assess his work in mathematical physics through 1884 against his historical essays, it appears that the man was a born historian.

Pearson insisted that his immensely disparate writings of the 1880s were held together by a "unity of purpose and a similarity of treatment."[2] "The future Darwin of the history of civilization will probably recognize that his subject falls into two great divisions—the history of sex and the history of possession, into the changes in sex-relationship and the changes in the ownership of wealth."[3] This is, broadly, the division between the next chapter and this one, although in many respects the topics run together. The interest of these writings goes well beyond the field of history, whose Darwin he gave up hope of becoming, and extends to his statistical program. For the importance of Pearson's statistical efforts can in no way be reduced to the power and originality of his mathematics. His competence in mathematics was backed up with immense learning and a bold conception of natural science, philosophy, and history. Above all, he was a man with a vision of the role that his new field of applied mathematics could play in a reconstructed world. He wanted to tame the impulse to individ-

[1] KP to Henry Bradshaw, 12 May 1884 and 16 May 1884, King's College Archives; KP to Conway, 20 May 1886.

[2] Karl Pearson, "Preface" to *Ethic of Freethought,* 5.

[3] Pearson, "Socialism and Sex" (1887), in *Ethic of Freethought,* 430.

ualistic egoism, to define a social order in which scientists and scholars, workers of the head, could advance the interests of a larger society, mainly those who worked with their hands. He would strive, gradually, to replace the chaos of capitalistic competition with an efficient, organized, and moral order under the rational administration of the State. Cultural history provided the idiom within which he first emphasized the primacy of the collective over the individual

To be sure, his ambitions for science in the new world of statistics did not simply follow from the social vision implied by his historical writings. He was perpetually in dialogue with himself and drew inspiration from a startling range of sources, some already influential, and some virtually unknown. As autobiographer and as historian, he wanted to believe that every stage of life, however strange, was incorporated into the next phase of progress. Although he often spoke as if he were defining the one true way, and although he was much more a synthesizer than a *bricoleur,* there remained deep tensions in his social and scientific program. No one could be expected to establish an enduring unity of idealist philosophy, cultural history, education and the molding of character, the woman question, ether physics, biological evolution, mathematical statistics, and state socialism. What Pearson did was to gather up and refashion the contradictions. The statistical and eugenic program of his maturity was both a fulfillment and a rejection of the moral vision worked out through his engagement with history.

Historical Choices

King's College already stood for a historical school when Oscar Browning returned there, one year after Pearson arrived as an undergraduate. It was identified at first with the name of George Prothero. Although Browning and Prothero did not get along, the reputation of the college grew in subsequent decades. Pearson's friend Robert Somervell, who took honors in history and later pursued it as a profession, recalled Prothero as a painstaking lecturer who aimed mainly to prepare students for examinations. Being a new subject, he continued, modern history was taught by men "who were anxious to give it a 'scientific' aspect. . . . We almost got the impression that accurate and well founded statements of facts, logically put together, was the ideal of historical writing." Indeed, the new *English Historical Review* announced in 1886 that "the object of history is to discover and set forth facts." Of the *Cambridge Modern History,* in which Prothero took a leading role, Somervell recalled that some sections "are just fair specimens of what can be done by the outpouring of well filled

note-books."[4] Pearson's ideal of historical science was irreconcilable with this one.

Browning was still less suitable as an intellectual model than Prothero. His autobiography reveals a consummate gadfly and dilettante. He collected famous people, boasting of friendships with Walter Pater, George Eliot, Lord Tennyson, Robert Browning (no relative), Hermann von Helmholtz, Emil du Bois-Reymond, John Henry Newman, Lord Acton, and Oscar Wilde. He was particularly proud of his distinguished students, among whom he numbered Pearson as well as George Curzon and Gerald Balfour. Formerly a Cambridge Apostle, as a don he organized activities for the Apostles, contributing, as Pearson sweetly put it, to the "plentiful supply of their annual fodder of hashed metaphysics & religion."[5] He traveled in style on the Continent almost every summer, taking in scenery, art, and music, and favoring just those locations that drew fashionable Englishmen. He was at Oberammergau with Curzon in 1880, and as a patron of the Wagner Society he got to attend the first performances at Bayreuth.[6] Pearson's cultural refinement, incidentally, seems not to have extended to music, on account of what Frank Taussig called his "stupid English ears," but in these years he was something of a Wagner *Schwärmer,* thereby lending indirect support to Mark Twain's assessment of the great composer.[7]

Browning's publications ranged widely over countries and periods. It was often criticized as superficial, and as perilously close to the line sepa-

[4] Somervell, *Autobiography,* 66–67; Harvie, *Lights of Liberalism,* 44. Somervell entered King's in 1878 at the age of twenty-seven. In a letter he called Pearson "the first *friend* I made at Cambridge." Somervell to KP, 28 Dec. 1882, Pearson Papers 859/2.

[5] KP to Oscar Browning, 3 Oct. 1879, King's College Archives. He was not alone in his disdain. Somervell, *Autobiography,* 70, reports declining an invitation to join the Apostles, as did his friend Arthur Clough. Their assessments provide a worthwhile corrective to the immense self-importance of this little club, as it shines through in the scholarship. On Browning and the Apostles, see Lubenow, *Cambridge Apostles,* 287–303; Levy, *Moore: G. E. Moore and the Cambridge Apostles,* 79–80.

[6] Browning, *Memories,* passim. The Oberammergau passion play is described in John Murray, *A Handbook for Travelers in South Germany and Austria,* 14th ed. (London: John Murray, 1881), 154, as "elaborately prepared and creditably executed."

[7] (Twain said Wagner's music is better than it sounds.) Frank Taussig to KP, 30 Dec. 1879, Pearson Papers 865/5. On Pearson and Wagner, see Fanny P to KP, undated May 1876 (she hopes they can see Lohengrin and Tannhäuser); KP to his sister Amy Pearson (later Hatton), 21 Dec. 1879, after hearing Tannhäuser, "which strange to say I enjoyed"; KP to Fanny, 12 July 1881, on experiencing "Wagner's music, black bread, black beer, and cheese" at the Heidelberg Schloss; also G. W. Prothero to KP, 9 June (1880?), Pearson Papers 821, on Pearson's appreciation of the Meistersinger. Later, Pearson advised William Archer, a prominent figure in British theater, on Tannhäuser, most likely on the folkloric aspects; see Archer to KP, 20 May 1883, Pearson Papers 628/1. A letter from de Castella to KP, 6 March 1882, Pearson Papers 654, implies that he then had plans to experience the Ring cycle in Bayreuth.

rating legitimate scholarship from plagiarism. He was well aware of these rumors. "Then, as now, at Cambridge, it was not so much the knowledge of any particular subject that gave a man a reputation as the certainty of his ignorance of other subjects. My notorious polymathy always prevented me from being considered a scholar."[8] Pearson upbraided him in letters for political and scholarly failings and exchanged pleasantries with friends about the likeness of Browning's physical corpulence to the "all-roundishness" of his intellect. Pearson could not have approved of Browning's preoccupation with politics in his historical writings. All this was compounded because he saw in Browning's dilettantism a distorted, or rather inflated, image of his own ever-shifting interests.

As Browning sank in his esteem, his attachment to Henry Bradshaw became increasingly close. Bradshaw is among the more enigmatic figures in this account. At his death in 1886, Pearson expressed immense affection for the man, calling him the closest friend he had ever had. He continued to speak this way of Bradshaw to the end of his own life, ranking him alongside the biologist Weldon as a source of inspiration and intellectual soulmate. Yet their correspondence, both sides of which survive, is modest in volume and mostly rather perfunctory, and Pearson's rare mention of Bradshaw in letters to family and friends contrasts with his frequent if somewhat derisive references to Browning. Their relationship was based primarily on personal contact, and seemingly became a close one during Pearson's residence at King's College after his return from Berlin. Pearson traveled often to Cambridge until 1886, and afterwards almost never. Bradshaw was something of a father figure for him, a guide and counselor during these years of turmoil and uncertainty.

Born in 1831, Bradshaw was descended partly from Quakers, but his father's marriage outside the faith meant expulsion, and he was raised in the Church of England. He had been tempted for a time by Tractarianism and ended up a moderate High Churchman, though in politics he was an advanced liberal. An Etonian, he spent most of his life at King's, and began working to reform it in the 1850s. As University Librarian at Cambridge he developed immense erudition about early modern publishing, so that he could, for example, trace the circulation of woodcuts and typefaces from visual evidence alone. His publications were few and tightly focused. Mostly he gave his knowledge away to undergraduates and other library users. Among those with whom he worked most closely was Pearson's close friend William Martin Conway, a Trinity student, who was sent off on expeditions to the Continent in search of images, and in the end made his career as an art dealer and historian. By the 1880s Bradshaw was beloved among King's undergraduates. He admired Pearson as one of those outstanding men "who go at truth because they can't help it," and

[8] Browning, *Memories,* 37.

who could make the future of the college. In response to Pearson's incessant self-doubts, Bradshaw praised his accomplishments and encouraged him to continue with both mathematics and old German.[9]

Bradshaw was at the center of a small circle of Cambridge historians who sought to write cultural history rather than to define their subject matter as politics. Pearson lauded his program for the history of publishing because it would make the region or district, and not the book, the main unit of scholarship. That way the history of books could be integrated with a broader study of regional peculiarities and harmonies, the history of a people. Bradshaw, according to Pearson, called this a natural historical method, by analogy to the biological study of varieties and species. Despite Pearson's professed indebtedness, there is only the slightest resemblance between Bradshaw's scholarly production and his own. That similarity is most evident in the book Pearson dedicated to Bradshaw after his death, on the image of Christ, and particularly the veil of Veronica, in the Middle Ages. There Pearson stayed very close to the details, the transmission of verses and images from text to text.[10] Pearson's command of sources on this level was otherwise apparent mainly in his critical reviews of scholarship. Bradshaw had sometimes visited Pearson at his rooms in London and accompanied him to the British Museum; "he showed me what the essentials of true workmanship must be."[11] But the specific inspiration for Pearson's understanding of the Reformation came primarily from German scholarship.

Lectures on Cultural History

Although cultural history was not quite unknown in England, its resonances in the late nineteenth century were overwhelmingly German, and Pearson often used the German term *Kulturgeschichte* rather than its English equivalent. Its most famous practitioner, in retrospect, was Jakob Burckhardt in Basel, who was interested in the art and literature of elites.

[9] Prothero, *Memoir of Henry Bradshaw,* esp. his letters to an unnamed correspondent (KP), 293–295; Bradshaw to KP, 26 Sept. 1882, Pearson Papers 642; Rothblatt, *Revolution of the Dons,* 224–227; Conway, *Episodes,* 46–48; Evans, *The Conways,* 59–60; Charles Waldstein to KP, late Feb. 1886.

[10] Pearson obituary notices on Henry Bradshaw in *The Athenaeum,* 20 Feb. 1886, 262–263; *The Academy,* 29 (27 Feb. 1886), 147–149; Pearson review of Prothero, *Memoir of Henry Bradshaw* in *The Academy,* 35 (2 Feb. 1889), 68–70; Pearson review of *Collected Papers of Henry Bradshaw, The Athenaeum,* July–Dec. 1889, 852–854; Pearson, *Die Fronica.* Pearson's letters to Bradshaw in King's College Archives and Pearson Papers 909/3 reveal very little of their friendship.

[11] *Speeches at a Dinner.*

More typically, however, cultural history focused on the customs and practices of the common people. In the 1840s, Karl Dietrich Hüllmann argued for a new approach to history that would encompass "the whole of humanity." He was particularly concerned with the urban life of the German folk, and wrote on such topics as guilds, festivals, dress, family life, drink, and crime. As a field, cultural history had a modest place in the universities. But it subsisted there in the shadow of those histories of politics and the state that conformed to the Rankean model. Cultural history was often written for a more popular audience or as a challenge to the primacy of the state. It tended to conservative skepticism of political and bureaucratic centralization and was associated, though not infallibly, with Catholicism. In the 1890s, Karl Lamprecht would scandalize the German historical establishment by linking cultural history to a record of progress through stages, following an economic logic and a broadly Darwinian model of competition among social forms.[12]

Lamprecht was not quite alone. Pearson, whose interest in history grew up along with his commitment to socialism and Darwinism, developed his program of scientific cultural history before anyone had heard of Lamprecht. He understood a properly scientific perspective to mean the recognition of general historical causes. The individual was by no means passive, but he saw great individuals as formed through a confrontation with their age, and as limited by its possibilities. Serious historical students, he wrote, "sighed in silence over Carlyle's 'Hero-Worship.'"[13] Pearson regarded political history as mostly superficial. The sources of progress were of a different order, primarily economic and intellectual. For the historical era with which he was principally concerned, the Reformation, this meant recognizing the centrality of religion. Even much later as an extreme eugenicist, when he was obsessed with the competition of race against race and state against state, he identified faith, knowledge, and social organization as the key elements of national efficiency. Cultural history did not mean singling out some particular factor as decisive, but recognizing how, in fitting together, the plural elements defined an age.

For three or four years after Pearson's return to King's in June 1880, German history and folklore were his dominant intellectual interests. Formally, however, he was studying for a legal career. In November, as he was preparing to return to London, he vowed "to strive by ordinary but not overpowering grind at law to sink into the muck and by 35 to be earning £800 a year and thinking of marrying." Although he persisted long enough to be called to the bar, he spent most of his time working at history, poli-

[12] Gilbert, *History: Politics or Culture?,* 46–48, 83–87; Chickering, *Karl Lamprecht,* 87–89, 213–214.

[13] Pearson review of Verres, *Luther* in *Athenaeum,* July–Dec. 1884, 729–730.

tics, and philosophy. In the fall of 1881 his father complained that he had now wasted three years and proposed criminal law as a "most interesting science." To which Pearson responded: "God! interesting science, rape murder & the pettiest of thefts can form an interesting science!"[14] Shortly afterwards he accepted a position in the chambers of a barrister he met through his father, Macrory, then almost immediately withdrew, professing his utter dislike of this work. Perhaps because he felt some compunction about his lassitude at law, he did not draw the allowance his father offered.[15]

Instead, he lived from his King's College fellowship and sought work as an extension lecturer. Extension teaching was a convenient if not terribly lucrative way for young Oxbridge graduates to support themselves while seeking a suitable profession. By the 1880s, such lectures were offered for the benefit of women as well as working men, and at the end of his first such course, all seven of the candidates who presented themselves for examination were unmarried women. Most students audited the lectures without pursuing a degree.[16] Pearson devoted some time to mathematics in 1882 and 1883 and continued to gesture at law, but his rhythms of work were set largely by extension lecturing, which filled six months of the year, and by historical research, often in the British Museum.

Prior to his marriage in 1890, he journeyed for a month or more almost every summer to Germany and Austria. In July 1881 he discovered an ideal destination in the village of Saig, a minor Black Forest tourist spot that had no entry in his *Baedeker,* and where the landlady told him she had never before had an English guest. Perhaps in this mountain retreat, Parker advised him, he might "throw your arms around the infinite mother and find peace in her embrace." He devoted much of his time there to study and writing but also cultivated the peasants of this Catholic village, partly at least in order to experience through them the beliefs and speech patterns of a bygone era. For a holiday, though still weighted down by his books, he would set off on a tramp through the Austrian Tyrol, alone or with an English friend.[17]

He probably did not study cultural history until he began preparing extension courses. His first lectures focused on medieval German folklore

[14] KP to Parker, 23 Nov. 1880, 24 Oct. 1881.

[15] Macrory to KP, 11 March 1882, and William Pearson to KP, 16 Oct. 1882, Hacker Papers, Box 10.

[16] E. T. Cook to KP, 19 April 1882, transmitting report of London Society for the Extension of University Teaching dated 17 April. For lectures at Blackheath and Hampstead a year later he was paid a total of £55. Hacker Papers, Box 10.

[17] KP to Parker, 16 July 1881 and 31 July 1881, and Parker to KP, 20 July 1881; also, in general, his summer letters of the 1880s to Parker, to Elisabeth Cobb, and to his mother. In response to criticism of his review of work on German Bible translation before Luther, Pear-

and mythology, and for a time he envisioned a book on the topic. But in the spring of 1882 he started to work up a course on the Reformation. He inquired to an acquaintance from Saig, one König, who recommended two Catholic authors on the Reformation, Johann Joseph Ignaz von Döllinger and Johannes Janssen. Janssen had by then completed three thick volumes of what was to become an eight-volume history of modern Germany, bringing the story from the "waning Middle Ages" to 1555. König's letter characterized Janssen as "extrem katholisch," and he agreed, yet he was deeply impressed by the synthetic richness and originality of argument in this monumental study. Despite his occasional complaints about Janssen's partisanship, Pearson endorsed and developed his basic arguments and defended his book against Protestant critics.[18]

Although Janssen had entered the priesthood in 1859 and regarded his meeting with Pope Pius IX in 1864 as a high point of his life, he refused the party label and insisted always on his historical objectivity. In a foreword dated December 1879, a year after the completion of his first volume, he explained that he had decided in 1854 to write a popular German history for the educated public, in accordance with the new cultural-historical approach. This meant avoiding the preoccupation of earlier histories with wars, battles, and actions of state. Instead he would examine the conditions and the destiny of the German folk, their education, religion, science, art, agriculture, crafts, trade, and economy. He had now spent a quarter century in Frankfurt laboring at his task. His only aim was to convey historical truth, he said, and he knew himself to be free from every other tendency. For this work, he was happy to rely on solid monographs written, in most cases, by Protestant researchers who stood above party.[19]

This last point was perhaps more hopeful and even defensive than descriptive. Janssen wrote and published his first volumes from under the shadow of Bismarck's anti-Catholic *Kulturkampf*. Having initially welcomed the new *Reich,* he soon was disillusioned by its unrestrained free trade, political coalitions, atomistic head counts, sovereignty from below, attempts to make the capital like Paris, and general moral decay, as well as its attacks on the Roman church and its secularization of state, schools,

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son wrote that he had "passed some considerable time among the German peasantry, and I have been delighted to find them still using words and phrases which occur in the old pre-Lutheran translations." Karl Pearson, "German Translations of the Bible before Luther," *The Academy,* 28 (26 Sept. 1885), 199, and 10 Oct. 1885, 240–241.

[18] König (first name unknown) to KP, 12 May 1882, Pearson Papers 737/2. On his folklore project, Parker to KP, 21 Nov. 1880.

[19] Pastor, *Johannes Janssen,* 39, 41, 46; Johannes Janssen, *Geschichte des deutschen Volkes, seit dem Ausgang des Mittelalters,* 8 vols., (1878–1894), vol. 1 (6th ed., Freiburg im Breisgau, Herder'sche Verlagsbuchhandlung, 1880), Vorwort, dated 8 Dec. 1879.

and marriage. He was, in sum, distressed by modernity, hearing in it echoes of the Reformation period, or conversely. Still, as a historian he advocated *Wissenschaft,* and his work was at first welcomed by most reviewers. Later the Protestant historical establishment organized against him. Pearson commented acidly in 1884 on the "'Verein für Reformationsgeschichte,' which may shortly be described as a society for the suppression of Janssen and the perpetuation of the Luther myth"—a line picked up by Janssen's biographer.[20] Janssen's most vocal opponent was Julius Köstlin, author of the standard contemporary Luther biography, who complained that Janssen had unjustly portrayed the reformer as the destroyer of German prosperity, a fainthearted ally of revolutionaries, and an almost pornographic writer on sexual matters. Köstlin was particularly affronted by the attractive appearance and energetic style of this insidious treatise, designed to seduce unwitting Christmas shoppers, including Protestant ones.[21]

Indeed, this powerful synthetic account offered a dim view of Luther and of the Protestant Reformation generally. The late Middle Ages was a time of unparalleled flourishing of cultural, intellectual, and economic life. The benevolent role of Catholic faith and institutions was decisive throughout, whether as sponsor of universities, inspiration for popular festivals such as passion plays, or framework for the moral economy of the "old socialism." It was a system based on mutual obligation and brotherly love and on urban self-government, providing far more favorable conditions for working people than they would experience under sixteenth-century conditions of feudal bondage and absolutist government. While admitting certain shortcomings of the period, such as the widespread hatred of Jews, he declined to see corruption and decay as typical of the last decades before the Reformation. On the contrary, the end of the fifteenth century was a remarkable *Blüthezeit,* a cultural and economic efflorescence. Indeed, this very prosperity brought luxury and corruption, and the growing international trade of the Hansa posed a threat to moral relations. Also, humanistic reverence for pagan antiquity, as of Erasmus, tended to undercut "Christian-German" institutions. It was especially the rationalizing, universalizing tendencies of Roman law, welcomed by princes in their efforts to secure greater control over their territories and to gain autonomy from the Holy Roman Empire, which undermined the old system. These moves to princely absolutism had been assisted by uni-

[20] Pastor, *Johannes Janssen,* 63, 104; Pearson, review of Verres, *Luther, Athenaeum,* July–Dec. 1884, 729–730. I suspect he sent the review to Janssen.

[21] Chickering, *Lamprecht,* 89; Dickens and Tonkin, *Reformation in Historical Thought,* 183–184; Julius Köstlin, *Luther und J. Janssen: Der deutsche Reformator und ein ultramontaner Historiker,* 2d ed. (Halle: Max Niemeyer, 1883), 3, 22–23, 49–50, 70.

versity law professors and opposed by the Church. Grasping princes permitted a somewhat disreputable Martin Luther, with his rather petty objections to the Church, to provoke a schism and then a revolution, which threw the whole system into turmoil and brought decline and misery to Germany.[22]

Pearson acquired Janssen's first volume as soon as it was recommended to him, and within two weeks he had written ninety-three pages of notes, interspersing long German quotations with commentary in English. He regarded the book in this first reading as in some way a vindication of Catholic morality, but objected that Janssen failed to show the essential continuity of the Reformation with its historical background. The folk must have been prepared by a "vast religious working before Luther, . . . bringing the people to a mood which made them earnestly religious & fit for the Reformation." Pearson was not yet, in the spring of 1882, so fiercely anti-Luther as he would soon become, and he thought the move to religious freedom must have been valuable in terms of science and learning: "The truth of the matter lies in the result, what has Catholic Europe done for culture since the Reformation?" (The undeniable achievements of Italy and France had been "in opposition to the Catholic Element.") In terms of the effects of the Reformation on working people, he supported Janssen wholeheartedly. Individualism had never helped workers, but had undermined the structures of cooperation and regulation that protected them. The obliteration of guilds had also destroyed a system of high-quality production. Pearson's notes reveal an admirer of Ruskin. It is now impossible to build a cathedral, he remarked. "Could a modern artisan do a gargoyle without pattern?" Janssen, in a line Pearson quoted, called the Reformation a "great catastrophe of history." Pearson concluded at first more ambivalently that it had created "enormous vigour in the intellectual life & utter decay in the *political*." It had given birth to "Communism," here identified as the "lowest form of Individualism not [the] highest form of Socialism."[23]

Döllinger was also important for Pearson, though not to the same extent. A theologian by profession, he came to be ranked among the most famous Catholic historians of his generation. He was known in England, partly through the influence of his student, Lord Acton. In his study of the Reformation, Döllinger was concerned above all with Luther's doctrine of justification by faith, which he saw as theologically and morally corrupt, and terrible in its consequences. Luther had contrived this element of theology as balm for a well-earned sense of personal guilt regarding deeds,

[22] Janssen, *Geschichte*. His second volume was issued in 1879, his third in 1881.

[23] Pearson, "Notes on Literature, Janssen's Reformation Vol I," dated 28 May 1882, Pearson Papers 85.

Döllinger thought. Its bankruptcy was revealed in the moral depravity of so many Protestants of the first generation, and still more compellingly in the strange conduct of schismatic sects in modern America.[24] Despite his devotion to the Church, Döllinger refused to toe the papal line. In 1861, as the papal territories were being lost to Italy, he argued at length that the temporal power of the pope was a comparatively late historical development and not necessary for the Church. A decade later, he issued reports on political maneuvers surrounding the declaration of papal infallibility, based on secret letters from Acton in Rome, and for this he was excommunicated. In these years he began to write of Luther as a German national hero despite his immense flaws, and to promote reconciliation between the Roman Church and the Protestant sects.[25] Pearson, however, knew his work mainly for its harsh criticism of the reformer and his movement.

Pearson's appreciation for these historians and his distinctive views on medieval and Reformation German history already shine through in his extension lectures on "German Social Life & Thought in the 16th Century," delivered in the fall of 1882. He introduced these lectures, which he wrote out in full, with a grand trajectory of progress, or evolution, beginning with the passage of humanity from the natural to the moral state. This was in a way the expulsion from paradise, but by eating the apple man had opened up new opportunities. Here Pearson paraphrased Hegel, defining "the history of mankind to be the development of man towards an ideal human freedom." Freedom meant and depended on knowledge, and progress had to be attained through painstaking evolution rather than by revolutions rooted in ignorance. The German Reformation and the French Revolution broke out when knowledge ran ahead of religious and political institutions, and similar imbalances would soon bring revolution to Russia. In this introduction, the Reformation figured as the necessary defeat of a great falsehood, "the then Roman church." Protestantism, however, created an unfortunate tradition of individualism whose results had lasted to the present day.

With the introduction behind him, the actual Reformation emerged not as a phase in a triumphal narrative, but as a tragic diversion caused by a shortsighted revolution whose consequences had lasted to his own day. If the phases of history were to be judged by the lot of the common man, the

[24] Johann Ignaz von Döllinger, *Die Reformation, ihre innere Entwicklung und ihre Wirkungen,* 3 vols., (Regensburg: G. Joseph Manz, 1846–1848), vol. 2, 687–694; vol. 3, 1, 239–240; Döllinger, *Kirche und Kirchen, Papsthum und Kirchenstaat. Historisch-politische Betrachtungen* (Munich: J. G. Cotta, 1861), 333–341; Acton, "Döllinger on the Temporal Power" (an 1861 review of *Kirche und Kirchen*), reprinted in John Emerich Edward Dalberg-Acton, first Baron Acton, *The History of Freedom and Other Essays* (London: Macmillan, 1909).

[25] Döllinger, *Kirche und Kirchen,* "Vorrede," xxx. On Döllinger's career and travails, Hill, *Lord Acton,* xxii–xxiii, 25–26, 36–39, 127–129, 228–235, 321–322; Dickens and Tonkin, *Reformation in Historical Thought,* 181–183.

order of the fifteenth century appeared an especially admirable one. Pearson, adopting Janssen's language, referred to it as the "old socialism." This was an age of communal determination rather than individuality. Everything, Pearson explained, was regulated: weddings, gifts, gossip, production, and prices. The successful craftsman could not flaunt his wealth in the streets, because dress and ornamentation were determined by one's station in life. At this cost to self-expression, medieval Germany purchased impressive benefits. Every person had a legitimate place in the eyes of the town. There was little opportunity for accumulation, with almost no poverty, and churches took care of what there was. He evoked an ordering of public and economic life wholly incommensurable with that of his own day. The medieval tradesman "performed not for the sake of profit, but under the notion of moral duty towards his fellows, a duty created by the advantages the community had conferred upon him." In consequence, there was no proletariat, and in contrast to the dull routines of the modern workman who produces only for pounds, shillings, and pence, the medieval one "was full of energy, artistic and intellectual." Religion, too, was not fixed by institutions, but was vibrant and creative, with guilds inventing their own saints and nurturing legends about their histories. The old system violated "all the laws of so-called political economy," since its agents were "ignorant of the modern gospel of economic individualism" and did not "tremble before the Demogorgon Capital."

Although Pearson admitted some failings of the Catholic Church in the waning Middle Ages, his view of it was now highly sympathetic. He celebrated its role as an institution of charity and as a support of the reigning moral socialism, which had been endorsed even by Luther. He offered a picture of medieval society as life without alienation, culture made whole. The Church was not an autocratic institution, standing outside society, but was thoroughly assimilated into folk life. The objects of religion were not remote and transcendent, but facts of everyday experience. Art, though overwhelmingly Christian in content, was civic, the property of the folk, and the interior of a cathedral was an "open museum." Albrecht Dürer's virgin had the appearance of a German hausfrau, with nothing of the transcendent.

To be sure, these peasants and townsmen did not live wholly outside of historical change, for a spirit of individualism was ever more visible in the art of the period. But this, in itself, was healthy, part of the progress of history toward freedom. The late fifteenth century was, for Pearson, a time of extraordinary cultural richness, evident in the discovery of the ancient Greeks, the expansion and reinvigoration of German universities, and the efforts at reform by Erasmus and the great humanists. Printing was part of this movement, more symptom than cause of the new spirit of inquiry. Against Janssen, he celebrated progress, and he criticized Catholic historians who blamed humanists for the disorder of the sixteenth century.

Humanism was part of a healthy evolution, which, sadly, had been diverted by Luther onto the path of revolution.

How could this have happened? Pearson's historiographical perspective was social and cultural, not individualist, and he denied absolutely that history was made by great or terrible individuals. His dislike of Luther perhaps burst the bounds of these maxims. Yet he did offer context for the revolutionary transformation of Germany, following broadly the interpretation of Janssen. In the background was growing world trade, a struggle for wealth that created the beginnings of a proletariat. The breakdown of moral socialism owed much to the luxury and corruption brought by fifteenth-century prosperity. Still, in these days of the Hansa, even trade was controlled by guilds, and its disruptive effects were limited. The collapse of Catholic socialism began in earnest with princely efforts to replace the old German law, made and enforced by the folk, with a codified Roman law, controlled by rulers and administered by paid advocates. The separation of law from folk culture was a bid for power by grasping potentates, and an instrument of oppression. Lutheranism, too, triumphed in the context of princely absolutism, which now would increasingly gain control of the churches. Pearson, however, emphasized most strongly Luther's fanatical superstition and his demagogic appeals to the ignorant masses, which had led to chaos and war, the destruction of German culture and learning. It was not a reformation, but a deformation: the "Deformation Age." Its effects were still being played out in the contest of his own day between individualism and its "excrescence," communism.[26]

These were learned lectures, full of detail and intricately argued. Although he spoke admiringly of Carlyle on the French Revolution, his syllabus was supported mainly by references to German scholarship and to original sources, such as police archives in south German towns. Some reassuring letters from friends and family suggest that these lectures were too difficult and scholarly to be altogether popular. Still, his historical purposes spoke directly to the concerns of the present. He likened the struggles of the Deformation Age to the modern conflict between capital and labor, which might either bring an advance to a higher socialism or destructive revolution. "Two great Church parties representing irreconcilable theological conceptions, between them the party of culture and of gradual educational progress—two great economical schools reflecting the same general ideas in the industrial world—such are the factors common to both centuries," the sixteenth and the nineteenth.[27] And the outcome

[26] Karl Pearson, course of ten lectures, delivered at Blackheath, 1882, on "German Social Life and Thought in the Sixteenth Century," Pearson Papers 47/3.

[27] Pearson, unsigned review of *First Principles of the Reformation, Athenaeum,* Jan.–June 1884, 146–147.

of the modern economic struggle must be a return to some of the values of the medieval church:

> There are genuine human passions—desire for class organization, for unity of thought, for the spiritual side of the vulgar business of life—to which mediaevalism essentially appeals. The modern revolt against individualism brings those passions again prominently to the fore; it is leading to a new catholicity which will adopt mediaevalism as an element of culture, not as a dogmatic faith. The renascence of the nineteenth century will be as potent as that of the sixteenth, but it will add to its Hellenism the very thing the sixteenth century relentlessly destroyed—the spirit of mediaeval thought and art.[28]

This was the spirit of Catholic socialism, which must form an element of the economic system that is to come.

Historical Socialism

Although he was not exactly a rabble-rouser, Pearson had asked for absolute freedom to define the content of his lectures. He was lecturing as a radical socialist, and supporting a contemporary political movement that in turn had helped to form his views. He gave several courses of lectures at Blackheath and Hampstead and was invited to repeat some of them at the South Place Chapel in Finsbury. The governing authorities of the extension movement, it seems, willingly provided a forum for such expression. The adult-education movement was one of the principal vehicles by which socialist ideas were transmitted to workers.[29]

At Cambridge, socialism was almost unknown in 1879 and commonplace by 1883. London, however, was still more exciting for political radicals, and Pearson became familiar in radical circles in the early 1880s. His rooms at Inner Temple, where he lived with Parker and sometimes Conway from 1881 through 1885 and then alone until 1889, gave him ready access to bohemian London. He began associating with Bernard Shaw by 1880, if we are to believe his recollections.[30] He published translations from German of "Songs of the Proletariat" in 1881, and he was involved

[28] Pearson, unsigned review of Reginald Lane Poole, *Illustrations of the History of Mediaeval Thought, Athenaeum,* Jan.–June 1885, 148–149.

[29] KP to William Martin Conway, 10 Dec. 1881; on his anxieties about the success of his lectures, KP to Fanny, 1 March 1882, and Fanny to KP, 5 Oct. 1882; the South Place invitation came from Conrad Thies (Pearson's cousin) to KP, 22 Jan. 1882, Pearson Papers 868/1. On adult education, see Lynd, *England in the Eighteen-Eighties,* 284.

[30] "Do you remember how you pulled the tub from under me in 1880?" he wrote Shaw in 1921, without explaining to what he was referring. KP to Shaw, 22 June 1921, Shaw Papers, British Library 50518 f. 265.

in such activities as Sunday concerts of the German Social Democratic Club in Soho. A decade later he reminisced to Parker about their participation in "Socialists' & Workmen's Clubs & I was reading Lassalle's speeches & life."[31] Although little record of these activities survives, his publications alone suffice to demonstrate his attendance at the rebirth of British socialism.

The early 1880s marked a sea change in British class politics. This was the beginning of a labor movement, encouraged in many cases by middle-class activists and intellectuals, that was to lead to an identifiable working-class politics and then to a Labour party in the 1890s. Modern social history has shown peaks of unemployment in 1879, and again from 1884 to 1887. Contemporaries inclined more and more to see the whole period from 1873 as a time of joblessness and unacceptable hardship. The Hyde Park riot in February 1886 and Bloody Sunday in November 1887 made the general discontent evident to everyone. This unrest, along with falling agricultural prices and land values, led to a steep decline in the political power of the landed aristocracy over the decade of the 1880s, just as the new system of competitive examinations was weakening their position in the Civil Service. A Reform Bill in 1884 granted the franchise to most adult males, part of a new liberalism that endeavored to separate out the respectable poor, who would be allowed a voice in politics, from the "residuum," who would be treated more harshly.[32]

Socialism became increasingly attractive in this context to middle-class radicals. W. H. Mallock followed a British conservative tradition that went back to Edmund Burke in attributing socialism to misguided theories. He was not entirely off the mark. Organized working-class socialism was still almost invisible when Mallock called it a "commonplace . . . that we are surrounded by a spirit of social revolution."[33] The Democratic Federation, later Social Democratic Federation, was founded in 1881 by H. M. Hyndman, a Trinity man, who had experienced an epiphany while reading Marx's *Capital* in French translation on a business trip to Utah. English Marxists were from the beginning an idiosyncratic lot, and Marx himself disapproved of most. Hyndman argued from utilitarianism rather than di-

[31] "K. P.," "Songs of the Proletariat, I" and "II," *Cambridge Review,* 2 (18 May 1881), 335, and 1 June 1881, 367, respectively; KP to Parker, 24 Sept. 1893.

[32] Thompson, *Rise of Respectable Society,* 30; Hoppen, *Mid-Victorian Generation, 1846–1886;* Jones, *Christian Socialist Revival,* 31–41; Cannadine, *Decline and Fall of the British Aristocracy,* 25, 238–244; Jones, *Outcast London,* 290–303.

[33] W. H. Mallock, "Socialism in England," *Contemporary Review* (1883), reprinted in *Property and Progress: or, a Brief Enquiry into Contemporary Social Agitation in England* (London: John Murray, 1884), 85, a review of two books by Hyndman. He said of Marx in 1881 that his method was "in a position like that of Thales. I quite admit that he is a great collector of facts, but he does not know how to read them." Mallock, "Civilization and Equality," *Contemporary Review,* 40 (1881), 651–672, on 660.

alectic and was nationalist in his politics. Belfort Bax sought in socialism a basis for religious or metaphysical meaning. William Morris, who joined the federation in 1883 and then withdrew at the end of 1884 to form his rival Socialist League, was interested in the dignity of labor and the restoration of authenticity and craft.

E. P. Thompson's evocative and deeply romanticized biography of Morris argues that the poet was rescued by the vigor of Marxian commitment from the decadence of medievalist aestheticism. It is a questionable interpretation. Morris, while distinctive in his ideas and ambitions, was typical of these early British socialists in his preoccupation with the distant past. He and others looked to the medieval period for values that must be restored in a socialist future.[34] There was in the Middle Ages, wrote Brougham Villiers, "more, both of theoretic and what . . . I shall call organic Socialism in England than during the first three centuries of Protestantism." Catholic sympathies were common among British socialists. Beatrice Webb wrote in her autobiography that the Comtean positivist Frederic Harrison had taught her "to resist the current depreciation of the mediaeval social organisation" as he "emphasized the real achievement in their own time of the Catholic Church and the craft gilds."[35]

Late medieval England was perhaps also a model of economic prosperity. In the early 1880s, the economist Thorold Rogers charted the real value of wages over six centuries, and concluded that the conditions of English laborers were never better than in the fifteenth and early sixteenth centuries. They had been reduced to poverty, he thought, by deliberate actions of Parliament. The medieval church, by contrast to the institutions of state, had conferred great benefits on mankind, despite its deplorable superstitions. This was a more moderate version of a bitter argument made in the 1820s by the Irishman William Cobbett, who blamed the Reformation for the descent into penury of the laboring population. Hyndman, in 1883, invoked "common consent" for the superiority of working conditions in the fifteenth century over any other, before or since. "Merry England it was then in spite of all its drawbacks."[36]

[34] MacCarthy, *William Morris,* 464; Schorske, "Quest for the Grail"; Pierson, *Marxism and the Origins of British Socialism,* 64, 97. On decadence, see Thompson, *William Morris;* cf. Morris, *News from Nowhere* (1890).

[35] Brougham Villiers, *The Socialist Movement in England* (London: T. Fisher Unwin, 1908), 19; Beatrice Webb, *My Apprenticeship* (1926; London: Longmans, Green, n.d.), 125 (referring to the early 1880s).

[36] James E. Thorold Rogers, *Six Centuries of Work and Wages: The History of English Labour* (New York and London: G. P. Putnam's Sons, 1884), 4–6, 326, 357; William Cobbett, *A History of the Protestant "Reformation" in England and Ireland* (London: Charles Clement, 1824–1827); Letter 1, para. 4; Letter 2, para. 37: "It was not a *reformation,* but a *devastation,* of England." H. M. Hyndman, *The Historical Basis of Socialism in England* (London: Kegan, Paul, Trench, 1883), 1; Morse, *High Victorian Culture,* 80, mentions Cobbett as among those who disputed the Whig interpretation of English history.

Marxian socialism, in the heterodox form of the Social Democratic Federation, was only one among many rival programs to reorganize the English future that circulated through London in the 1880s. Charles Bradlaugh's secularists were in competition with positivistic followers of Auguste Comte, advocates of a religion of humanity. They contended and overlapped with Oxford Hegelians, lapsed Unitarians, theosophists, agnostics, Spinozists, and anarchists. Many, including Pearson, advocated what John Morley of the radical *Fortnightly Review* called an alliance of "brains and numbers," the guidance of the masses by their educated sympathizers.[37]

Most of these programs of reform involved an explicit religious dimension, generally framed as an alternative to orthodox Christianity. One leading source of the Fabian Society was the "Fellowship of the New Life," founded by the pro-Catholic American Thomas Davidson, who looked to achieve utopia through the personal regeneration of its members. The other was a Marx reading group, organized by the Hampstead anarchist Charlotte Wilson, who had been a particular admirer of William Morris before she shifted her allegiance to Prince Kropotkin. Annie Besant came to Fabianism from the secularist movement, and left it in 1890 for Madame Blavatsky's theosophy. Shaw was also concerned with religion, at least for its social function, and tried his hand at a racy passion play in one of his earliest literary efforts. In 1890, he and Sidney Webb, two of the leading Fabian socialists, experienced Parsifal at Bayreuth, then proceeded to Oberammergau for the passion play.[38]

Pearson knew and corresponded with all these people, especially Shaw and Wilson. Wilson asked his advice about reading Marx and sought to justify to him her wonderfully sunny view of human nature (so long as it was uncorrupted by social inhibitions and restrictions) that called for a union of "complete animalism" and "higher spiritualism," and made anarchism the only moral system of politics. She solicited his participation, within the space of a single year, in her Karl Marx Society, then in the Fabian Society, and finally in her "Russian Society."[39] His reply to the last invitation stimulated her to send him two books by the assassin and London refugee Sergius Stepniak, which Pearson forthwith praised in reviews. Stepniak's account provoked him to set aside his customary nonviolent gradualism and to defend the need for political, if not social, revolution in that terrible Russian police state.[40]

[37] Harvie, *Lights of Liberalism,* 11; Kent, *Brains and Numbers.*

[38] McBriar, *Fabian Socialism and English Politics,* 1–3; Wolfe, *From Radicalism to Socialism,* 172–175; Peters, *Bernard Shaw,* 51; N. and J. MacKenzie, *The Fabians,* 138.

[39] Charlotte Wilson to KP, 22 Oct. 1884, 28 July 1885, 8 Oct. 1885, Pearson Papers 900. She wrote him at least forty-eight letters from 1884 to 1896.

[40] Hulse, *Revolutionists in London,* 29–52. Sergius Stepniak wrote twelve letters to Pearson beginning 1885; see Pearson Papers 861/7. He came to a meeting of the Men and

Pearson's participation in the Social Democratic Federation was limited to his publication of a popular lecture on women and socialism in its magazine, *To-Day,* which he was urged to write by the editor J. L. Joynes, a Cambridge acquaintance. He never even met Morris, whom he admired, though he had the opportunity.[41] Despite frequent appeals and invitations, he was too strong-willed and idiosyncratic to join anyone else's movement. Instead he defined his own, which he called "freethought," as the intellectual and moral basis for the future. It had, as he conceded (or perhaps boasted) in 1888, about one member. He had to compete for the label with the shockingly sarcastic *Freethinker,* whose editor, G. W. Foote, was imprisoned in 1883 for such "blasphemies" as his cartoon of the "Carnivorous God" who rejected Cain's sacrifice. Pearson and most other middle-class reformers were unwilling to offend conventional opinion to such an extent, and they generally managed to stand above what was called lower-class vulgarity, sold for a penny. But it was no easy matter to redeem freethought from its associations with free love and other unsavory tendencies. Even the editor of the *Agnostic Journal,* which Pearson thought of doubtful propriety, identified freethought with scurrility and tried to keep his distance from it. Pearson believed the term to be worth salvaging as an alternative to "agnosticism" because he thought the latter term too pessimistic about the ultimate possibilities of knowledge.[42]

In addition to his extension classes, Pearson lectured to workingmen's associations and to such groups as the Sunday Lecture Society. That particular organization paid him £5.5 for a talk in 1885, which he then returned, despite a degree of impecuniousness, as a contribution.[43] The Sunday lecture

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Women's Club (discussed in chapter 6) in November 1886; see Maria Sharpe, "Autobiographical History of the Men and Women's Club," Pearson Papers 10/1. Pearson wrote two essays on Russia in the *Cambridge Review,* 7 (1885–86), and condoned political revolution in both, on account of police measures that made gradual progress impossible. Pearson, "The Coming Factor in European Progress," 21 Oct. 1885, 26–28; "The Russian Storm Cloud," 23 June 1886, 406–407. Stepniak's terrorism was not generally known in England, where he moved in 1883.

[41] J. L. Joynes (a friend of Bradshaw and of Morris) to KP, 29 Nov. 1883, Pearson Papers 731/2; John Henry Middleton to KP, 26 June 1888 and 27 October 1888, Pearson Papers 762/9. Middleton, who met Morris on his way to Iceland in 1873, lectured on domestic life and houses in medieval England as Slade Professor of Fine Art in Cambridge and then became director of the South Kensington Museum. He complained of the "filthy commercial pigs" who had "turned Rome into a hideous wilderness of stuccoed abominations, in comparison with which Gower Street is picturesque and even beautiful."

[42] Pearson, *Positive Creed of Freethought,* 3; Desmond, *Huxley,* 501. On *The Freethinker,* see Smith, *London Heretics,* 61–69, and, especially, Marsh, *Word Crimes,* chap. 3. On the *Agnostic Journal,* see Charles Albert Watts to Thomas Henry Huxley, 23 May 1892, Huxley Papers 28.199–200, Imperial College Archives, and Lightman, "Huxley and Scientific Agnosticism," 271–289.

[43] William Henry Domville to KP, Pearson Papers 864/8.

was by the late nineteenth century a well-established alternative to religious services, aiming to elevate the listener without appealing to the Christian God, or often to supplant Christian belief with a faith in science, philosophy, pantheism, Eastern religions, reverence for humanity, social service, or some other expression of moral seriousness in that New Age of expiring Victorianism. The experience of Beatrice Webb is revealing. Although raised as a Unitarian, she experienced religion as something immensely heterogeneous: "During the London season my father, accompanied by a bevy of daughters, would start out on a Sunday morning to discover the most exciting speaker on religious or metaphysical issues, and we would listen with equal zest to Monsignor Capel or Cannon Liddon, Spurgeon or Voysey, James Martineau or Frederic Harrison."[44] These preachers were, respectively, a Catholic, a liberal High Church Anglican, a Baptist, the founder of the church of theism, a Unitarian, and the English leader of Comtean positivism. Pearson sought out a similarly diverse experience of religion in early adulthood. He delivered his most inspirational and moralistic lectures at one of the outstanding sites of religious heterodoxy, the South Place Chapel in Finsbury, home of the South Place Religious Society, renamed in 1890 the South Place Ethical Society.

South Place was built in 1823 as a Unitarian chapel and remained so to the 1860s. Its first three preachers, beginning with William Johnson Fox, were rebels against hell-fire Calvinist upbringings. The third, Moncure Conway, was an Episcopalian from a slaveholding Virginia family who turned Methodist and then Unitarian preacher, afterwards leaving his Cincinnati congregation to edit an abolitionist paper in Boston. He encountered South Place while on an abolitionist speaking tour in England, and in 1864 was recruited to become its minister. Soon he began to substitute new kinds of inspirational readings, such as Eastern religious texts selected by Friedrich Max Müller, for passages from Scripture, and to describe his sermons as anthropological rather than theological. As some contemporary doggerel had it: "Religion, pious Carr rejoined, / in Moncure Conway's view / Is not devoid of interest / although it be not true." In 1878, Conway joined William Kingdon Clifford in organizing a "Congress of Liberal Thinkers" at South Place to bring together people from all over the world who shared the goal of liberating humanity from dogma.[45]

Conway was able to entice most of his congregation to follow him on this journey away from Christianity, and to increase it by attracting families that had lost faith in the traditional churches. There also were occasional visitors,

[44] Webb, *My Apprenticeship* (note 35), 48. She refers to Henry Parry Liddon, Charles Haddon Spurgeon, Charles Voysey, James Martineau, and Frederic Harrison.

[45] Most of this paragraph is from Ratcliffe, *Story of South Place*. The verse is quoted in Smith, *London Heretics,* 111. On the Congress, see Smith, *London Heretics,* 115, and Lightman, *Origins of Agnosticism,* 95.

such as Fanny Pearson, who was attracted by his lecture in late 1873 on John Stuart Mill. By the time of Karl Pearson's association with South Place, however, Conway was becoming restless. He took a nine-month world tour beginning June 1883, returned for a year, and then formally retired in 1885. For seven years the church was unable to find an acceptable replacement, until he decided to return in 1892. During the interregnum the pulpit was occupied by visitors, many of them scholars or men of science, who lectured on education, biology, emotions, materialism, toleration, literature, and culture.[46] However distinguished their ideas may have been, this arrangement was not entirely satisfactory, and the frustration of the members at being without a regular minister led to the consideration of some surprising candidates. Andrew Wilson, who often presided in these years, was too dry, and the congregation could not tolerate heresy from an unfamiliar voice, explained Annie Besant in a letter to Conway's wife in December 1885. "Mr. Pearson has been spoken of a good deal, but nothing seems to get settled."[47] It is intriguing to imagine Pearson making a career preaching freethought at the South Place Ethical Society.

He spoke three times at South Place, explicating there his secular religion of freethought in an effort to outline a new philosophy of science that might satisfy the yearnings of the age. In his first discourse, he defined religion as "the relation of the finite to the infinite," which, according to his exemplary South Place theology, is a "*necessary logical category,*" even if God has at best a contingent reality. The "Eternal Why" may haunt the mind of man, and in frustration at his failure to find a method of solution he "may be driven to despair, to pessimism, to absolute spiritual misery." Pearson aficionados will find this abstract being, "man," somehow familiar. Our man was able to obtain partial relief from spiritual misery in Buddhism, whose great merit is to concern itself with individual self-cultivation rather than with the gods. The favorite occupation of freethought, however, was science, which, following Pearson's aggressive idealism of 1883, promised someday to "unite all finite things of the universe" through a working out of the logic of mind. Meanwhile, however, it was among the great virtues of science to admit modestly its ignorance where ignorance remained, and to pursue knowledge with that enthusiasm—*Schwärmgeist*—described by "the greatest living German poet," Hamerling.[48]

[46] I was able to read thirty-five of these lectures from 1883 to 1892 in a bound volume held by UCLA under the title *South Place Lectures,* of which Pearson's "Ethic of Freethought" is the first. Fanny P to KP, 30 Oct. and 31 Oct. 1873.

[47] Ratcliffe, *Story of South Place;* letter from Smith, *London Heretics,* 118–119.

[48] Pearson, "The Ethic of Freethought," lecture at South Place Institute, 6 March 1883 (London: E. W. Allen, 1883), reprinted in *Ethic of Freethought,* 13–32. On Buddhism he referred to a lecture by his friend from King's, Rhys David, who became a Victorian authority on the subject.

In a subsequent lecture at South Place, on "The Enthusiasm of the Market-Place and of the Study," his emphasis shifted away from the metaphysical to the practical and moral significance of science. Morality is a question of knowledge, not of the emotions; the moral is simply what is social, and the immoral is antisocial. He declared bluntly that "the ignorant and the uneducated cannot be moral." Political issues such as vaccination should be answered by "general laws and particular statistics," not by those slogans of the marketplace, "human right" and "individual liberty." Yet this faith of the study, this cool intellection, required enthusiasm. Its missionary ambition was: "To convert the market-place into the study!" The dangers of failure were apparent from history, from the misery and destruction brought forth by ignorant fanaticism in the German (Protestant) and French Revolutions. Pearson thus preached of Luther as the paradigm of dangerous irrationality, inviting the ignorant to act before they think.[49]

Objectivity, Faith, and History

His emphasis on the similarities of his own time with that of the German Reformation had a precedent. The Oxford essayist Mark Pattison, whom he invoked as "one who was more capable than any other of scholarly criticism in this field," had commented that "thoughtful men, who can read the signs of our times, are becoming aware of the close analogy which the existing conflict of opinion bears to that which was going on in the times just before Luther."[50] Pattison referred to the upwelling of pre-Reformation reform efforts, as by Johannes Reuchlin in Cologne, which were thwarted by encrusted institutions. For English scientists and rationalists, it was customary to view Luther's revolt as a model for a progressive age, a spiritual challenge to entrenched orthodoxy. Huxley, for example, wrote in anticipation of Darwin's *Origin of Species* of "living on the eve of a new Reformation," which might in thirty years allow him to "see the foot of science on the necks of her Enemies." A decade later he announced the need for a "wider and deeper change" than that of the sixteenth century, a reformation of science that must be accompanied by political and social turmoil.[51] Pearson called for a deeper analysis and reinterpretation of this

[49] Pearson, "The Enthusiasm of the Market-Place and the Study," Sunday, 29 Nov. 1885 (South Place Discourses, No. 5), reprinted in *Ethic of Freethought,* 115–134.

[50] Mark Pattison, "Antecedents of the Reformation" (from *Fraser's Review,* 1859), reprinted in Pattison, *Essays,* 2 vols. (Oxford: Clarendon Press, 1889), vol. 1, 53–66, on 55, quoted by Pearson without attribution in a review of Charles Beard, *Martin Luther and the Reformation in Germany* in *Athenaeum,* July–Dec. 1889, 664–666.

[51] Moore, "Theodicy and Society," 177, and Lightman, "*Robert Elsmere* and the Agnostic Crises of Faith," 302; Thomas Henry Huxley, "On Species and Races, and Their Origin"

historical era, rejecting the Protestant biases that had distorted the scholarship, so that the evils of the enthusiasm of the marketplace might appear more clearly. Although he still held religiously to a doctrine of progress, by 1884 he was no longer so clear in accenting individualism or even freedom as the positive outcome of these historical processes. Now he saw the slow ripening of science, rather more than the demand for human freedom, as the force whose growth had required an end to the hegemony of Catholic theology. Luther's movement, however, set science back; it was no clarion call for intellectual freedom, but a retreat into deeper and more violent superstition. If Lutheranism brought greater intellectual toleration, it was only because these relentless schismatics could not agree on which heresies to suppress. And in the end Luther sided with the oppressors rather than the downtrodden in the battle for human dignity.

The historical lesson for the present in the German Reformation was brought out most clearly in Pearson's essay on the Anabaptists of Münster, originally published in 1884 in the *Modern Review.* In some respects he followed Hamerling's epic portrait of that historical event, perhaps above all in his depiction of what he called the "opposite poles of Anabaptist thought," namely, "spiritual and sensual fanaticism." When Jan van Leyden sacrificed his principles to the allure of the beautiful gypsy Divara and took her as his second wife, "sensuous pleasure" won a victory over "self-renunciation." This "plague-spot" of sensuality led soon to "sexual anarchy," and then to the final destruction of the Anabaptists from within. Pearson, of course, did not imagine that they had ever had any possibility of success, for real social advance is always gradual. Yet he sympathized with the plight of the common people. In view of the misery brought by the destruction of the old socialism, of the communal rights of a free peasantry and of independent handicraftsmen, the appeal of millennial change was understandable. Luther, promising a new gospel and a return to "brotherly love, mutual charity, and an apostolic simplicity of life," had instead only confirmed the "rampant . . . spirit of selfishness" of this grasping, materialistic age. No wonder that his erstwhile followers looked to create the new Zion on their own, drawing inspiration, as had so many radicals before them, from the book of Revelation. Their behavior was sometimes quite mad, as when Jan Mathys rushed out of the gates of the city to attack his enemies singlehandedly. He was a fanatic, his shining morals wrecked by ignorance. Still, his principles were right, for at least "he fought and died for a *spiritual* notion." The chief enemy of this revolution, the loathsome bishop, "fought and triumphed for himself." If such

(1860), in Michael Foster and E. Ray Lankester, eds., *The Scientific Memoirs of Thomas Henry Huxley,* vol. 2 (London: Macmillan, 1899), 388–394; T. H. Huxley letter, 1859, quoted in Desmond, *Huxley,* 253; Huxley letter, 1871, in L. Huxley, *Life and Letters of Thomas Henry Huxley,* vol. 1, 427–428.

disorderly episodes, repeated most recently in the Paris commune, were to be avoided in the future, the world must take responsibility to educate and "redeem from serfdom" the modern proletariat.[52]

Pearson's essay on the Anabaptists relied heavily on a study by Carl Adolf Cornelius, never completed, which Hamerling also had praised in the notes to his verse epic.[53] On the Reformation generally, Pearson pointed to German work as the standard of serious scholarship, against which most English historical writing stood condemned as slipshod. England needed research and teaching positions in medieval history, he argued, if it was to be rescued from antiquarian dilettantism. The nation could ill afford the appointment of a "brilliant but inaccurate *littérateur*"—he meant James Anthony Froude—to a distinguished chair in history.[54] Pearson was particularly fierce in 1883 when he condemned a Luther exhibition sponsored by the British Museum for its incompetent translations and the distortions implied by its selection of images. His asperity brought reproof from Bradshaw, who wrote to him of the "extraordinary absence of wisdom" of this review.[55]

The alternative to such amateurism, a really scientific history, would be based on an intimate familiarity with original and secondary sources, a competence that was far more widespread in Germany than in Britain. Pearson also insisted on the need for freedom from bias in historical research. He saw Protestant complacency in much of the scholarship, and he later admitted with respect to the British Museum that he had been even more vexed by the Protestant bias of the Luther exhibition than by its technical shortcomings. In this respect, however, the Germans were scarcely if at all superior to the English. "Although the entire method of historical research has in the last decade undergone a most marked revolution, we are still very distant from that glorious era when the emotionalist and the sectarian shall be prohibited from writing on historical subjects."[56] He tried to be evenhanded, and on occasion he condemned in general terms the biases of Catholic historians, or lamented that virtually all scholarship on his favorite topic could be readily divided by booksellers

[52] Pearson, "The Kingdom of God in Münster," in *Ethic of Freethought,* 314, 294–296, 263, 310.

[53] Carl Adolf Cornelius, *Geschichte des Münsterischen Aufruhrs,* 2 vols. (Leipzig: T. D. Weigel, 1855–1860).

[54] Pearson, "German Translations of the Bible before Luther," *Academy,* 28 (26 Sept. 1885), 199; Pearson review of Froude, *Life and Letters of Erasmus, Academy,* 46 (3 Nov. 1894), 343–344.

[55] Pearson, "The Luther Exhibition in the Grenville Library," *Athenaeum,* July–Dec. 1883, 368, 464–465; Henry Bradshaw to KP, 25 Oct. 1883, Pearson Papers 642. He allowed the letter to be published in Prothero, *Bradshaw,* 293–295; see also E. S. Pearson, *Karl Pearson,* 7.

[56] Pearson, "Luther Exhibition," 530–531; Pearson review of Bonet-Maury, *Early Sources, Academy,* 26 (13 Sept. 1884), 162–163.

into Protestant and Catholic. (He also listed the references this way in one of his own essays.) His sympathies, however, were clearly on the Catholic side, and it was the teleological arrogance of Protestant history that inflamed his wrath. Catholics, having benefited less from the propagation of legends about the Protestant split, could better afford to be honest, he thought. As he wrote in one of his earliest reviews, "The recognition that more fact and less myth will do *it* at least no harm is not improbably the source of the Vatican's appeal to history."[57]

Many of Pearson's historical reviews, including a series of unsigned ones in *The Athenaeum,* concerned the question of Bible translations. He condemned as pure bias the Protestant argument that vernacular Bibles were scarcely available before Luther. He inspected as many early Bibles as he could and became an erudite commentator on this subject, though his findings were expressed mostly as refutations. Far from being actively suppressed by the Church, vernacular translations had long flourished, beginning with the search for an alternative to papal authority during the "Babylonian captivity" in Avignon. Luther's translation was, for Pearson, no pioneering work, but the culmination of a process that already was on course to produce a standard "German vulgate." He denied that the pre-Lutheran translations were linked to heresies, insisting that the Church had countenanced them. Against much criticism from Protestants, and following the broad lines of Catholic scholarship,[58] Pearson held that Luther had neither time nor sufficient familiarity with Greek to have produced an independent translation of the New Testament. He supplied detailed textual comparisons as evidence that Luther translated with a vulgate before him. Indeed, Luther had introduced more errors than he corrected, often displaying thereby his theological biases. Pearson's chief concession was to recognize the vigor and fluency of Luther's prose. In all, he attacked Protestant doctrine on biblical translations in at least a dozen reviews.[59]

In other reviews and essays, and following the argument in his extension lectures, he worked out a negative view of the whole Reformation movement. Of course he did not defend his interpretation in the name of faith,

[57] Pearson, "Luther in the Archives of the Vatican," *Academy,* 24 (8 Dec. 1883), 373–374. On booksellers, see Pearson review of Konrad Lange, *Der Papstesel, Academy,* 40 (8 Aug. 1891), 109–110.

[58] E.g., Vincenz Hasak, *Die christliche Glaube des deutschen Volkes beim Schlusse des Mittelalters* (Regensburg: Georg Joseph Manz, 1865), iii–ix.

[59] *Athenaeum:* July–Dec. 1883: 368, 464-465, 530-531, 630-631, 809-810; Jan.–June 1884: 694-695; July–Dec. 1884: 400; Jan.–June 1885: 631; July–Dec. 1885: 140–141; July–Dec. 1887: 431–432; *Academy,* 28, 1885: 199, 292–293; 30, 1886: 84–85; 47, 1895: 238–239. The point about Luther expressing his biases in errors of translation was made by Döllinger, and then by Acton, "Döllinger" (see note 24), 349. The leading British authority on Luther, T. M. Lindsay of Glasgow, held that Luther's translation of the New Testament was "almost entirely his own work." See *Encyclopaedia Britannica,* 9th ed., vol. 15 (1883), s.v. "Luther," 71–86.

but of truth, and his own seeming partisanship no doubt made it all the more urgent to reiterate that his commitment was to science and objectivity. Such, indeed, was the tenor of these debates throughout the German scholarship on the Reformation, and such discussions provided the context for Pearson's initial emphasis on the disinterestedness of science. The preacher Vincenz Hasak, who decried the Reformation as a "great catastrophe" and prophesied that the near-heathenism of nineteenth-century "Enlightenment" would lead to social catastrophe, was particularly insistent: "God is my witness, that I have always wanted to give pure, objective truth." Wilhelm Maurenbrecher, praised by Pearson for his freedom from partisanship, revered the spirit of objectivity. "In this sense we promote objectivity for the Reformation period; in this sense we cast away all theologically partisan studies of Reformation history as a sin against the Holy Ghost of our historical science!" Maurenbrecher attributed the objective turn in historical scholarship to Leopold von Ranke (a Protestant), and credited this new ethic with a more judicious outlook on these historical conflicts, as opposed to the fanaticism on both sides a few decades earlier.[60]

Pearson was not impressed by the progress of objectivity in historical scholarship thus far, but he prescribed the same remedy. The British Museum Luther exposition, commemorating the four-hundredth anniversary of the reformer's birth, was defended by one Henry Jenner, who refused "to pander to the modern cant of unsectarian impartiality by vilifying as well as glorifying the hero of the centenary." Pearson held up a very different ideal. "The duty of the historian is neither to vilify nor to glorify; they must be no hero-worshippers, but endeavour to represent the man precisely as he was, and trace the effect of his conduct on the progress of the human race with 'unsectarian impartiality.'"[61] It would be difficult to say that Pearson always lived up to his own standard. He was sometimes more Catholic than the papists, as in a letter to the *Pall Mall Gazette* provoked by Matthew Arnold's praise of Luther. "Surely, does not Mr. Arnold know enough of history to be convinced that Luther and his movement destroyed all art, all literature, all commerce (if that be of importance), and all true religiosity?" Yet the principle retained all its validity. "Those who wish in our day to rank as historical investigators must renounce once and for all any party platform, whether it be Evangelical, Catholic, or Anti-

[60] Vincenz Hasak, *Dr. M. Luther und die religiöse Literatur seiner Zeit bis zum Jahre 1520* (Regensburg: Verlag Georg Joseph Manz, 1881), v–vii, "Schlusswort"; Wilhelm Maurenbrecher, *Studien und Skizzen zur Geschichte der Reformationszeit* (Leipzig: Fr. Wilh. Grunow, 1874), 224–228; also Maurenbrecher, *Geschichte der katholischen Reformation,* vol. 1 (Nördlingen: C. H. Beck, 1880), vi. Pearson praises Maurenbrecher in his review of Boney-Maury, *Early Sources,* in *Academy,* 26 (13 Sept. 1884), 162–163.

[61] Pearson, "Luther Exhibition," *Athenaeum,* July–Dec. 1883, letter by Henry Jenner, 496–498, and reply by Pearson, 530–531.

trinitarian." An "impartial" history, he summed up, will "paint Luther as the reverse of an apostle, but it will not defend the Papacy."[62]

In Pearson's interpretive essays on the Reformation period from 1883 and 1884, he drew heavily on German cultural historians, especially Janssen, refashioning their materials and their arguments along the lines of his own emerging perspective on history. Given the ubiquity of the forces of progress, any great institution requires adaptation and reform, and the late medieval Catholic Church was responsible for many abuses. Yet it also had had great virtues. Above all, "it produced a unity of feeling between all men, . . . it stood between workman and master, between peasant and lord, dealing out equity and hindering oppression." In any case, so vast an institution could not be overturned suddenly without terrible destruction. Gradual, enlightened reform, not dogmatism, had been needed to accommodate the incipient forces of individualism and science. Indeed, a powerful movement for reform had grown up in Germanic Europe in the last decades of the fifteenth century. This was the "rational humanism" of Erasmus and Reuchlin, Pearsonians *avant la lettre,* who worked from within the Church and refused to pander to popular prejudice. They were true enthusiasts of the study. Had they succeeded, a great and worthy institution would have been preserved. Perhaps in time it would have been capacious enough to embrace views ranging from Arnold to Huxley.

Alas, their reasonableness was defeated by fanatical appeals to an ignorant population by "new humanists" who could criticize but could not build, "strolling scholars," satirists, and bohemians. Their allegiance was crucial to the success of Luther, who had first attracted the support of peasants and handicraftsmen by his opposition to the selfish materialism of absolutist monarchs and capitalist traders, but then sacrificed the folk to the advantage of the princes. Unlike Erasmus, who pursued renewal through education, Luther put reason at war with faith. His perilous irrationality was revealed by his obsession with the devil, his imprecations against Jews, and his reduction of marriage to gratification of the male sexual impulse. His social revolution led to terrible hardship and set back European progress by centuries. The moral of this sad episode came straight out of Pearson's "Ethic of Freethought." Social evolution never proceeds by leaps. Laborers of the head understand this. Progress must be achieved through science and education, and never by political demagoguery. Goethe had already recognized Luther's shortcomings.[63]

[62] "K. P." letter to *Pall Mall Gazette,* October 1882, transcript in Hacker Papers, Box 10; Pearson review of Bonet-Maury, *Early Sources, Academy,* 26 (13 Sept. 1884), 162–163; Pearson unsigned review of J. Verres, *Luther, Athenaeum* (6 Dec. 1884), 729–730.

[63] Karl Pearson, "Humanism in Germany," from *Westminster Review,* April 1883, and "Martin Luther," from *Westminster Review,* Jan. 1884; on the absence of leaps, "Socialism: In Theory and Practice," a February1884 lecture, all published or reprinted in Pearson, *Ethic of Freethought*. For the invocation of Goethe, see Louie H. Scaber (one of the students in his Blackheath lectures) to KP, 2 Dec. 1882, Pearson Papers 838/7.

Faith and Ritual: Medieval Passion Plays

But it would be a mistake to understand Pearson's historical studies as strictly subordinated to scientific rationalism. In the early 1880s, he was at least as committed to history as to mathematics, and he was trying to define an aesthetic and a philosophy to make it all whole. If he wanted to account for religion in scientific terms, and to identify religious values that could be sustained at the bar of science, he also was searching for a scientific perspective that could be reconciled with the human need, his own need, for meaning and purpose. He was drawn to medieval culture because he thought the old Germans had achieved a kind of integration of faith, sensuality, community, and knowledge that was lost in the modern world. The study of history was the most essential part of the effort to recover it. And the cultural form that most powerfully expressed this outstanding feature of the integrated life was the passion play. Having failed, as it seemed, to adapt this genre to the demands of a modern sensibility in his own updated version, he undertook to examine its role in the culture of late-medieval Germany. The result was his most remarkable historical essay, one that cannot possibly be read as an expression of scientific monomania.

He published this study in 1897 in a collection of his popular and historical writings. There he explained that he had extracted it from his notes "for a course of lectures on mediaeval German literature delivered in 1883." There is no surviving record that would indicate where or to whom he gave these lectures, if he delivered them at all. But a manuscript on passion plays dated 27 May 1883, a continuous text rather than a series of lectures, survives among the Pearson Papers. What he published in 1897 had been conceptualized and largely written in this quite different epoch of his life. Yet he revised very little, even preserving ruminations on the contemporary relevance of the study that he could not possibly have written or even endorsed in the 1890s.

He was immensely busy at this time with the most exciting mathematical work of his life and so had little time to revisit these historical topics. The decision to print his older work almost unaltered, however, reflects also on the autobiographical sensibility of the author. He was presenting to the world not only his research, but himself, not naked but clothed as an interpreter of history. To credit this work to a person under the same name who wrote it fourteen years earlier was not, for Pearson, to disclaim responsibility (except on the point of up-to-date references). Quite the contrary, it was to assert the continuity of a self across what would seem to be a radical divide, from youthful polymath to mature scientist, romantic Schwärmer to hardheaded statistician. In the same way, a decade earlier he had preserved in his *Ethic of Freethought* almost everything from the original lectures and pamphlets, even the epigraphs from Hegel. In the preface

to his second edition, in 1901, he explained that he had left his texts almost wholly intact so that readers could comprehend the circumstances, "partly historical and partly personal, under which these lectures and essays were written."[64] To print his old essay on passion plays with its original arguments was in no way false or dishonest, for his heart still resonated in quiet moments to the passions and yearnings of this earlier era, even if he had new ways of intellectualizing them. In 1897 he believed that his youthful understanding of passion plays was still full of truth.

His attraction to the genre, in fact, was lifelong. Despite his bemused response to his first passion play in the Black Forest in 1879, he read many manuscripts of old passion plays before publishing his modern one in 1882. On Sunday, 2 September 1883, during that rapturous Tyrolean summer of male comradeship and intimacy with nature discussed above in chapter 3, he attended another. His immediate response, in a letter to Parker, was comparatively subdued. "The Brixlegg Passion Play which we saw on Sunday was rather long, lasting nearly all day, and somewhat wearisome, but quite worth seeing. More of it and much else anon."[65]

Brixlegg lies in the valley of the Inn, northeast of Innsbruck. John Murray's handbook for 1881 mentioned only the "noble and romantic mountain scenery" for this town, but explained elsewhere that "*Bauernkomödien* (peasants' comedies), a species of dramatic performance, rendered famous by the more pretentious *Passionsspiel* of the Ammergau, until the last few years have been witnessed in the villages around Innsbruck and in this part of the Tyrol."[66] Pearson witnessed something less touristic than an Oberammergau production. If the impression it made on him was at first modest, it grew rapidly. In his published study he cited it, mainly in footnotes, for its execution of symbolism and for peasant women who "worked vigorously with soup-ladle and carving knife" serving up lunch at each table during the noon intermission. He explained that for medieval audiences, the great drama was

> the story of the world, . . . rich in interest and significant in meaning for each one of them. They might see one of their fellow-citizens personify God the Fa-

[64] Pearson, *Ethic of Freethought*, 2 ed. (1901), vii.

[65] KP to Parker, 6 Sept. 1883, from Augsburg, Hacker Papers, Box 10. I take this letter to be the best evidence for dating his viewing of this passion play, though the sources are contradictory. In his finished essay he referred to the Brixlegg passion play of 1882: Karl Pearson, "The German Passion-Play: A Study in the Evolution of Western Christianity," in Pearson, *Chances of Death,* 246–432, on 262. It does not appear, however, that he even traveled to the Continent in 1882.

[66] John Murray, pub., *A Handbook for Travelers in South Germany and Austria, 14th ed.* (London: John Murray, 1881), 290, 387. Under "Ober-Ammergau," p. 254, it spoke of the 1880 passion play as "elaborately prepared and creditably executed."

> ther, they might laugh at the repeated discomfiture of the Devil, and smile at the mode in which Judas' soul was carried off to Hell; yet none the less God, Devil, and Hell were intensely real to them, and became rather more so than less when the earnestness of their religion was softened by touches of humour in its state representation. The realism of life itself ever brings the ridiculous into closest contact with the sublime.

A footnote recalled that at Brixlegg, God the Father "came onto the stage with, and claimed an owner for, an umbrella found after the morning performance; nor did the element of the grotesque in this incident at all strike the peasant majority in the audience."[67]

He recalled with particular vividness this last event many years later when he wrote to his daughter Helga in Munich about his experience of this passion play. His guide had told him of the performance while they were descending the Gross Venediger and then joined him in the journey to Brixlegg:

> Next day the Passionsspiel began, I think at 7:30 & we sat till 12, a temporary theatre crammed with peasants. In the morning we had the creation of the world & everything up to the birth of Christ. Then we went out at 12 and had dinner sitting at long tables down the village street. A peasant woman served at the top of each table, ladled out soup & carved the meat. I hardly think there was another outsider—it would be in the '80s—beside myself. At 1 o'clock we returned to the theatre, and the first thing that happened was that God Almighty came on to the stage with an enormous umbrella, which he said some member of the audience had left in the morning. . . . Nobody smiled or saw anything incongruous, and the Deity proceeded to recite his part. We then had the whole New Testament History, flogging, crucifixion and all precisely as you saw it in the woodcutters' work of the 15th & 16th century. Everything even the words were fully 400 years old, and the spirit of the audience was as fully mediaeval. Christ descended to Hell and brought Adam & the Patriarchs out, while the devils resisted & the whole wound up with the day of Judgment about 7:30. It was a wonderful experience, and when I reached Munich next day, I did not want to stay there; it was all too modern and impossible, so I went to Nürnberg. That was my experience of Brixlegg. I had several times been in Munich, first with Oscar Browning in 1875, & enjoyed its galleries & opera etc. But after Brixlegg's acting it was simply impossible. Actors & audience were simply performing a great religious ceremony, absolutely real to all of them, and so I understood how wonderfully the simple folk can portray what they undoubtedly believe. Not even the devils were grotesque, it was simply what they thought life was and ought to be. I think it was Brixlegg which made me write

[67] Pearson, "The German Passion-Play," 262, 278–279.

> my paper on the German Passionplay, at any rate it gave a reality to mediaeval phases of thought which they hardly possessed before.[68]

What most captivated him was the blurring of everyday reality with deep religious truth and of past with present. In Brixlegg, at least on this occasion, the medieval still lived, and Pearson envied those peasants their innocence and simplicity. He associated it with a lack of individuality, or at least with the possibility of socialism, judging from a letter in early 1885 from Annie Eastty, one of the women he was then cultivating, who, with her sister had "spent some ingenuity in trying to discover an occult connection between Socialism and the returning of an umbrella."[69] No doubt he romanticized the event in retrospect, and possibly even at the time. There are discrepancies between his memory and the documentary record, beginning with the Gross Venediger, which he did not climb until the next year, 1884. His draft essay on passion plays was complete several months before he witnessed this one. And, far from fleeing Munich that year, he drank it up. In the same letter to Parker that contained his laconic mention of the passion play, he told of two or three glorious days viewing medieval art there. "Talk of Greece?" he concluded. "It is hard to grasp the perfection of these old Christian socialists! There is something which is so much fuller of practical life and active lesson than the ideal beauty of Hellenism."[70]

With time, however, Germany did in a way become "impossible" for him. The collective performance of Austrian peasants in Brixlegg achieved gradually, in his memory, a perfection that exacerbated his feelings of alienation from urban, industrial Germany. The passion play was his utopia, a harmonious scene located in a past that could still be glimpsed in a few remote places of Catholic Europe but was quite out of reach in England. The Brixlegg peasant mind ascribed the most concrete reality to the divine and the mythical, placing God on the same plane of reality as an umbrella. It would be childish, he explained in his essay, "to introduce mediaevalism into modern life; we cannot bring back the religious guilds or monks or passion plays. . . . There are other calls to action, other opportunities of self-renunciation, other ideals for which to battle." Still, it was important to "prove to the Present that for a thousand years the Past did not toil in vain. . . . There is much, infinitely much directly bearing on our great machine age to be learnt from the old religious socialism."[71]

[68] KP to Helga Sharpe Pearson [later Hacker], 25 Oct. 1925, Pearson Papers 916/2. His wistful sense that passion plays revealed the lost reality of the divine was not unique; see Lears, *No Place of Grace,* 150, 214-215.

[69] Annie L. Eastty to KP, 25 Jan. 1885, Pearson Papers 10/37.

[70] KP to Parker, 6 Sept. 1883, Hacker Papers, Box 10.

[71] Pearson, "A Study in Mediaevalism" (draft manuscript of his essay on passion plays, dated 27 May 1883, Pearson Papers 92), repeated in "The German Passion-Play," 249.

Pearson based his study on twenty-six old religious plays, all of them published in modern German editions. He traced the origin of the passion play to pagan dances for the fertility goddess: "A robust primitive people finds its supreme bliss in rhythmic motion." The Church had co-opted these dances to gain converts, but the transition to modern Christianity was infinitely gradual, and many traces of polytheism, with "all its good and bad qualities," long survived. In particular, the symbolism of childbirth and fertility of the mother-goddess was attached to the virgin, who became "a centre of sex-emotion and a symbol of archaic race feeling."[72] What is called the Christianization of Germany ought to be understood as the assimilation of Catholicism into the beliefs and rituals of the German folk.

The plays had no real characterization, in the modern sense, because the medieval mentality "left no place for individual thought or individual conduct." "It had not dawned on the mind of mediaeval man" that personality and character could be distinguished from action. "His morality was like his religion, one of works and formal observances." The production, too, was collective through and through. It was organized by the guilds, those incomparable medieval institutions, out of a sense of responsibility to provide entertainment and instruction for the community as well as for themselves. The acting was strictly amateur, involving often hundreds of characters—an "authentic folk ritual," with actors indistinguishable from audience. It could be brutally realistic, as with the insertion of the spear into Christ's side, which Pearson recalled from Brixlegg. Some of the "more solemn parts" were governed by "arid routine." Yet the play was something quite wonderful, a collective ritual of social solidarity and religious meaning, combining theater, art, dance, and song in a kind of *Gesamtkunstwerk,* reflecting a communal order and unified world view that makes Wagner's ambitions, by comparison, appear modest.[73]

Pearson admired it particularly as a folk production. Though Christian in content, it retained many elements that the Church could scarcely tolerate, and that Protestantism would not. Due to a strict repression after Luther, "folk-symbolism and folk-art, municipal fête and the old religious socialism would be destroyed"; and "the withering grasp of a dogmatic religion of the schools—without symbolism, without art, without pageantry—would again be laid on the Teutonic folk-spirit." But this already had been tried once, by the first missionaries of Catholicism, who failed. The folk spirit at that time was not to be suppressed; it "danced into the churches; it took Christianity out of the hands of the priests; it moulded it to its own ideas, and shaped it to that wonderful artistic polytheism of which the nominal

[72] Pearson, "The German Passion-Play," 338, 350.

[73] Ibid., 334–335, 364, 369. Pearson and Parker had discussed Wagner's "theories of a combination of arts in the theatre of the future," as a cure for the desiccation and alienation of modern life: Parker to KP, 17 Sept. 1879, Pearson Papers 780.

founder never dreamed." Perhaps that potentiality was not utterly lost, for this same folk-instinct had survived, as he claimed, as an attribute of an allied race, his own. Although the old guild system could not be restored, a greater public role for labor organizations remained desirable and possible. A more unified culture could be achieved through better education and a fairer distribution of wealth. Passion plays, impossible under the repressive order of capitalism, might be revived with a new collectivism. Only then "will anything worthy of the name of a folk-religion be possible, then and not till then can a great religious festival be again a reality."[74]

The Fate of a Renegade Cultural Historian

Pearson was a consummate professional as well as a vigorous enthusiast. Although largely self-trained in history, he did not play the autodidact but mastered the relevant scholarship and worked in primary documents. Had he found employment as a historian, one can imagine a career something like Karl Lamprecht's in Germany, working against the grain of the established school of political historians, seeking a synthetic account of law, society, economy, education, art, ideas, and religion, and looking to integrate this broader evolution of society with contemporary science. Indeed, Lamprecht's teachers, including Maurenbrecher and Cornelius, were among Pearson's favorite historians. It attests to Pearson's familiarity with German cultural history that he unwittingly followed Lamprecht in taking up, as a research topic, Luther and the birth of individuality, and preceded him in his histories of primitive communism and of matrilineal families in early Germany.[75]

As it actually happened, Pearson's historical work on Germany was not much noticed in his own time and is now forgotten. The failure of the emerging historical profession to take him seriously was due in part to his untimely originality, his dissent from the overwhelmingly political—and factual rather than explanatory—orientation of the field. No more in history than in physics or statistics was Pearson willing to regard facts as sufficient to make a science, and so he dissented from the prevailing neo-Rankeanism. His isolation from professional history reflected also his preferred medium of publication, the essay in a highbrow review rather than a survey or monograph, and his field of interest, Germany rather than Britain. Also, his polymathy worked against him. Around 1880, for the first time in Britain, it had become possible, and therefore in a way neces-

[74] Pearson, "The German Passion-Play," 369, 401, 399, 406.

[75] Lamprecht, born in 1856, was almost precisely Pearson's contemporary. On his developing research interests, see Chickering, *Karl Lamprecht,* esp. 54, 123–128.

sary, to make a career as a research historian, and Pearson deviated from the emerging pattern of the profession in too many ways for his work to be incorporated fully into it.[76] It would go against the grain, too, for a man who subsequently became famous as a mathematical statistician and eugenicist to be taken seriously a century later for his historical writing, though Pearson's work is in better accord with modern tastes than that of most of his contemporaries.

After 1884, when he accepted his appointment as professor of applied mathematics at University College and decided not to pursue a post in German history and culture at Cambridge, his historical researches were no longer quite so central to his intellectual life. Not for five or six years more, however, would they become merely avocational, and he never abandoned them. His inability to reconcile a career of unwavering quantification with the appreciation for art, ritual, polytheism, and bacchanalian dance of his essay on passion plays remained for him a source of personal dissatisfaction. It reflected perhaps the impossibility of being a participant rather than a scholarly observer of these surviving folk rituals, of acting without reflecting, and of comprehending God as a part of everyday life, as real as an umbrella. Peasant life, like nature, was tantalizing but alien.

His historical studies, however, were certainly important as a phase in his own development. They framed and sharpened for him the problem of objectivity, which soon took its place at the center of his conception of science and scientific method. His vision of statistics as the indispensable tool of a strong central state reflected his preference for the economics of the old religious socialism over Protestant individualism and capitalistic competition. More even than that, he wanted scientific method to become part of shared wisdom and a shared ethic, so that science could help to rebuild that sense of cultural unity whose loss was the tragic outcome of the Protestant Reformation.

[76] On professional history in Britain, see Collini, *Public Moralists,* 205, 217–218; Ross, *Origins of American Social Science,* 66–69; Goldstein, "Professionalization of History."

CHAPTER SIX

Intellectual Love and the Woman Question

> (K.P. "Dear me! Dear me! This is very, very sad! Emotions, unmixed, unmitigated emotions! I must write to my respected friend O.S. at once. I, K.P., sworn enemy of the emotions, Professor of Applied Mathematics, to have my name appended to so emotional an effusion, no I must write at once. It's not the morals I object to, but it's the emotions!!!")
>
> —Olive Schreiner to Pearson, 9 July 1886, imagining his reaction to the still-unwritten book she proposes to dedicate to him (*From Man to Man*), Pearson papers 840/4.

A GROWING INTEREST in women's issues and curiosity about women's feelings and perceptions led Pearson in 1885 to take the initiative in establishing a "Men and Women's Club," devoted to research and frank discussion on issues concerning women and relations between the sexes. Although he was by this time a professor of applied mathematics, with a heavy load of teaching obligations, he had begun working intensely on historical issues involving the changing status of women, structures of family and child rearing, prostitution, and sexual desire and activity. As late as 1890, on the threshold of his conversion to statistics, he continued to tell correspondents that the history and status of women formed his single most important topic of research. On these matters, as on religion, he was boldly historicist, arguing that the institutions of family and reproduction had varied immensely over written and unwritten history, from a primeval age of "mother-right" whose survivals were still visible at the onset of the Reformation. While he insisted, as ever, that each successive stage in the sexual organization of society had represented progress, he also viewed the matrilineal order sympathetically. He held it up as evidence that the subordination of women was in no way natural, but could and should be ended in a coming socialist era. This work was well known in the women's movements of Britain and America in its time, and the fascinating episode of the Men and Women's Club has been rediscovered in ours. The sexual explicitness, if not exactly radicalism, of Pearson's milieu helped to make it possible for even the English to talk about eugenics, which after all meant public and scientific intrusion into reproductive choices.[1]

[1] Kevles, *In the Name of Eugenics,* chap. 2.

The woman question defined also a compelling set of problems in which, at least for Pearson, scholarly or scientific considerations were interwoven with personal ones. This took various forms, including his tortuously intellectualized proposal of marriage to the secretary of the club, Maria Sharpe, soon after it disbanded. Such questions as the reciprocity of sexual desire between men and women were often on the agenda of this late-Victorian group, and Pearson was the most outspoken of all its members. Since nature was for him also an object of desire, and since questions of intimacy and separation were so central to his philosophy of science, his writings about and relations to women are relevant to any study of his evolving scientific sensibility. In his analysis of sexuality, Pearson was quite explicit about the agony of detachment. The positivism of his *Grammar of Science,* his denial that we can ever acquire knowledge of nature itself, appears from this standpoint as another expression of his ethics of renunciation. At the same time, impersonal knowledge had an undoubted value as a basis for intellectual exchange between men and women that, in the ideal case, would rise above the passions of sex. In practice this proved impossible, as intellectual and personal love became intermingled, and yet it was celebrated by the women of the club even more than by the men. Pearson's ideal of impersonality emerged from these experiences as a blend, combining fear of uncontrollable passion with exaltation of intellectual inquiry.

His involvement with women's issues was pertinent also to his developing views on the ethics of science. He worried, with many socialist men in his time, that the women's movement tended to individualism, while the maternal role offered a contrasting exemplar of unparalleled selflessness. But the subordination of women promoted selfishness of another kind: the egoism of men. This was no abstract concern, but a cause of great personal anxiety, which emerged as a crucial issue in relation to his own marriage. In this sense, his socialism and his advocacy of greater independence for women were allied to his emerging philosophy of science as a means to control an egoism that he hated in contemporary economic institutions, and dreaded in himself.

Sensuality and Prostitution

Pearson grew up in a culture that offered very limited opportunities for friendship or serious conversation between young men and women of the middle classes. While one must allow for the silences of the written record, he appears not to have been acutely conscious of sexual desire until about the time he traveled to Germany in 1879. This not uncommon impulsion was one element in his subsequent cultivation of a more general and even

scholarly interest in the condition of women. From the beginning, it was mixed up with the discomfiting circumstances of his parents' unhappy marriage, which he did not wish to replicate. He was also, as we have seen, personally concerned about the loss of independence for a man implied by marriage, and with it, the creation of a possibly fatal obstacle to close male friendship. Perhaps, however, friendships of the same sort could be formed between men and women, within or outside of marriage, and they might even satisfy the not wholly prurient curiosity that Pearson felt rising within him about the feelings, perceptions, and beliefs of this familiar but elusive form of humanity. Increasingly in the early 1880s he extended his socialist sympathy for the powerless and the downtrodden, especially wage laborers, also to women.

There was also the question of prostitution, which by 1880 was a lively public issue in England. The Contagious Diseases Acts, enacted by Parliament in a series of bills between 1864 and 1869, called for medical inspection of prostitutes in ports and garrison towns to contain the spread of venereal disease among soldiers and sailors. Opposition to these measures, which were applied exclusively to women and involved what was often described as "medical rape" with the instruments of inspection, was an important source of the Victorian women's movement.[2] Pearson would argue that public health concerns clearly outweighed such reservations, and indeed he was among those socialist men who saw the repeal movement as evidence of lingering individualism among women. Evenhandedly, he favored medical inspections for prostitutes and their clients alike.[3] But he was greatly troubled by prostitution, thinking in then-conventional terms of prostitutes as helpless victims of capitalist inequity and the lust of powerful men. In late 1881 he "went street-walking . . . and counted 800 saleable pieces of flesh" between his rooms near Lincoln's Inn and Oxford Circus. "On return I varied the statistical method and tried to come to some conclusion as to age," determining that many were between fourteen and seventeen, mere girls. "I believe the only remedy is to pass through anarchy, i.e. dynamite the present social-arrangements and society generally."[4]

A celebrated exposé in the *Pall Mall Gazette* in July 1885 by W. T. Stead, "The Maiden Tribute of Modern Babylon," stressed the exploitation of young girls by wealthy men, and particularly the gruesome marketing of virgins. Stead even entered the white slave market himself, and reported in vivid detail on his purchase of a young innocent. For this he was prosecuted in a sensational trial and sentenced to three months' imprisonment. The

[2] Walkowitz, *Prostitution and Victorian Society.*
[3] KP to Maria Sharpe, 13 March 1888, Pearson Papers 793.
[4] KP to Conway, 22 Oct. 1881.

brouhaha surrounding these events stimulated interest in the Men and Women's Club, for which Pearson was then recruiting members.[5]

The germ of the club may be found in a thought Pearson communicated to Robert Parker from Germany in 1879, already quoted, where he told of his wish to push aside the "fig leaf" that obstructed honest relations between men and women. Troubled, as it appears, by his own sexual impulses, he looked back to a more innocent time when Greek youths and maidens disported together in truthful nakedness. Prostitution signified for him the worst aspects of the fall from this idealized natural state, the degradation of a vital human bond by the power relations of a capitalistic economy. He viewed this corruption as no mere abstraction, but as a matter of intense personal significance. His youthful admiration for Shelley may already have reflected a dislike of the dependence and coercion implied by bourgeois marriage, and by the early 1880s he favored free marital unions over constrained legal ones.[6] He wrote with acid disdain of middle-class housewives, living off the labor of their husbands. What meets our eyes on "any fashionable London street" in midafternoon is "hundreds of women—mere dolls—gazing intently into shop windows at various bits of colored ribbon." It was reminiscent of scenes of women on other streets at other hours.[7]

From 1885, he argued strenuously that all women should work, and he soon began to preach that they deserved to receive independent compensation for that work, whether they were employed outside the home or occupied with the all-important social function of childbearing and child rearing. This state support would assure the financial independence of women from men, guaranteeing that marriage should always be voluntary and never reduce to prostitution. What, he asked Maria Sharpe in December 1886 (he was already falling in love with her), are the home services that middle-class women provide for men in return for their support? "[I]f they include the services of friendship, possibly those of sex, are you not dangerously near making the fairest human relation a matter of pecuniary arrangement? I want both man & woman to be absolutely independent in matters of economy, so that sex-selection shall be based solely & purely

[5] Walkowitz, *City of Dreadful Delight,* chap. 3; Schults, *Crusader in Babylon*. On prostitution as coercive, see DuBois and Gordon, "Seeking Ecstasy on the Battlefield."

[6] On Shelley and British sexual radicalism, see Taylor, *Eve and the New Jerusalem,* 44. W. M. Rossetti's entry on Shelley in the *Encyclopaedia Britannica,* 9th ed., vol. 21 (1886), 789–794, emphasized his belief in marriage as a "voluntary relation between a man and a woman" (790).

[7] "K. P.," *The Woman's Question. Being a Paper Read at the Preliminary Meeting of the Wollstonecraft (?) Club, July 11th 1885* (London: Privately printed by W. King and Sell, 1885), Pearson Papers 10/2, 17; on women and shopping in 1880s London, cf. Walkowitz, *City of Dreadful Delight,* chap. 1.

upon common sympathy and the tie of friendship."[8] His scheme of state-endowed motherhood, discussed below, was among other things an answer to the moral dilemma occasioned by the financial dependence of middle-class wives on their husbands.

By 1890, Pearson was much more likely to discuss marital and sexual relations in the cold-blooded terms of efficiency and racial progress, but he could never suppress his anxiety that legal coercion and economic dependence might cause love to be feigned—appearance without substance. Already in 1885, his new idealization of strong, independent women had led him to a less appreciative view of Goethe, who portrayed the ideal woman as wholly unintellectual, after the fashion of Gretchen, "the perfection of dolldom." In 1914, in a mood of profound opposition to war and of renewed skepticism about contemporary German culture, he noticed a lack of complex and subtle emotions even in this classical period of German literature. How, he wondered, could "the seething intellect of a Faust" be "attracted by the simple-mindedness of Gretchen? . . . Goethe could not have understood the type of woman who should stand as peer and comrade of modern man."[9] Of the modern German poets, only one could with profit be read and reread, and he was not German, but Austrian.

That poet was of course Robert Hamerling, whose prose epic *Aspasia* Pearson first read in the summer of 1881, and who provided a literary redemption of the feminine. *Aspasia* was inspired by the life of the famous concubine of Pericles, depicted as an irresistibly sensuous Milesian among the severely virtuous Athenian men and their dour wives. She was too independent for the customary life of sexual slavery, having been given in marriage to a Persian king, whom she defiantly fled. But she was in no way reluctant to deploy her charms to sweeten the life of men and women alike. Socrates, calling her a practitioner of "the most philanthropic of professions," admonished that beauty is transitory. His was a misapprehension, however, for while Aspasia rejected slavery in love, she also refused to enter the "career" of "nymph." Pearson was not quite comfortable with such overpowering sensuality in Hamerling's fiction. There is a warning in his hand to unspecified others—presumably the women of the Men and Women's Club among whom his copy circulated—to pass by the chapter concerning the pleasure garden wherein Aspasia and Pericles drink of the

[8] KP to MS, 14 Dec. 1886, written just one day after he first proposed the socialization of motherhood in an essay on "Socialism and Sex" read to the Men and Women's Club, later published in *To-Day* (Feb. 1887) and reprinted in *Ethic of Freethought*.

[9] Pearson, "Woman's Question," 13; KP to Maria Sharpe, 6 July 1885 (where he admitted the attraction of these doll figures to men, even to himself); Pearson, "Wie steht's mit der deutschen Cultur," 34.

delights of love, if these readers "would not penetrate to the baser nature of this poet Hamerling."[10]

But Aspasia is far from base. Her love for Pericles is soon consecrated in a free marital union. Her sensuality becomes the inspiration for public beauty, as with her wiles she induces the Athenian leaders to raise artistic over martial values by constructing the Parthenon. That is, she brings pleasure to men even as she elevates them to a higher moral plain. This, the distinctive contribution of the feminine, depends on her assertion of an ideal of greater independence for women. In his 1882 lecture on Hamerling, Pearson worried that the "Gospel of Beauty" might be degraded to a "Gospel of Sense." But he condemned philosophical antisensualism, dismissing "Puritan morality" as tantamount to immorality. The great problem of the day, intimately linked to the circumstances of women, was to find a "union of soul & sense," a "Christian Hellenism." Women had their own special duty in this passage to a higher stage of culture, one that required activity rather than passivity. "What man *may* read, woman *must* read."[11]

His worries about women were always turned partly inward. The late marriages required by modern civilization, he told Parker on Christmas Day 1880, "are either bad for a man's physical health or else his morality, where by morality I do not mean the ordinary cant, but the acting towards every woman as if she had at least some fraction of the abstract ideal we have formed of the class, resident somewhere in her." His painful ambivalence about sex surfaced in his speculation that it might even give evidence against evolution by revealing "the creative will of a God (? Devil) who saw in family and relationship a means of binding mankind together (? or of reducing them to the level of brutes)."[12] These anxieties, and his appreciation of Hamerling's female characters, are evident also in his 1882 passion play. The Jesus of the play, tempted by the demon of lust, developed an intense suspicion of the sensual and declared his mother's affection to be the only authentic love. Mary Magdalene, who, as Pearson imagined her, had formerly been impressed into concubinage in an antique Babylon, was in many ways his opposite. Although she eventually took flight from the evil prince in Magdala who held her captive, she thereafter became a slave of the sensual, "drowning all care in joyousness." Each recognized in the other something needful. Jesus introduced the dis-

[10] Robert Hamerling, *Aspasia: A Romance of Art and Love in Ancient Hellas,* trans. Mary J. Safford (New York: William S. Gottsberger, 1885). Pearson's markings on his German copy are recorded in Hacker Papers, Box 8.

[11] The notes for his lecture on Hamerling, 30 April 1882, are in Pearson Papers 47/2.

[12] KP to Parker, 25 Dec. 1880.

appointed and cynical Mary to the possibility of a higher love, involving service to great causes. At the same time, she convinced him that physical love, when free of constraint, could be virtuous, and that stony denial of sensual need may cause the soul to be consumed by ungratified desire. Pearson's Passion Play thus followed its religious prototype in bringing a message of redemption. The prostitute can rediscover the commitment of a deep human bond, and the man of heavy conscience can love purely without forsaking the body.[13]

Friends Not Lovers

Pearson talked and corresponded rather intimately with a sequence of women in the 1880s, including Elisabeth Cobb, Olive Schreiner, and finally Maria Sharpe, whom he married in 1890. Pearson met Cobb, Sharpe's older sister, on 8 November 1881, an "anniversary" that she often recalled to him in subsequent years. She wrote him over three hundred letters in the next half century, many of them from 1882 to 1885. Schreiner supplanted her as Pearson's favored female correspondent in 1886, and for a time before her breakdown in mid-December of that year, she was writing him several times per week. By then his correspondence with Sharpe was becoming more intense. For several years, however, it remained careful and polite, all the more so because they wrote in their capacities as organizer and secretary of the Men and Women's Club, often about such club discussion topics as marriage, desire, prostitution, and sexual health.

Schreiner destroyed Pearson's letters, and Cobb's from Pearson have also disappeared.[14] Pearson, by contrast, kept almost everything, and the history of the Men and Women's Club has been reconstructed primarily from his and Maria Pearson's collections. Cobb and Schreiner were both, as we might say, feminists, of a generation that emphasized the differences between men and women. They often reflected on his words, sometimes even quoting them back to him, but their interpretations of the man are certainly not to be taken at face value. They liked to depict him, as in Olive Schreiner's joke quoted above in the chapter epigraph, as cold and emotionless, a reasoning machine of the quintessentially masculine type. They

[13] Pearson, *Passion Play,* 22, 24, 65–66, 96.

[14] In 1885 he asked her to burn his letters, rather a rare thing for him, giving some indication of how much he had confessed to her. "You must not ask me to do that," she responded, calling them "landmarks" for her and links to her past. The letters have been lost, however. Elisabeth Cobb to KP, 3 June 1885.

were not altogether wrong. Pearson felt himself so severely buffeted by his emotions that in the years of the Men and Women's Club he strove self-consciously to subdue them with icy reason. He also was troubled that the ideal of dispassionate intellectual relationships between men and women proved so difficult to sustain, not least because of a certain irrepressible tendency of its members to fall in love with one another.

Cobb was Pearson's senior by well over a decade, married to a radical member of Parliament of resolutely practical bent. She yearned to move in a world of ideas, one that was not readily accessible to a mother of four and stepmother of four more, out beyond London's northwestern suburbs near Harrow. "I have told you before how you have been to me a window opening on to wider, loftier views. I need not tell you again," she wrote him on their third anniversary.[15] No doubt she would have liked to receive more signs of personal warmth from Pearson, but she valued him as a fount of ideas and critiques and as a bridge to the intellectual life of the metropolis. She was also interested in Germany, and even read the language, so he very early lent her his copy of Hamerling's *König von Sion*. For his part, he was able to confide to women, and first of all to her, certain thoughts and feelings about which he was more reserved with his family and with male friends such as Parker. Within weeks of their first meeting, he trusted her enough to send a copy of *The New Werther* as evidence of his irresolution and despair. She thought it "morbid and unhealthy," though not unnatural as a phase in the development of "young minds," and offered the Carlylean remedy of "work for others." She was unsure whether to read the book as fiction and tried to reassure him on the basis of one of his early reviews on socialism that any person who was able to write with such commitment could not be "like the little book, as you wanted to make out to me you were." Three years later, she responded to news of Raphael Wertheimer's prospective arrival in Saig as if Lotte had come to Weimar. "I thought all the characters in that book were fictitious, except the hero in a shadowy way. Were they not? & did he come?"[16]

Cobb was also uncertain—as Schreiner would be later—about the nature of the emotional bond between herself and Pearson. At one particularly traumatic juncture in December 1886, she called him "more impersonal than any one I know, he looks at things from an outside standpoint, and in the abstract, and seems as a rule absolutely without personal feeling."[17] When she wrote him that feeling and sensitivity defined what was distinctively human, he countered by affirming the preeminence of reason. What she offered to him in long, free-flowing letters as expressions

[15] Cobb to KP, 7 Nov. 1884.
[16] Cobb to KP, 27 Nov. 1881, 18 Dec. 1881, 28 Dec. 1881, (undated) Sept. 1884.
[17] Cobb to Brian Donkin, 14 Dec. 1886, Pearson Papers 840/6.

of her personal views and commitments, he took the liberty of criticizing for illogic. Yet she appreciated the opening he provided to a world of reasoned argument and understood well enough his need for reassurance and support.

She wanted to be the one to provide it. "Don't you think it is a splendid thing for a man to dig in his garden, among other things; it always seems to me direct contact with old Mother Earth is so intensely wholesome. I know when I talk of nature you always tell me *mind* is what we need, but it always seems to me our minds get crumpled & warped & crooked without the personal contact from time to time." The "personal contact" in this suggestive passage referred also to her wish, frequently reiterated in less allusive language, that he would visit her more often, rather than merely writing. When he sent her a joke about advertising for a wife, with all the qualifications specified, she responded with a cautious defense of passion, which she hoped might sometimes be the outcome rather than the cause of sympathy and friendship. For him, however, she envisioned a more detached existence. "I have sometimes thought, I might even have said hoped, you might be one of those people . . . who did not need the married life, but could live with the larger love, the wider emotion."[18]

If she generally deferred to him on matters of science and reason, he was the more vulnerable emotionally, and her role as counselor and confidante undergirded her evident hope that she might be without rival for his asexual affections. Although she reported feeling especially nice after his visits, he never found their relationship quite satisfying. They agreed on the virtues of *Entsagung,* renunciation, not just abstractly but as a vital element in their own lives. He complained, however, that visiting her occasioned a painful excess of introspection. She was delighted, she wrote on another occasion, to learn that he had been laughing for a change. "But why do you make of me a species of avenging deity, saying the thought of me upbraided you for frivolity!" In December 1885, he explained to her in a detached voice that was yet unmistakably personal, of "the fact & a very terrible fact it sometimes is, that a man or woman's life may be crippled, rendered almost unendurable by not exercising the function." It depends, she replied, on "how much the mind is allowed to dwell on this special function."[19]

Pearson's dwelled on it quite a lot in the years of the Men and Women's Club. The club, as established in 1885, was largely his idea, a product of his curiosity about the other sex and his growing interest in the condition

[18] Cobb to KP, 19 May 1884, 21 Oct. 1884.

[19] Cobb to KP, (undated) Sept. 1884, 27 March 1886, 4 Feb. 1886; this last letter quotes back to him the line he wrote in December, by which time he was already smitten by Cobb's sister, Maria.

Figure 6. Elisabeth Cobb. She wished for Pearson the larger love, the wider emotion. (Courtesy of UCL)

of women, past and future. Its history has been told in several recent publications.[20] Cobb was his most important ally in recruiting members, who were to consist of men and women in equal numbers. Such clubs, often linked to political or social causes, proliferated in London at this time. Pearson had links with several, including Fabians, anarchists, theosophists, Goethe admirers, and would-be reformers of Russia. If this one was to succeed, it had to cultivate trust that participants could discuss the most delicate subjects in confidence. It was thus limited to a select group, about twenty, who met in each other's houses, most often that of Robert Parker. The delicate question of sexual desire rose to the surface almost at the outset, the partly inadvertent consequence of Pearson's inaugural paper for the club in June 1885.

Kegan Paul had insisted to Pearson in reaction to his passion play that his Mary Magdalene was impossible because real sexual desire was distinctively male. "Desire of the man for the woman, but desire of the woman for the desire of the man," he intoned, invoking Coleridge.[21] Pearson, who wavered on this vital question, took the view in his essay that women were not sexual beings but reproductive beings, possessed by an overpowering biological drive. He cited an unnamed female author on "the stifled cry of unmarried women: *Give us children or we die*." The fulfillment of this, Rachel's plea, depended not on God but lustful man. Pearson's biological restatement of Coleridge's line ran: "Race-evolution has implanted in woman a desire for children, as it has implanted in man a desire for woman."[22] He wondered if the health of single (childless) women was harmed by their defiance of nature, just as that of men could be damaged—a commonplace of contemporary medicine—by suppression of the sexual instinct. At the same time, he believed that barriers between men and women and enforced silence about sex had given it an undue prominence. He hoped that coeducation of boys and girls would lead men to understand that "sexual attraction" (he revised this in the published essay to "sex-friendship") had "other and more worthy elements than mere sexual passion." "A full knowledge of the laws of sex would do something, I think, to reduce the sexual relation to its true subordinate position, and

[20] Most notably, Walkowitz, *City of Dreadful Delight,* chap. 5; also Bland, *Banishing the Beast,* esp. chap. 1; Brandon, *New Women and Old Men,* esp. chap. 2. Walkowitz's chapter is based on a paper first published in 1986, Bland's on one that appeared in 1990.

[21] From Coleridge's *Table Talk,* 23 July 1827: "The man's desire is for the woman, but the woman's desire is rarely other than for the desire of the man." KP to Parker, 24 Oct. 1881.

[22] Pearson, "Woman's Question" (1885), 5. In the published essay in *The Ethic of Freethought,* 374, he was more tentative, beginning the statement about women and children with an "If" and omitting the clause about men's desire.

might enable men and women to understand each other's nature better, and so meet on equal terms." His assertion of the similarities between sex and mountain climbing ("physical pleasure taken in the society of a friend"), which the women including Sharpe thought trivializing, was part of his effort to convince them and himself that "*the mere act* in itself" was inconsequential by comparison to "the sympathy & friendship between correlative human beings which may precede it." The pleasure of coition is like that of eating a strawberry, though likely to be enhanced by the associated pleasure of being with a friend.[23]

"The Other Side of the Question" was the woman's side, and in October Henrietta Müller read a paper under this title to the Men and Women's Club. A journalist educated at Girton College, Cambridge, she of all the members had the least use for men. She affirmed Pearson's point about woman's relative lack of sexual drive, from which she reasoned to an affirmation of woman's inherited moral superiority over the predatory male. But others were not so sure, and even Müller's supporters emphasized women's self-control as well as their more moderate sexual passion. Olive Schreiner and Horatio Brian Donkin—known to history as Karl Marx's physician—dissented from all such arguments about deficient female sexuality, and, notwithstanding some much-cited exceptions, theirs was the usual view in Victorian medical writings. Schreiner was always well supplied with curious examples based on conversations with prostitutes and woman friends, and sometimes even on her own experience. This was the kind of personal evidence that the men of the club could not well dispute.[24]

A particularly detailed refutation of Pearson's essay was communicated to him privately by Emma Brooke, also one of the first woman students at Cambridge and an early Fabian, who earned her living writing triple-decker novels. She had attended one of his extension courses, and she started their correspondence by writing to enlist his support on behalf of some striking miners. The files contain thirty-six letters from Brooke to Pearson, including an account of her mistreatment as a girl by the author James Hinton, whose faith in an all-encompassing sexuality was admired by some members. Hinton's advocacy of free sexual unions was itself, in effect, on trial in late 1886 when his son Charles Howard Hinton was placed in the dock for bigamy. Pearson, after reacting initially with cautious favor for this man who would draw back the veil around human sexuality, came quickly to loathe the Hinton doctrines, based in part on Brooke's disturbing personal experiences of the self-styled philanthropist as sexual predator, which she described to him in December 1885. Al-

[23] Pearson, "Woman's Question" (1885), 9; cf. *Ethic of Freethought,* 378–379; KP to MS, 14 June 1887.

[24] Oppenheim, *"Shattered Nerves,"* 202.

though she was never asked to join the club, Pearson sent her a copy of his "woman's paper" in February 1886, and when she replied that its considerable merits were compromised by its "lack of real insight" about women, he invited her to rebut it.[25]

Brooke's "Notes on a Man's View of the Woman's Question," ran to thirty-nine handwritten pages. Although Schreiner saw Brooke's comments, they were never circulated to the club. Brooke instructed Pearson not to associate her name with these opinions, and later asked him more than once to destroy this text and related letters. Her reasons for seeking to guard her anonymity can be imagined. It is, she wrote, a "cherished illusion . . . in man to suppose that a pure Woman floats half-asleep on a smooth pool of Chastity all her life—unless he awaken her passion." In fact, the desire of men and of women is "for all practical purposes precisely on a par." "Possibly a woman's passion is never so explicit, so nakedly physical as a man's; it is more delicate, but therefore more tenacious, more piercing & painful. It should be remembered that her whole being is more attuned to the emotions, is predisposed to affection,—that tenderness & love in women are imperial impulses driving her irresistibly, often manifestly *against* her own interest, towards the man."

Brooke rebuked Pearson for his opposition to "preventive checks," calling these "*the only moral basis of marriage*" because they could free woman from having to bear children against her will. His stance, she perceived, was rooted in a conviction that nonreproductive sexual relations must be purely exploitative, since they isolated sex from what women most urgently wanted and needed, namely children. Brooke called this the "Madonna image," the ascription to women of an occult desire for children driving them independently of their conscious will, and she thought it absurd. "The barbaric tendency to credit the unknown with occult qualities is not lost—even in this paper." Pearson's bold talk of the maternal tendencies instilled by "race-evolution," recorded as if a conclusive statement of "proven scientific fact," was, she thought, commonplace dogma, "the writer's leap into conventionality."[26]

The question of woman's sexual desire was debated at the club in the fall of 1885. It was a kind of trial by fire for these Victorians, not only on account of the inevitable awkwardness of such discussions, but also the

[25] Emma Brooke to KP, 5 July 1885, 4 Dec. 1885, 24 Feb. 1886. In Pearson, "Woman's Question" (1885), 11, he referred respectfully to Hinton's "earnestness," but in the 1888 version in *Ethic of Freethought,* 383, Hinton was merely "illogical."

[26] Emma Brooke, "Notes on a Man's View of the Woman's Question," Pearson Papers 10/2. The Victorian theory of the "passionless woman" has been emphasized in much scholarship on women, as in Kent, *Sex and Suffrage in Britain,* 50, who argues for a sea change in the 1880s. Oppenheim, *"Shattered Nerves",* 202, shows that female sexual desire was widely recognized and even approved in Victorian medical writings.

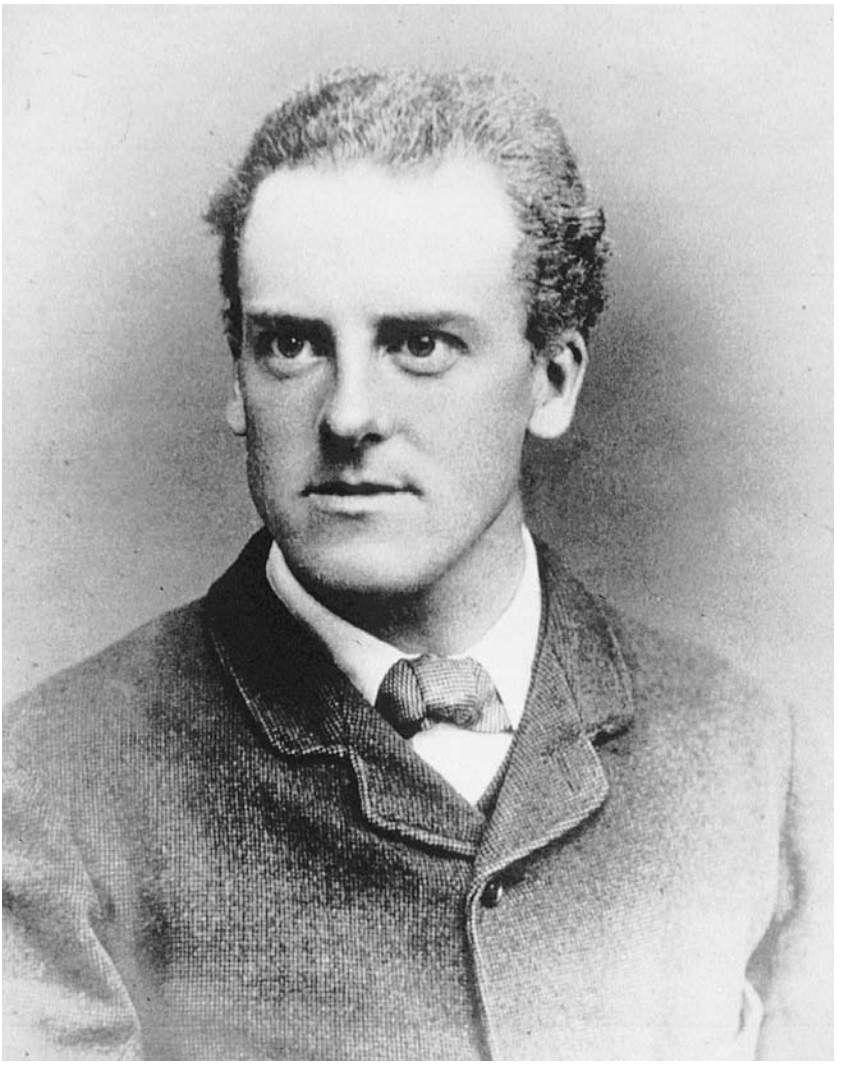

Figure 7. Karl Pearson. *Das Innere*, he told Sharpe, is an unreasonable bag of emotions. (Courtesy of UCL)

asymmetry of participation, with men positioned as inquirers and women often as objects of investigation. Pearson, for whom no subject was outside the bounds of legitimate rational inquiry, wrote for the club a "note on the sexual feeling," which manifestly gave expression to his own passions and uncertainties, although the authorial voice was strictly impersonal. He offered case histories of various sexual types, male as well as

female, all premised on a conservation principle that sexual energy, while convertible into intellectual or physical energy, must find its outlet somewhere. By this time he had been persuaded to give up the radical distinction between male and female desire. Prostitution was now reduced to intercourse where desire by the woman was absent, while reciprocal desire constituted "the only rational ground for the act . . . , the scientific and only safe basis for the act." Schreiner dissuaded him from presenting his note to the club because of his doubts about the possibility of true friendship between men and women, uncorrupted by sexual attraction. Maria Sharpe, who had hitherto moved mainly in the company of her sisters and other female friends, viewed the paper more favorably, applauding it for recognizing the need of women for contact with men's minds. She found other aspects of maleness less appealing, for most women enter marriage with no desire for children and with repulsion for the "sexual function." Pearson, by contrast, now supposed that while men might be more powerfully driven than women by an indiscriminately physiological "sexual impulse," natural selection had made them equal in the more directed and personal "sexual attraction."[27]

Two years later he resurrected some of these arguments as a response to another paper and presented them to the club. He still feared that sexual desire might overshadow friendship, although he also argued that the different perspectives of men and women made possible still "finer intellectual sympathies" in friendships of man to woman than of man to man or woman to woman. Sex, he supposed, was not among these finer sympathies, but neither need it destroy them, and it might even enhance them. He reaffirmed the analogy between sexual intercourse and mountain climbing, defending sex in moderation as one dimension of the proper exercise of all human faculties, and denouncing "cramped" asceticism, especially as imposed on women. Preventive checks could place men and women on an equal footing with regard to sex, far preferable to "the old male tyranny which attempted to dictate the mode & the amount of sexual exercise which was fitting for a woman."[28]

If Pearson was no longer ashamed of sexuality as such, he certainly worried about the reduction of women to sex objects. In March 1886, he had explained to Brooke that the struggle for existence could only strengthen male sexual desire in subsequent generations and must similarly tend to weed out the lines of women who are disinclined to bear children. He

[27] Karl Pearson, "Note on the Sexual Feeling" (1885), Pearson Papers 10/3; KP to Parker, 13 Sept. 1885; MS to KP, 15 Nov. 1885; Walkowitz, *City of Dreadful Delight,* 152–153. As an old man, he recalled these debates and wondered if he hadn't been right to begin with after his new wife Margaret burst into tears because it seemed she could not have a child of her own; KP to Sigrid Pearson, 11 Sept. 1930, Pearson Papers 926.

[28] Pearson, "Thoughts Suggested by the Papers & Discussion of the Meeting of the Club on May 9th [1887]," Pearson Papers 10/11.

seems to have written regretfully of this inveterate male tendency, because Brooke responded with a defense of the sex impulse in men as often attended by a "warm physical nature. . . . I do not like you the better for speaking as if you found it hateful in yourself or others."[29] The line of communication leading to this exchange can be surmised. He had suggested in his original printed pamphlet that if prostitution were really a cultural universal, then prostitutes should not be despised but commended for their sacrifice of self, in pursuit of a "nobler calling than that of wife." Brooke's riposte condemned the view that women deserve plaudits in proportion to their sacrifices in the service of man. This reply was on the mark, and yet Pearson's ostensible praise of prostitution had been purely counterfactual. In the current condition of society, "friendship between single men and women" may be "almost impossible," but he conceived the club as an experimental effort to see whether it might be achieved after all. Most men, he told Sharpe, are innocent of the "refined brutality" portrayed by Stead in the *Pall Mall*.[30] If curiosity about what women hid from men had in part impelled him to organize the club, his more exalted mission was to raise the moral character of his sex—not neglecting that particular instantiation of it, himself.

The ideal of friendship "from man to man" expressed one of Pearson's visions. This separation of friendship between the sexes from sexual love was a utopian project, deriving from the radicalism of the 1790s, and taken up later by Benthamite utilitarians and chartists. There was a possible model in John Stuart Mill's early attachment to Harriet Taylor, an unconsummated relationship that some, including Carlyle, thought unnatural, and blamed for Mill's poor health.[31] Perhaps Pearson was already conscious of the fragility of this ideal of friendship when he proposed it as a condition of his relations with Olive Schreiner. She, however, welcomed it most heartily, as did several women in Pearson's circle of acquaintances during those years. The independence of friendship from sexual attraction meant easier access for women to the world of formal intellectual inquiry, and Schreiner, like Cobb, was effusively grateful for the opening he provided her. Pearson's passionate intellectualism, so capacious as to embrace questions of faith, love, and sex, was surely an element in his attractiveness to these women, even if they sometimes turned it against him by calling him cold and impersonal. Indeed, impersonality became a fundamental aspect of his persona, but this was in part a consequence of the contradictory emotions and tangled relationships that grew up within the club.

[29] Emma Brooke to KP, 14 March 1886, Pearson Papers 10/28.

[30] Pearson, "The Woman's Question" (1885), 11, 8; Brooke, "Notes on a Man's View" (note 26); KP to Maria Sharpe, 6 July 1885.

[31] Mason, *Making of Victorian Sexual Attitudes,* 3, 63; Luftig, *Seeing Together,* 26.

Love's Contradictions? Pearson and Olive Schreiner

The principal nodes of these entanglements were Pearson and Schreiner. She had come to England from South Africa in 1881, and in 1883 she published with Chapman and Hall her *Story of an African Farm,* which gained her a certain celebrity. She quickly found her way into the London network of radical intellectuals in which Pearson also moved. She was particularly close, in the years 1884–1885 and subsequently, to Havelock Ellis, then a Hintonian sexual radical, later to achieve fame as a pioneering sexologist. She loved him for his gentleness and evidently shared with him a sexual relationship that, as was usual for him, did not extend to coition. Previously, she had had two disturbing sexual affairs and suffered what Ellis plausibly diagnosed as an element of masochism ("I would like *him* to tread on me and stamp me into fine powder," she wrote of one of these lovers). At the same time she was ashamed of her desires, which made her feel like a prostitute, and she was trying in these years to "crush and kill [the sexual] side of my nature." The bromides she took to diminish her sexual urges may have contributed to her mental instability.[32]

Pearson thought highly of *African Farm,* and Schreiner became an admirer of his writings before she knew him personally. They met after Cobb suggested her for the Men and Women's Club, remarking bemusedly that Schreiner perhaps didn't even believe in marriage. Several women in the club were nervous about sexual irregularities, and they had vetoed Pearson's proposal to call it the Wollstonecraft Club on account of Mary Wollstonecraft's unsanctioned relationship with William Godwin. They also opposed on similar grounds the plan, backed by Pearson, to recruit Schreiner's friend (and Karl Marx's daughter) Eleanor Marx (Aveling) to the club. Maria Sharpe objected to her for putting into practice "her theory" of free love, even though Eleanor called her union with the (separated but undivorced) Edward Aveling a marriage in all but name.[33] Schreiner subscribed neither to the theory nor the practice of free love, but she met men alone in their rooms, consorted with prostitutes and reported on their conversations, talked freely about sexual matters, and was conspicuously unconventional in her speech and behavior. She seems to

[32] First and Scott, *Olive Schreiner,* 312, 141; Grosskurth, *Havelock Ellis,* 80–87. Oppenheim, *"Shattered Nerves,"* 220, doubts that drugs were responsible for Schreiner's depression and breakdown.

[33] See undated note by Sharpe filed with letters of Annie L. Eastty to KP, Pearson Papers 10/37; also Walkowitz, *City of Dreadful Delight,* 140, and Brandon, *New Women and Old Men,* 49. Marx knew of this reaction when she declined an invitation to join the club, and Sharpe was offended at the implication that her objections owed to "unreasoning and senseless propriety." Pearson wanted to offer membership to "Mrs. Aveling," but not to her mate (KP to MS, 10 Feb. 1886). On Marx and Aveling, see Tsuzuki, *Life of Eleanor Marx.*

have preferred the company of men to that of women,[34] and she did not defer to the opinions of male members, who seemingly tolerated or even welcomed her outspokenness. She was drawn particularly to Pearson, and in July 1885 she began an increasingly intense correspondence with him about club discussions and other matters. Her letters imply that he had laid down as a condition of their friendship that it be as "from man to man." She welcomed this stipulation as the removal of an obstacle to intellectual closeness. "(K.P. 'Idiots these women are')," she imagined him responding to one of her letters, and answered him: "but I'm not a woman, I'm a man, and you are to regard me as such."[35] They corresponded as Karl and Olive, a notable liberty in London in 1885.

Olive insisted throughout that she valued him above all for intellectual stimulation and companionship, and her letters lend ample support to her claim. One of them began: "Your paper is deliciously, tantalizing, excitingly suggestive."[36] It is necessary to reconcile this truth with another, equally compelling: she fell in love with him. After he declined what he later described as an urgent sexual appeal in December 1886, she tried to explain that since he had enjoyed many intellectual friendships, he might not appreciate how much such a friendship could mean to a woman like her. "Our brief intellectual relations and our few conversations have been common-place enough to you, to me they have been absolutely unique. I have known nothing like it in my life." They corresponded particularly about issues involving women and sexuality. She looked to him to write a definitive treatise on the sex question and, like Cobb, was somewhat jealous of his mathematical activities. In August 1886, when he called Newton's mind superior to that of Goethe and of Shakespeare, she objected that Newton was narrow, while the literary men were, like Karl himself, wide-ranging and balanced.[37]

Still, she thought him badly misinformed on many issues involving sex and women and took it as her charge to set him straight. "It is monstrous of the Hintonians to say that a woman's desire for children corresponds to a man's desire for sexual love," she wrote in May 1886, possibly forgetting that he had reiterated this argument. Later, she ridiculed his idea that primitive couples practiced sexual abstinence for years after every birth. Medical men may now recognize sexual intercourse with a nursing mother as harmful to the child, she conceded, "but it is hardly likely that the

[34] Showalter, *A Literature of Their Own*, 195.

[35] KP to MS, 8 Sept. 1889; Schreiner to KP, 29 June 1886, Pearson Papers 840/4. Schreiner wrote in a very difficult hand, and I have relied on transcriptions in the Hacker Papers. On their friendship, see Fradkin, "Olive Schreiner and Karl Pearson."

[36] Schreiner to KP, 13 July 1886, Pearson Papers 840/4.

[37] Olive Schreiner to KP, 30 Jan. 1887 and 7 August 1886, printed in Rive, ed., *Olive Schreiner Letters,* 101, 121.

Figure 8. Olive Schreiner in 1884. Pearson died to her personally, she said later, but lived and worked on impersonally. (From S. C. Cronwright-Schreiner, *The Life of Olive Schreiner,* 1924)

savage man cared anything about that; and you speak as though a suckling woman could not be an object of desire to man!"[38] She also defended the aesthetic and indeed intellectual worth of sexual relations. "I don't quite understand the view you meant to express with regard to man's sexual degeneration," she wrote. The senses are central to our being, and sexual feeling is "a mingling of *all* the other senses." Yet she would leave it to others to enjoy "sexual pleasures . . . in their simply sensuous form; for me it would be death. What is all the joy that the touch of a man's hand would give, compared to the touch of brain on brain?"[39]

Olive was acutely conscious of her emotionality, for which Karl must have reproved her, and she tried to rein it in. Karl, seemingly unable to learn the lesson that his Magdalene has taught Jesus, was ashamed of his sexual urges. He confided in Olive on such matters, telling her in 1886, for example, that he "had never had any sex relationship even of the Hintonian type in his life, never kissed a woman passionately." He must have explained also what he expressed more impersonally to the club, how much this made him suffer. She declared to Ellis that she was no longer a sexual being, that she loved Karl all the more because he was physically weak and felt closest to him when she was far away, exchanging letters rather than glances and spoken words. But this intellectual love, she insisted, was a much deeper and more powerful love than the physical. It was a form of love that Pearson also shared with Elisabeth Cobb. Cobb had not been disloyal sexually to her husband, Schreiner declared angrily in response to Ellis's suspicions, but her intellectual love was "a much more deadly one from a husband's point of view than any sex-feeling!"

This must have brought little consolation to Ellis, who by 1886 was bitterly jealous of Pearson on account of Olive. She openly complained that Ellis always asked her about her feelings, as if the life of her mind should reduce to an account of her "internal state," whereas Karl demanded the cultivation of her intellectual faculties.[40] She considered Pearson a thinker of the first rank, a "great man of genius," but one who suffered and so needed her support. She recited to Ellis a characterization by Lucy Clifford, widow of the mathematician William Kingdon Clifford and another of Pearson's close correspondents: "I can't understand any woman's seeing him without loving him & wanting to fall down at his feet & I can't

[38] Schreiner to KP, 12 May 1886 and 6 June 1886. He must not have been convinced. In "A Sketch of the Sex-Relations in Primitive and Mediaeval Germany," *Ethic of Freethought,* 400, he declared that during the whole period of nursing, for three years in mother-age society, "the woman must, by a well-known physiological law, abstain from intercourse with the man."

[39] Schreiner to KP, 2 July 1886 and 3 July 1886.

[40] Grosskurth, *Havelock Ellis,* 101; Schreiner to Havelock Ellis in Draznin, ed., *My Other Self,* letter 364 (25 June 1885).

understand any woman's thinking he's a man." The love he inspired in women was like that of Dante for Beatrice.[41]

Schreiner was not lying, but it is very difficult to believe that she knew her own mind, and none of the scholars who have written on this episode have thought so. Several have implied that Pearson forced on her this alienating conception that would disbar a union of intellectual and sensual love. To me, the ideal of purely intellectual friendship appears to have been Schreiner's ideal as much as Pearson's, and she was often more eloquent and forceful in articulating it. Although she made fun of his obsession with impersonality, this was in many ways a shared strategy for intellectual love across the dangerous divide of sex.[42] Yet it is correct to see him as the more militant rationalist, and in many ways the more anxious about maintaining a divide between intellectual friendship and sexual attraction.

Pearson evidently became aware quite early of an asymmetry in their relationship. However impressed he may have been by her intelligence and vitality, he was not in love with her, and he feared increasingly that this lack of feeling might not be reciprocated. He thus invoked the demands of reason to keep their relationship in check. Quite possibly he was thinking of her when he wrote, some months before their friendship came to a crisis, that (as she recalled his words to him) "the greatest tragedy in life was to *be* loved by a perfectly beautiful, tender, sensitive single-minded nature and not to be *able* to return that love." She added, without indicating recognition of any personal bearing in these words: "I thought you showed great ignorance then, but now I think you were right."[43] She never admitted to anyone that she had loved him except intellectually. When, on 13 December 1886, she was in disarray and wrote to express what he and others interpreted as passionate desire, she construed it quite differently, complaining that she had been badly misunderstood. How could Karl, the one man with whom she had seemed to share "love and friendship without any sex element," misinterpret her so? "All that my sexual nature had to give I gave years ago, and it is *agony* now when men call on me for what my nature has not to give. . . . I've loved Karl better than anyone else in the world ever since I was at Portsea Place, but it's just the absence of sex feeling that has drawn me. I can't bear sexual relationships any more even shown in a kiss."[44]

[41] Schreiner to Ellis in Draznin, *"My Other Self,"* letter 499, 12 Feb. 1887; also letter 498, 31 Jan. 1887. This discussion of Pearson's physical weakness is perplexing, since he was robust and athletic throughout his adulthood and took pride, for example, in his long treks through the Tyrol.

[42] See also Brandon, *New Women and Old Men,* 56.

[43] Schreiner to KP, 3 July 1886.

[44] Schreiner to Ellis, 31 Jan. 1887, in Draznin, *"My Other Self,"* letter 498.

These disavowals, whose sincerity is unmistakable, are not quite inconsistent with a sexual passion on her part. He had told her of his suffering, and she remained, as she had told him, under the sway of a "Hintonian feeling (not idea!)" that she ought to sacrifice herself sexually for a man in need. This was the rationalization, if not the reason, for offering herself to Pearson. She believed his health to be delicate, and that the unbearable suffering brought on by sexual abstinence, which he had discussed at the club, might be a danger to him. In July 1886 she had told him that her keenest sexual delight would not be to absorb the whole attention of a man, but to give him the strength to be alone for months and to concentrate on his work. There is a scrawled, undated postcard in Pearson's file of Schreiner letters, probably from November or December 1886, containing just these words: "Karl Pearson is there nothing I can do to help you? Are you suffering physically?"[45] Two months after her breakdown, and his refusal, she declared once again to Ellis her own antipathy to sex, and explained, against all the evidence, that Pearson was similarly an asexual being. "If I thought him capable of even the same amount of animality that is beautiful in other men, something would be gone from my life that would never come back to it. If a sex relationship were useful for his health or happiness of course I should enter on it, but I should feel that a great beauty had gone from my life." She added that his letters to Lucy Clifford seemed to express "great agony & depression, but he must work out life's problem for himself. I shall not help him."[46] The next day she concluded, quite inscrutably:

> When I say I haven't sex feeling for Karl, & that he thinks I have, I'm not talking of physical passion at all. Karl would never misunderstand me on that point. But that much more brutal selfish kind of feeling that wants to take a person's *soul* up & say "*this* is mine." I suppose we all have to love with *that* kind of sex love before we love with the other. If I were a frail person whom you thought dying of consumption, & with a horror of ALL physical relationships, then your love for me would be like mine for Karl.[47]

This "horror" of physical relationships, and possibly also the tuberculosis, would seem to be pure fantasy, elements perhaps of an unwritten novel of friendship and despair starring a reconstructed Karl Pearson. In subsequent letters she offered other versions of their personal or impersonal attachment. "I don't love him but we divide one drop of blood between us," she declared in April 1887. Karl "will love me when all of you have

[45] Schreiner to KP, 6 July 1886 and undated.

[46] Schreiner to Ellis, 12 Feb. 1887, in Draznin, *"My Other Self,"* letter 499. I have silently substituted "even" for "ever" and "of" for "o[f]," because these are the only words that make sense, but have left out the imputed plural in "life's problem[s]."

[47] Schreiner to Ellis, 13 Feb. 1887 in ibid., letter 500.

forgotten me," she said a few weeks later. In January 1888 she told Ellis of "the peculiarity of Pearson's mind that he stimulates almost to agony." Finally, after Pearson told her of his marriage in 1890, she summed up her feelings for him: "*Friendship* may be increased by absence. Whenever I didn't see Karl Pearson & thought only of his work & . . . the terrible disease he had told me he was dying of, I loved him with a strange intensity, but the moment I saw him or came near him, a kind of constitutional antipathy seemed to put him far from me."[48]

However interpreted, the episode created complications for the Men and Women's Club. One crucial figure in these exchanges was Brian Donkin, also a member and Schreiner's physician as well as her would-be lover or husband. On 13 December 1886, as he explained to Pearson in a letter that same day, he had found her "in a state of complete temporary madness—and being without her normal control, I gathered from her words for the first time what I have known of myself for long, that she loves you." He admitted frankly that he was in love with Schreiner, then begged Pearson to go to her immediately if he reciprocated her love at all. From Pearson's standpoint, this breakdown followed an increasingly desperate sequence of letters from Schreiner, who finally, on 12 December, had implored him as her "man-friend" for help in her current distress. "Find fault with me, please, if I am doing wrong; oh, my soul is so little, so little. Can't your larger one for a moment put out a hand to me?"[49] Pearson much later recalled "that night when I found her 'with tresses sweeping the ground,'" but the contemporary evidence does not suggest any personal contact on this occasion.[50] Instead he sent a letter, in which he probably reminded her that their friendship was strictly as man to man, and told her they could not be lovers. In response she thanked him for his directness, and denied that "sex-love" was in any way involved. She knew all about Donkin's role in perpetuating what she called a misunderstanding. If Pearson indeed told her, as she would later claim, that friendship between them had become impossible, then he did not act on his words, but continued to correspond with her, and to worry about her health and happiness. She, on the other hand, began to deny that they had ever been more than fellow inquirers:

> From the beginning of our brief acquaintance, when at Portsea Place you treated me with something like brutality because the paper I was labouring under had gone beyond my grasp, you have dealt with me with hard truthfulness, which I liked. There has been no time when you have suggested to me that

[48] Ibid., letters 503, 505, 512, 561. I have omitted a few editorial markings.

[49] Donkin to KP, 13–15 Dec. 1886, Pearson Papers 840/6.

[50] KP to MSP, on the occasion of Schreiner's death, 2 Jan. 1921. From KP to MS, 14 Dec. 1886, we learn that Pearson attended a meeting of the Men and Women's Club on the evening of 13 December in a condition of great distress. Schreiner was certainly not there.

> you valued my friendship in any personal sense. You are charging yourself entirely without cause when you suggest such a thing. . . . I have never imagined that our friendship was of a personal kind such as might have existed between yourself and Parker, for instance.[51]

One other party to this turmoil was Elisabeth Cobb. Although Schreiner, as we have seen, did not think Pearson and Cobb were lovers in a sexual sense, she and Cobb recognized each other as competing for Pearson's intellectual love. He must have known something of this from their letters to him, though his insight into such matters was very limited. Donkin tried to explain how they could be rivals: Cobb, he said, may have "what is called popularly a sentimental friendship for you, such even as hardly Mrs. Grundy would object to," and so may have slighted Schreiner. Pearson must have responded with anger, for Donkin felt compelled to "accept your rebuke without reserve, and fully and heartily apologize to you for the letter." But he could not change his mind. "There is a side to the question which you on your part do not see."[52] Or at least there was a side Pearson was unwilling to admit. He wanted to believe that the noble ideal of intellectual friendship between the sexes had at least proven possible with Mrs. Cobb, if not with Miss Schreiner. Otherwise, it seemed to be threatened by infatuation and jealousy on every side. He had been strongly tempted to give way to Schreiner's passion, he later recalled—perhaps now rationalizing to himself the fear that kept him from coming to her in her hour of need—but had recognized that she could not be his "fitting mate," because a woman given to such violent passions would soon fall in love with someone else. From the experience he professed to have learned (and probably did) that platonic relationships between men and women were dangerous, and must be kept within limits.[53] It was an awkward time for such a lesson, since he was by then conscious of his own love for Maria Sharpe, secretary of the club.

The personal entanglements created by Pearson's friendship with Schreiner, as well as his more general reflections on women, strongly encouraged the commitment to the impersonal and the objective that he had first articulated in response to historical debates about the German Reformation. It was by no means simply a position taken against women or in

[51] Schreiner to KP, 30 Jan. 1887, in Rive, ed., *Olive Schreiner Letters,* 121. One example of his continued concern: early in his provisional engagement to Sharpe, Pearson asked permission to inform Schreiner as soon as the marriage plans were settled, in hopes that this might provide a kind of closure for her. KP to MS, 10 Aug. 1889.

[52] Donkin to KP, 15 Dec. 1886 and undated, Pearson Papers 840/6.

[53] See KP to MS, 8 Sept. 1889, and especially KP to MSP, 2 Jan. 1921; Helga Hacker to Betty Fradkin, 15 June 1975, Hacker Papers, Box 7. I do not know if Hacker's comments are based on other sources beyond these letters.

opposition to Schreiner, even if she did sometimes assume the role of defender of the emotions. She idealized him as intensely as he ever idealized the women in his life, imagining him innocent of worldly corruptions. "Look deep into your heart," she once enjoined him, and ask if "your bitterness against Hinton" is wholly free of resentment against having been called Hintonian. "It would be such a terrible thing if while you seemed to be fighting only for abstract truth and right there was an element of self in it. I can't bear to think of this. You must be so absolutely pure and fleckless. My life is so broken and flawed it is always far from the ideal but you must keep close to it."[54]

Whatever may have drawn Schreiner to Pearson, it took her years to get over him. Her marvelous caricatures during the time of her disappointment, while they contain a clear element of truth, are anything but disinterested descriptions. Eight months before her crisis, she had written him that the "most ideally perfect friendship between a man and a woman that I know of is one where the man in addition to sympathy with the woman's intellectual nature, feels that she is to him also sexually perfect." After the trauma of 13 December, she idealized her relationship to him for its absolute aloofness from personal matters, its freedom from every hint of gentleness or affection. About a year after the crisis, she asked him to lend her £30—which he did—but not to include a letter of any kind. "I have many friends from whom I might ask this, but in all cases there would be an element of personal feeling and friendship which would make it painful to me. In your case I obviate this; and only in your case can I feel in absolute trust that the matter will not be mentioned."[55] After his marriage in 1890, she thought she could at last write him without being misunderstood. "It was exactly that cold, hard, intellectual element in your nature which was of service to me. If you had required any emotional return from me, if you had turned the emotional side of your nature, noble and beautiful as it doubtless is, to me, you would not have been to me what you are."

What she saw as his hardness, indeed, now inspired in her a kind of reverence. In January 1889 she spent "all the last days waiting in the rain before University College hoping to catch a glimpse of him as he passed, but I didn't. I felt so when my father died."[56] And from Edward Carpenter, arts-and-crafts radical whose rebellion "against the intellect and conscious reason" was to her the precise opposite of Pearson's "blaspheming against the emotions and the instinctive reason," she begged for a tangible reminder of Pearson:

[54] Schreiner to KP, 26 Oct. 1886.

[55] Schreiner to KP, 4 April 1886 and 5 Oct. 1887, in Rive, ed., *Olive Schreiner Letters,* 75, 130.

[56] Schreiner to KP, 24 May 1890; to Havelock Ellis, 8 Jan. 1889, both in ibid., 174, 146.

> If you ever should go to Mr. Pearson's again, would you send me something out of his garden; pick it for yourself. You know my heart lives always in that little study in Hampstead; it is like a little chapel to me; it is all so beautiful to me. Now I know that he never wanted my friendship I can rest. It's to me as if he was buried personally but so beautiful to know he's alive and working impersonally.
>
> I'm writing something very lovely, Edward, it isn't really the intellect and nature that are at war, it's the PERSONAL AND IMPERSONAL.[57]

In fact, this relationship of personal to impersonal was far more complicated than warfare. For Schreiner and Pearson alike, the impersonal world of inquiry was not cold and detached, but permeated by powerful emotions of hope and yearning. Schreiner wrote passionately of the attractions of knowing. As a young man, so did Pearson, as in his praise of Spinoza's *amor dei intellectualis* and his ecstatic depictions of nature. Increasingly, however, he looked to reason to master these overpowering emotions, cultivating a detached, rationalistic understanding of the natural world, and indeed of passion as well. Having been drawn irresistibly to a sexualized nature, he proceeded to intellectualize sex.

Historical Research on Women

This tension of the personal and the impersonal, so pervasive in the lives of Pearson and Schreiner in this period, had also an integral role in the dynamic of the Men and Women's Club. Although their discussions of marriage and sexual feeling during the first eight months of the club's existence generally assumed a universal "woman" and "man" and rarely appealed explicitly to anybody's experience, revelations of the most delicate nature, never fully separable from the personal, were still inevitable. It was the women who were most often put under the microscope; Cobb complained to Pearson in July 1885 that the club behaved "as if *man* were the only human being and woman only another species of monkey."[58] Schreiner was insistent enough on occasion to reverse the relations of inquirer and subject, extracting from Pearson, for example, an estimated proportion of his male friends who remained chaste before marriage. Also, Pearson could not but reveal much about his own inner life with his ruminations, clunky in their detachment, on sexual feeling. This recourse to the universal became for him a characteristic mode of public self-revelation after he gave up writing fiction.

[57]Schreiner to Edward Carpenter, 12 April 1888 and 21 Jan. 1889, in ibid., 139, 147.
[58] Cobb to KP, 6 July 1885, quoted in Bland, *Banishing the Beast,* 40.

Still, most members were probably relieved, as Maria Sharpe explained in her autobiographical history of the club, when in early 1886 they turned from emotional to historical questions. Pearson had from the beginning wanted the club to provide a scholarly forum on issues involving women and sex. Although the scientific mode, which on the whole was more familiar to the men than to the women, created its own tensions, the opportunity to converse on this level was welcomed particularly by the women of the Club. Over the next three years, the members wrote and discussed papers on marriage, prostitution, and relations between the sexes in many times and places, from prehistory to ancient Greece and Rome to medieval Germany and Russia to contemporary society. Pearson, as organizer and as a bold and tireless scholar, tended to set the agenda for these discussions. As with the trajectory he defined for economy and religion, which had passed from an appealing but defective "Catholic socialism" through a lamentable but necessary phase of Protestant individualism to the threshold of socialist freedom, he developed also for the history of women and of reproduction a broad vision of what may be called dialectical progress, with unmistakable relevance to his own day. This involved a passage from a primeval "mother age" through an era of Protestant patriarchy to a collective order that would restore dignity and independence to women while subordinating reproductive choice to the urgent needs of the state.[59]

Pearson's introduction to social and historical writing on women may well have come from a book by the leader of German social democracy, August Bebel's *Woman under Socialism* (or *Woman in the Past, Present and Future*).[60] Bebel set out from a depiction of the distant past, when woman was the equal of man in size, strength, and brain weight, as in some African tribes, he wrote, of his own day. This proved, to him as to Pearson, her capacity to be the equal of man. Historically, however, she had eventually been forced to look to man for assistance during periods of pregnancy, birth, and lactation, and in this dependent condition she degenerated biologically. In recorded history, he observed, her position had always been a subordinate one. The Greeks kept wives strictly for procreation while allowing displays of sensuality and intellectual refinement only

[59] See Walkowitz, *City of Dreadful Delight,* 154–155; also Sharpe, "Autobiographical History," and "Minute Book of the Men and Women's Club, 1885–1889," Pearson Papers 10/1.

[60] Bebel's immensely successful book has a confusing publication history. It appeared originally in 1879 as *Die Frau und der Sozialismus.* In 1883 a new edition appeared under a different title, which was translated into English in an undated edition in 1885 as *Women in the Past, Present, and Future.* Two decades later a version was translated as *Woman under Socialism,* and many reprints have appeared under both titles in German and English. Hunt, *Equivocal Feminists,* 31.

among courtesans (hetaerae), such as Aspasia. The Christian doctrine of mortification of the flesh was profoundly hostile to women, although it never succeeded in wholly suppressing the "healthy sensualism" of the German Middle Ages, which was reasserted by Luther. But the Protestants punished sex outside marriage with inexorable severity, and the life of woman within bourgeois industrialism had come to involve great hardships.[61] Bebel looked to the teachings of Darwin, Marx, and Henry Thomas Buckle to support a brighter future.

Pearson cited Bebel appreciatively in 1885, and this book was actively circulated within the Men and Woman's Club, but he soon came to a more negative view. Whereas Bebel identified the origins of society everywhere with the patriarchal family, Pearson was soon converted to belief in the ancient matriarchy. This was the teaching of Johann Jakob Bachofen, whom Bebel had invoked for an argument—later adopted by Pearson—that ancient prostitution was a religious act, deriving from primeval promiscuity. Bachofen's *Mutterrecht* or "Mother Law," published in 1861, credited women with the founding of civilization. By Pearson's time, these ideas were discussed internationally within the women's movement. Bachofen was a Swiss patrician and a colleague of the great cultural historian Jakob Burckhardt at the University of Basel. As a student in Germany, Bachofen began to oppose the strict political history that had become so influential there. He regretted Theodor Mommsen's dismissal of mythology and religion in his works on classical civilization, and he was repelled by the modern, militaristic Prussian state. In a moment of epiphany, looking down from a hill over Mycenae, he came to comprehend the bloody, vengeful savagery of the Trojan War, which stood in stark contrast to a maternal "world of infinite sweetness and gentle ways, a world so vigorously blooming in all the joy and beauty of youthful strength."[62] He found the traces of a feminine order in ancient mythology, passed on in Homeric epic from a preliterate age. Women were the inventors of agriculture, and mother-law characterized an earthly, corporeal ethos, which men were always wanting to abandon for the ethereal cosmos. He summed up the contrast: "There [among the women] material bonds, here [with men] spiritual development; there unconscious regularity, here individualism; there devotion to nature, here rising above it."[63]

[61] Bebel, *Woman in the Past, Present and Future,* trans. (1885?) H. B. Adams Walther (reprinted, London: Zwang, 1988).

[62] Gossman, *Basel in the Age of Burckhardt,* 177; also Schorske, "History as Vocation in Burckhardt's Basel." For the English reception see papers by Edward B. Tylor and C. Staniland Wake in *Journal of the Anthropological Institute of Great Britain and Ireland,* 9 (1880) 3–9 and 235–248.

[63] Johann Jakob Bachofen, *Das Mutterrecht* (1861), *Gesammelte Werke,* vols. 2–3 (Basel: Benne Schwabe, 1948), 54, 55. On theories of matriarchy, see Coward, *Patriarchal Precedents.*

Although Bachofen's book was a theory of human development, which defined the mother-age as a phase in the evolution of society, his materials and even his explanations were drawn from the world of mythology. Pearson, too, believed that the evidence of myths and of folklore gave the most conclusive indication of the mother-age, but he aimed to go still further to a "rational" history of society, one that would move beyond the characterization of particular ages and identify the "axioms of historic growth."[64] By about 1885, this for him meant historical explanations linked to biology and to property relations, and his biological turn provided further incentive as well as rationale for his continued attention to sex and reproduction.[65] While he modestly foreswore any claim to be the Newton or Darwin of history, he thought of himself as providing the materials for a genuine historical science. For the long premodern period, this meant a history of material factors, of economic and sexual transformations. He drew on Darwin, who imagined unconstrained sexual promiscuity among early humans, and on anthropological studies of kinship and marriage by such authors as John F. McLennan and the American, Lewis Henry Morgan. The decisive argument for matrilineal inheritance in Pearson's time, reiterated by Friedrich Engels, was biological. Before a certain stage of civilization, with its more settled sexual relationships, was attained, paternity would remain untraceable.[66]

Pearson's work on the history of women and of sex dealt mainly with Germanic languages and peoples and was thus continuous with his studies of religion and folk culture. Attention to folklore, he declared, must destroy the philologists' assumption that language had formed under patriarchy. Hence the time "is an opportune one for a raid" on philology. He found matriarchal and transitional residues in many fairy tales, as in the common device of ascending to kingship by marrying the king's daughter, and he proposed strategies for recognizing when stories had been reoriented by switching the sex of the protagonist, as in the conversion of Ash-Hans to Cinderella. For the philologists, he presented an accumulation of some thousands of word linkages in languages stretching across Europe and southern Asia to show that a modern folkloric understanding of matrilineal society provided the only way to make sense of

[64] Pearson, "Sketch of the Sex-Relations in Germany," in *Ethic of Freethought,* 396.

[65] Pearson, "Socialism and Sex" (1887), in *Ethic of Freethought,* 430.

[66] Friedrich Engels, *The Origins of the Family, Private Property, and the State* (1884) (New York: Pathfinder Press, 1972), 68, identified the "overthrow of mother right" as "the *world-historic defeat of the female sex,*" and drew on Bachofen as well as Morgan. Although this German book was then little known in England, it was discussed at the Club, and Donkin asked Engels to present a paper there. See Engels to Donkin, 25 March 1886, Pearson Papers 10/36; MS to KP, 12 May 1886.

current expressions for sex, kinship, and relationship.[67] These were his "fossils," keys to the recovery of a world that lacked a written language. Pearson was very much drawn to Bachofen's project, which in a way had already been his own before he learned of Bachofen, to reason from the scattered and fragmented clues of language and mythology back to a social world that must otherwise be concealed in the mists of time.

He aspired, however, more than Bachofen to use his understanding of the deep past to reinterpret modern society, and indeed the possibilities of the future. There was no distinct "prehistoric" for Pearson. He saw certain polarities—such as individualism and socialism, "brute-appetite" and renunciation—as fundamental cultural elements in a dynamic of human progress. Pearson's long-term histories of family and reproduction overlapped with, and to a degree subsumed, his studies of religion and economy in medieval and Reformation Germany. Society and morality, he argued, first arose when primitive individual appetites began to be controlled in the interest of the group. Civilization was created by women, who were able to stabilize social groupings in part by maximizing the "sexual tie between individual members" as well as the "kindred tie between successive generations." This they achieved through what he called, following a discussion by Morgan, "kindred group-marriage." In Pearson's version, this meant in practice that fertilization occurred through great annual "sex-festivals" involving bands of women and of men. Out of the base instincts of sex grew higher moral values of peace, trust, faith, charity, and freedom, which, however, were applied only within the group. A language of foreignness defined outsiders as alien and ignoble.[68] Within these tight female bands, it was possible to create the settled life of agriculture, a distinctively feminine achievement, still disdained even in his own day in the more primitive regions of Europe by lazy, "barbarian" men. Women also were responsible for the beginnings of medicine, the domestication of animals, and the invention of spinning. They created a distinctive set of religious beliefs, involving goddesses of fertility and ceremonies of the hearth as well as wild sex rituals, all of them morally valid in their time and place. Even the morals of modern times "have their origin in what some are pleased to term base and loathsome animal passions." Such sources did not degrade the higher morals, but exemplified what for Pearson was in effect a sexual theodicy (or *historiodicy*), by which

[67] Pearson, *The Chances of Death:* "Ashiepattle: Or Hans Seeks His Luck," vol. 2, 51–91 and "Kindred Group-Marriage," vol. 2, 92–245, on 98, and 112–238.

[68] Pearson, "Kindred Group-Marriage," 93–95, 241–245; Lewis Henry Morgan, *Ancient Society* (1877; Cleveland and New York: Meridian Books, 1963), part 3. A different sort of sea festival, scripted by men, was described as a basis; for Australian aboriginal societies by A. W. Howitt and L. Fison, "From Mother-Right to Father-Right," *Journal of the Anthropological Institute of Great Britain and Ireland,* 12 (1883), 30–46.

animal desires have been transmuted into worthy and dignified social emotions.[69]

The arguments of Schreiner and Brooke had convinced him that the sexual drive of women was as strong as that of men, and potentially still more disorderly. In an extensive and painfully academic correspondence with Maria Sharpe prior to his declaration of love, he explained to her that "the inequality of desire" was limited to a few women "in our middle classes." This new belief in intense female sexuality stimulated him to the deepest reflection. It inspired his arguments for the orgiastic rituals of the era of mother-right. Continuing in this anthropological vein, he abandoned his former understanding of contemporary prostitution, which might not after all be a consequence of capitalistic manhood running roughshod over the sentiments of innocent and vulnerable women. Maybe the brothel was "a survival of the matriarchate," an institution made by women and not merely by lustful men.[70]

There was unmistakable alarm in his reaction to the possibility of aggressive female sexuality, and for this he has been caricatured. In fact, whatever his instinctual views, his arguments on this subject were deeply considered and rather complicated. He argued consistently that women had as much right to sexual gratification as did men, and that none should be condemned for their personal sexual choices. In the course of confessing to Sharpe, at the time of their initial engagement, his own shortcomings of personality and character, he signaled unmistakably his acceptance of the possibility that she might have sexual experiences in her past, even though he did not. He hoped that she could someday share this and other aspects of her background, and offered reassurance that nothing in this line would be held against her. "Someday, perhaps, if you wish it, you shall tell me the story of your earlier friendship. It may mean something gone, which you cannot give again and which I have no right to expect."[71] In response to her suggestion that men enjoy highly sensual women as companions, but prefer the colder, safer variety as marriage partners, he denied it vehemently.[72] Notwithstanding all this, he became strikingly sensitive to female sexual aggression, complaining, for example, of how often women in their twenties, for money or merely for gratification, seduce much

[69] Pearson, "Woman as Witch," in *Chances of Death,* vol. 2, on 4, 27, and the newspaper report of his lecture at the Somerville Club on "Evidences of Mother-right in Mediaeval Witchcraft" (dated 20 Dec. 1890 in the catalog of Pearson Papers, but 1891 by Pearson in the printed version, "Women as Witch"), Pearson Papers 47/4; "Kindred Group Marriage," 244–245.

[70] KP to MS, 14 June 1887. Sharpe may already have been convinced; see "Autobiographical History," 54.

[71] KP to MS, 8 Sept. 1889, referring to her earlier relationship to Sidney Courtauld. Two years later, Thomas Hardy told of Tess's terrible rejection by her otherwise gentle and understanding new husband after she revealed her prior sexual victimization.

[72] MS to KP, 12 Oct. 1887, and KP to MS, 13 Oct. 1887.

younger boys. He also worried that the emancipation of women might mean a return to the "swamp age," to a promiscuous sexuality that would destroy stability. Although he provided no mechanism for the dissolution of social order through rampant sexuality, he warned repeatedly of the danger. "It would be the death of human society were it to become morbidly sexual, even more so than it is."[73] For him, as for several women in the club, salvation was to be sought not in perpetuation of a sexual asymmetry, but in higher moral standards for men.

The triumph of patriarchy had meant an advance in efficiency, evidenced by its success in outcompeting mother-right all over Europe. The dark side of the mother age—its "human sacrifices, its periodic sexual license, its want of strong incentives to individual energy"—then gradually disappeared.[74] If, however, much was gained in the transition to a new phase, something fundamental was also lost with the disappearance of the autonomous, communitarian societies of women. Pearson was fascinated by what he interpreted as the survivals in Germany of mother-age customs and treated them very favorably. He argued that the late-medieval witch, for example, was "the degraded form of the old priestess" who had presided at an altar where men were not allowed. Witch gatherings recalled old religious rites, with "women dancing at night round the sacred trees and wells, torch or candle in hand," and their licentiousness pointed back to the mother-age sex festivals. Recognizing Walpurgis as a fertility goddess helped to make sense of Walpurgisnacht in Heidelberg, which he had described as fiction in his *New Werther,* and now recalled as experience: "Groups of maidens and students went up singing through the woods, there was dancing at the top, and waiting to see the sun rise."[75]

From this standpoint, the Church's campaign against pagan customs appeared as a corollary of patriarchal efforts to efface all remnants of the mother age. Under Catholicism, there had always been compromise, with the Virgin Mary taking the place of the old mother-goddess and providing a focus for the wildest expressions of sexual excitement, the ultimate source, he explained, of religious enthusiasm. Eventually, Protestants would take the lead in hunting down witches because of their hatred of the sensuality for which these women stood. Protestant men displaced onto others the responsibility for their own lustful passions, linking everything associated distinctively with woman to temptation, and hence anxiety. The woman's hearth, for example, became the witch's cauldron and was associated with the devil. Even now, Pearson remarked, many Protestants look

[73] KP to MS, 11 Oct. 1887 and 15 June 1888. The only rationale I have found for his linking of free love to social decay he enunciated much later, when he argued that rampant promiscuity would destroy the variation on which natural selection operated. See KP to MSP, 28 Dec. 1895; also his letter to *The Spectator,* 19 May 1894, 686.

[74] Pearson, "Kindred Group-Marriage," 96.

[75] Pearson, "Woman as Witch," 19–20, 25, 40, 47.

on worship of the Virgin also as "the mark of the devil." By the later 1880s, Pearson could insist on the positive value of this religious sensuality: "To me it seems the great triumph of mediaeval Christianity." It meant the adaptation of a Hebraic and Hellenic religion to the needs of Germany. It supported, through sublimated expression, the highest flourishing of architecture, music, literature, and painting, a cultural efflorescence that did not suffer, he argued, by comparison to the glories of ancient Greece. If the cult of the Virgin, that infatuation of rootless "strolling scholars," nearly brought about a return to the "swamp morality" of the mother age, its sensuousness was vindicated through idealization in "the highest forms of art."[76]

The new reign of individualism was a disaster for women and workers, and especially for wives and mothers, who became dependent on their husbands. By freeing the individual, the Reformation had created the conditions for the flourishing of science, but at immense cost to the poor and oppressed. The convents, which had provided opportunities for women to pursue education and learning, were suppressed. The idealized, chivalric view of women gave way to a widespread belief in her degradation, and the reimposition of sexual restraint on the married woman led inevitably to an "Age of Prostitution," the modern age. For marriage by capture, at the birth of patriarchy, it substituted marriage by purchase, which only quite recently had begun to be seriously questioned.

Pearson saw historical investigation as a vital tool of social reform and the emancipation of women. The historical spirit implied recognition that the modern order was contingent, that attitudes and institutions had been radically different in the past and could be transformed fundamentally in the future. The subordination of women, in particular, was not natural or inevitable but a consequence of a particular form of social organization. Women had once been strong and independent and would again become so in the next phase of historical progress. He did not look to an expansion of individual rights for the vindication of women. He dismissed the language of abstract rights as empty metaphysics, at bottom individualistic, and hoped to erect a "new *Zeitgeist*" of the social on the ruins of "the Bentham-Spencer view."[77] For this reason, he thought badly of John Stuart Mill's essay on women, and he believed its high standing among women must soon fade. Improved conditions for women would come about through the triumph of a new socialism, a system that would allow them to make choices and would be particularly beneficial for mothers.

In 1880, when Pearson converted to socialism, the woman question had had no significance for him, apart from the crucial point that he

[76] Pearson, "Sketch of the Sex Relations in Germany," 411, 414–417; also KP to MS, 6 July 1885.

[77] KP to MS, 19 March 1888.

blamed prostitution on the capitalist system. Neither did it figure in a socialist lecture he delivered to a Deptford working-men's club in February 1884. There he had called upon "labourers of the head" to join Ruskin and Morris in teaching capitalists a "higher morality" and proposed to restore the long-lost power of labor by giving guilds a role in municipal government as well as by broadening the franchise. He also offered a gradualist alternative to Henry George's "revolutionary" call for the nationalization of land—he would simply convert all freeholds to hundred-year leaseholds.[78] During the years of the Men and Women's Club he became increasingly contemptuous of utopian moralizing and appealed more and more to Darwinian struggle and the crushing force of historical development. In a line much quoted by his opponents, he urged socialists to "inculcate that spirit which would give offenders against the state short shrift and the nearest lamp-post." His faith in the efficiency and justice of the state—in its abstract, idealized form, as opposed to any really-existing state—was almost unbounded and invited mockery. The political economist Herbert Foxwell, commenting on one of his more memorable examples, said in a letter that he had "acquired that independence of facts . . . which is the hall-mark of the genuine Socialist. The idea of an English railway manager as a 'private capitalist *struggling* to fill his own pockets,' in contrast to a state official 'liable to instant dismissal if failing in his duties' will be both *new* and *entertaining* to most of those interested *either* in railway enterprise or the Civil Service."[79] Pearson, however, had little respect for the dismal science, arguing that political economy should be "intelligible to the average human mind," and that the struggle for existence rather than laws of rent and interest was what mattered for human society. Ever more the quantifier, he now proposed the determination of wages and of prices with a measure of "useful labour" or "social value." Living from capital was to be despised. "The socialist toe tingles" to eject those "endowed idlers."[80]

Worse even than the capitalists, however, were their wives, the shopping dolls, living, it seemed, from services that ought to be wholly outside the economic system and contributing nothing to society. "Fitzjohn" the businessman may be a brutal Philistine, but at least he goes to the City daily and does some work, whereas his wife "Fitzjoan" and her daughter "think life is busy when they arrange dinner parties, & go shopping. The male is nothing, but the sexual male for them. Fitzjoan is even more anti-social than Fitzjohn. She is *inert*."[81] Pearson, third wrangler, applied the

[78] Pearson, "Socialism: In Theory and Practice," in *Ethic of Freethought,* 362, 365–367.

[79] Pearson, "The Moral Basis of Socialism" (1887), in *Ethic of Freethought,* 324, 332; H. S. Foxwell to KP, 5 Aug. 1887, Pearson Papers 694/7.

[80] KP to MS, 4 Feb. 1889; Pearson, "Moral Basis of Socialism," 344, 326.

[81] KP to MS, 21 Oct. 1888.

views of meritocratic Cambridge even more acidly to women than to men, linking idleness to prostitution. Paradoxically, if women refused to take part in the man's world of work and ideas, this reduced the man also to a sexual being, at least in marriage, so that the degradation was reciprocal.

He had a scheme to restore some of the feminine self-sufficiency of the matriarchal age within the coming socialism. No more than men would women live as parasites or exploiters. They would provide an important service to the state and be compensated for it. This would allow them to work, if they wished, in traditionally male occupations, but he emphasized another possible form of worthwhile female labor. The indispensable contribution of women to the life of the state was bearing and rearing children, which would now be made independent of any financial contribution on the part of the man. The availability of "preventive checks" would allow women to make sexual choices without necessarily assuming the burden of maternity. Indeed, for the latter they would need to seek authorization. State support should be conditional on social sanction in advance of the pregnancy, and so Pearson introduced broadly eugenic conditions from the beginning into his scheme of socialized reproduction. Critics attacked his program as destructive of the family, reducing women to prostitutes of the state. He argued, however, that it would make marriage a pure matter of affection, excluding economic considerations and thus putting the accent on friendship and love. Sexual monogamy would become more common than today, he predicted, and having regained their independence, women would become once again, as in the era before patriarchy, physically and mentally strong.[82]

In 1889, when the Men and Women's Club dissolved, Pearson was best known not for his mathematics, which divided into highly speculative ether models and a dull compilation of mathematical theories of elasticity, but for his historical and social writings on women. In the late 1880s and 1890s, he was seen as a leading authority on the woman question. His writings were invoked in America as well as Britain in support of protective legislation on behalf of female workers and were cited respectfully by women, especially by Fabian socialists such as Brooke, Mona Caird, and Harriet Stanton Blatch, who became intellectual leaders of the women's movement.[83] It deserves to be noted that while the Men and Women's Club, and his correspondence with such women as Emma Brooke and

[82] Pearson, "Socialism and Sex" (1887), in *Ethic of Freethought*. Among the critics, J. Ellis Barker, *British Socialism* (London: John Murray, 1908), 339, 347, cited Pearson's opinions on family and eugenics as the *reductio ad absurdum* of socialism.

[83] Dyhouse, *Feminism and the Family;* Beals, *Fabian Feminism,* 95; DuBois, *Harriet Stanton Blatch,* 76. Both [Emma Brooke], "The Position of Women: Its Origin and History," *The Woman's Signal,* I, 8 March 1894, 155, and Mona Caird, *The Morality of Marriage* (London: George Redway, 1897), 63, situate their work on the matriarchate in relation to Pearson.

Charlotte Wilson, provided stimulation as well as a forum for these ideas, his was a powerful, original voice. While limited proposals to support women in the immediate aftermath of childbirth were discussed at the time in Germany and elsewhere, his scheme of state-endowed motherhood was a distinctively radical one, which continued for some time to be associated with his name.

Brooke proposed a similar idea at about the same time, and her letters to him show how this came about. She wrote him on 14 November 1886, soliciting his help with an essay she had promised to read for the Fabians on "The Economic Position of Women." His reply asserted the inseparability of the economic from the sexual, and she told him in her next (undated) letter that she intended to make his proposals the skeleton of her theme. On 13 December, probably following the logic of his response to her query, he read a paper on the topic to the Men and Women's Club, outlining for the first time a plan for the socialization of motherhood. Brooke finally sent the syllabus of her paper a few days later, February 18, and he replied with a printed version of his essay, which in the meantime had been published in the journal of the Social Democratic Federation, *To-Day.* She responded finally in February, avowing that she was "much pleased to find you have anticipated me in the idea of State Support of Motherhood. Then it is not a wild notion." A bit later, when she sent him the text of her paper, he attacked it so severely that she lost heart and tried to withdraw from her commitment to present it to the Fabians. They insisted, however, and she repeatedly begged Pearson for a detailed critique, which at last he seems to have sent. When, with much trepidation, she at last read her paper to the generally unfeminist Fabians, they surprised her by receiving it enthusiastically.[84]

Pearson continued to take a special interest in women's issues throughout his life and favored, for example, the opening of universities and careers, and the gradual extension of suffrage, to women. He thought these developments inevitable. Increasingly, though, his interest in women's issues was subordinated to his advocacy of a new socialism. Sometimes he expressed hope that the habit of subjection had at least accustomed "woman . . . to think of others rather than herself."[85] At other times he worried that women, having for so long been stifled by patriarchy, would

[84] Walkowitz, *City of Dreadful Delight,* 156; Emma Brooke to KP, Pearson Papers 10/28. (His letters to her do not survive, and their content must be inferred from hers to him.) Maria Sharpe records in her "Autobiographical History of 'Men and Women's Club,'" 42 and 47 (Pearson Papers 10/1), that on 10 Feb. 1887 he told the club he had secured an anonymous paper on "Women's Sphere in Modern Society" for their March meeting. A bit later he expressed surprise at the similarity of the ideas it contained to his own.

[85] Pearson, "Woman's Question" (1885), 19; Burdett, *Olive Schreiner and the Progress of Feminism,* 51.

naturally favor for a time the expansion of individual rights, and he hoped this might be balanced by the element of maternal selflessness. But such values would be dangerous if, by deferring to man, the woman helped perpetuate his tendency to egoism.

Marriage, Egoism, and the Doll's House

In October 1888, in the midst of an intense but resolutely impersonal correspondence with Pearson on desire, sex, and the circumstances of women, Maria Sharpe asked him to suggest a project that could make her life useful, and that might be suited to her interests and capabilities. Pearson had provoked her with a tirade on the idleness of the childless middle-class woman, which she was unable to read as merely abstract. Believing, as he did, that women could and should make their own choices, he was loath to take charge of her research, but he suggested an immense project on medieval peasant wars. Although she had already, with some guidance, investigated European laws on prostitution from 800 to 1500 and was attracted by the possibility of writing a scholarly work on some topic other than women, this new proposal was too daunting. Drawing inspiration from another suggestion of Pearson's, she prepared a study of the characters of men and women in Henrik Ibsen's plays. After that she determined to prepare a translation of Ibsen's *Brand* into English.[86] In the summer of 1889, a few months after the Men and Women's Club held its last meeting to hear a report by Pearson on Francis Galton's *Natural Inheritance,* she journeyed with her sister Loetitia and her inseparable companion Lina Eckenstein to Norway to see the country, work on her Norwegian, and possibly to communicate with Ibsen himself.

Ibsen and Norway were becoming fashionable among the politically advanced in England in the later 1880s. On matters Nordic they were somewhat behind the Germans. Ibsen had lived as an expatriate in Dresden and Munich as well as Rome from about 1864 to 1891, and his first big success outside of Norway involved Berlin productions of *The Pillars of Society,* the pioneering work of his new "social realism," in 1877. In the wake of Bismarck's antisocialist laws, the left's appreciation of Ibsen rose as its reverence for Goethe's classicism declined. A still greater sensation was created in the fall of 1880 by productions of *The Doll's House,* although some theaters performed a bowdlerized version in which Nora's stunning abandonment of her insensitive, condescending husband and their children to develop her

[86] See Walkowitz, *City of Dreadful Delight,* 163–164; KP to MS, 21 Oct. 1888; MS to KP, 24 Oct. and 8 Nov. 1888; KP to MS, 4 Nov. and 9 Nov. 1888; Sharpe, "Autobiographical History," 78–80.

Figure 9. A world of women: Loetitia, Julia, and Maria Sharpe. (Courtesy of UCL)

individuality was reversed by a negotiated return to hearth and family. Nobody knew how to soften the impact of his *Ghosts* (1881), in which the tragedy follows precisely from the refusal of the upright Pastor Manders to accept the love of Mrs. Helena Alving; he counsels her instead, in the name of patriarchy and in defiance of his own emotions, to return to her cruel, philandering, syphilitic husband. Conservative opinion in Norway and Germany was scandalized by this play, as it would be a decade later in England.[87] But Ibsen had admirers in England before he acquired opponents. These were generally men and women of the left, such as Eleanor Marx and Edward Aveling, who had discovered Ibsen by the early 1880s. William Archer, among Ibsen's most important early advocates and translators, was also an acquaintance of Pearson. Although Pearson must have known very early on of Ibsen's German reputation and this emerging English one, it was only in the period of the Men and Women's Club that he evinced any interest in the Norwegian playwright.[88]

The opening of a full production of *The Doll's House* at the Novelty Theater on 7 June 1889, with Janet Achurch as Nora, is the outstanding

[87] Bernhardt, *Ibsen und die Deutschen;* Meyer, *Ibsen: A Biography.*
[88] Ackerman, *Ibsen and the English Stage;* Britain, "A Transplanted Doll's House."

event in the reception of Ibsen into Britain. Pearson was there, having arranged a block of seats for the men and women (formerly) of the club. *Brand,* a very long play, written in verse and, like *Peer Gynt,* full of magical changes of scene, could scarcely be performed on stage. While it had little role in the transformation of the British theater, its reputation among Ibsen's admirers was at least on a level with that of *Doll's House,* and there were many efforts to translate it during the 1890s.[89] Bernard Shaw, an influential Ibsen interpreter before he achieved success as a social dramatist in his own right, described the eponymous character Brand as a dangerous fanatic, and the play as a satire. "Brand dies a saint, having caused more suffering by his saintliness than the most talented sinner could possibly have done with twice his opportunities."[90] It is difficult now to read the play otherwise, but the young author who wrote it in 1865, having recently arrived in Rome and been transported into an almost apocalyptic fury by the refusal of Norway and Sweden to support Denmark against German aggression, found much to admire in the noble idealist he created. A more earnest Victorian than Shaw, a noted Schwärmer himself, studying it in the late 1880s, had to agree. "As for my 'geistige Entwickelung' " [spiritual development], Pearson wrote Parker from Saig in 1888, "it is summed up in one word 'Ibsen.' I am more & more impressed with him & *Brand* as I gradually wade through it in the original with dictionary & grammar grows bigger & bigger. It outgrows,—nay it has outgrown *Faust* and the giant of the north marks really a new age, as Goethe did."[91]

How much did Pearson recognize himself, by now an unstinting champion of self-sacrifice for the sake of the State, in the character of that relentless and yet murky idealist, Brand?

> I hardly know if I'm a Christian;
> But that I am a man—I know quite well:
> And I am sure that I can see the flaw
> Which saps our nation's marrow everywhere.

Agnes, Brand's idealized wife, follows him with the greatest reluctance, sometimes pleading, sometimes rebuking:

[89] Pearson asked a publisher in 1891 about the translation of *Brand* and was told of the need for haste since everyone seemed to be translating this work. T. Fisher Unwin to KP, 7 March 1891, Pearson Papers 866/6.

[90] George Bernard Shaw, *The Quintessence of Ibsenism* (1891; 3d ed., 1922), in *Major Critical Essays* (London: Constable, n.d.), 44. Shaw read his Ibsen paper to Karl and Maria Pearson before presenting it to the Fabians; see Stanley Weintraub, ed., *Bernard Shaw: The Diaries* 2 vols. (University Park: Pennsylvania State University Press, 1986), vol. 1, 678, from Shaw's diary, 17 Dec. 1890.

[91] Henrik Ibsen, *Brand* (1866), trans. with introduction by G. M. Gathorne-Hardy (Seattle: University of Washington Press, 1966), introduction; KP to Parker, 5 Sept. 1888; also KP to MS, 23 Aug. 1888.

> And to a race so helpless in its fall
> You cry your awful slogan—Nought or all.

Brand, unmoved, is merciless to Agnes, to his mother, and to the beloved son whom he, godlike, sacrifices:

> Humane!—Ah yes that limp and feeble word
> Is made the universal slogan now!
> It is used by every shirker to disguise
> His cowardice and lack of enterprise.

Above all, Brand allows himself no respite from the most rigorous ideals, but chooses the cause for which he will fight, never giving an inch of ground until finally, in a reckless ascent, he is consumed by an Ibsenian avalanche. Pearson identified Ibsen's genius with his "power of seeing two sides" of such characters as Brand and Peer Gynt, "and putting them both equally strongly."[92]

Pearson's first references to Ibsen date to early 1887. In the summer of 1888, he spent much of his stay in Saig learning Norwegian from Sigrid Zöller, the Swedish wife of a German land inspector and philosophical author. Mainly because of a shared admiration for Ibsen, the Zöllers and Pearson became very close. The Pearsons would later name their first two children after them, a choice that reflected also their attachment to Norway and to the sagas.[93] Maria Sharpe had for some time been working to learn Norwegian, and her journey to Norway in 1889 was above all for literary purposes. Pearson also had scholarly reasons for the voyage: to improve his Norwegian, and to learn about the folklore and peasant culture of an interesting Germanic people, as well as to escape the London routines and take in some glorious scenery. He also had another purpose. Having recently learned that his father would not, after all, forsake his London life and his wife for the ancestral lands in Yorkshire, Pearson was now freed from a possible obligation to share the small house in Hampstead he had recently rented with his mother. That, and the dissolution of the Men and Women's Club, allowed him to contemplate new living arrangements.

In late July, he and his traveling companion Ralph Thicknesse, accompanied as ever by *Baedeker,* met up with the Sharpe party in Opheim, where he felt encouraged by her warmth. It is difficult to imagine that she

[92] Ibsen, *Brand,* 45, 94, 105; KP to MS, 24 March 1889 and 31 Oct. 1888.

[93] See KP card to MS, undated Jan. 1887. The name Sigrid is also to be found in one of Ibsen's historical dramas, as Pearson pointed out when he informed his mother of her birth: "I hope to send you in a few days Ibsen's play of the Vikings with its character of Sigrid, I think you will be interested in it." KP to Fanny P, 2 May 1892. The play in question is *The Pretenders,* already available by then in translation. The character of Sigrid is distinguished by her great piety. Egon and Sigrid Zöller's letters to Pearson are in Pearson Papers 906/4 and 906/5.

could have been entirely unprepared for his declaration of love, in view of their extensive correspondence and frequent meetings over the previous five years—its ritual impersonality not quite concealing various indications of friendship and affection. In the summer of 1888 he had invited her to visit him at Saig. Nevertheless, the marriage proposal, delivered on a scenic bridge by an intensely anxious suitor on Sunday morning, 28 July 1889, came to her as a shock. Pearson subsequently explained her failure to ponder in advance the possibility of marriage as a natural consequence of the passivity that was cruelly demanded of women in such matters. She should now be given time to reflect, he resolved, and so, as a man of principle, he declined to ask for a quick reply, but left her in peace. She would then have the opportunity to consider her future without pressure from him, and also to continue the language study that now framed her scholarly ambitions and that had brought her to Norway in the first place. So weighty a decision, he argued, should not be made on impulse, but as a settled conviction, based on the fullest possible knowledge of its implications. Having felt his own love for her grow over a period of at least three years (his mother's suspicions were aroused by his visits to the Sharpe household in Stanmore, and depression afterwards, as early as July 1885), he no longer felt any doubts of his own commitment.[94]

Only with the greatest struggle had he maintained the appearance of detachment for so long, and now the prospect of a favorable outcome took away his habitual reserve. His need to tell his own story, the irrepressible New Werther, surfaced once more, in the guise of warnings of what it would mean to be married to such a man as Karl Pearson. "One wants to make a confession of all one's weaknesses, prejudices, and pettinesses and it is so impossible. They cannot be recorded by the self, only seen and learnt by very long & intimate acquaintance." Still, it was too much to hold in his emotions and self-doubts, and his unveiling was more easily undertaken on paper than in person. Karl's outpouring of confessions, concerning his character and "inherited tendencies," commenced just two days after his marriage proposal, in a letter posted in Ulvik, on the Hardanger Fjord, at the beginning of his southward flight to his summer retreat in Saig:

> My Father comes of a sturdy peasantry, strong and passionate to almost ruthless selfishness. I have inherited some of his strong physical nature, much of his selfish & passionate tendencies, and a life of study & too much loneliness has only enabled one to repress them by an almost equally vicious tendency to periods of depression & moroseness. Add to this a hypersensitiveness and self-consciousness derived from my mother and you will have a picture which may look black—too black when it is seen all at once.[95]

[94] Fanny P to KP, 26 July and 6 Aug. 1885.
[95] KP to MS, 10 Aug. 1889 and 30 July 1889.

The face he normally presented to the world, he explained, was mere sham. He had imagined for a time that he "had acquired a perfect power of crushing all emotions at will," but this proved illusory. He often played the *Spötter* (the mocker) as his German friends called him, a role that derived from the "joke-philosophy" of his Cambridge days, and it had with the years become increasingly habitual. Yet he was all too conscious that it was only a mask, which at times fell irresistibly away. If he was often blunt and cynical, inside he felt weak and vulnerable, even feminine. "I always attribute the two inconsistent elements to the divergent characters of my Father & Mother. To keep the latter [the delicate, sensitive aspect] alive as *das Innere,* and to convert the former into *das Äussere,* the mask only, has been the only possible mood of getting through life. To let the blunt element satisfy itself in ridicule of the sham emotional, the outward expression of feeling," while taking satisfaction in studying this irrational domain, these hidden springs of action: this was his way. In his public life, the inward essence and superficial exterior were reversed, with reason simulating solidity and pretending to mock an exterior façade of passions that it knew to be deep and powerful. "It has been an inconsistency, but an inborn one, to take reason as the sole guide of conduct in theory and most often in practice, but under it all to be about as unreasonable a bag of emotions as can well be found outside pure hysteria."[96]

These dark revelations were of course also proofs of his humanity. Karl emphasized his vulnerability to show that he was no pillar of impersonal reason, to be respected and admired, but a fallible man in need of sympathy and affection. He was in no way insincere, neither in his confessions nor in his avowal of love. His life story was also, however, for him a little drama, a passion play, with the last acts remaining to be performed, in which Maria had been scripted into a definite role. She was not the Magdalene, but a more earnest character whose warmth required to be released. He supposed that her mask of dispassion, like his own, "must sometimes be maintained at real cost of physical health." This stifled emotionality was perhaps what he called, in the same letter, the "'Brandian' spirit," so at odds with that "ideal of the union of sensuous and intellectual pleasure" for which he longed. Her ostensible detachment, which indeed she cultivated all the more assiduously to avoid the weaknesses of women, had, as he explained, sometimes vexed him, and he was delighted on those rare occasions when he could detect a hint of personal interest beneath.

These were perceptive observations; her personality was perhaps even more guarded than his. One indication is her reaction to his letter from Bergen, just before she and her companions set sail. Ever the romantic en-

[96] KP to MS, 4 Aug. and 27 Aug. 1889.

thusiast, he had not yet found in Norway the exotic locale of untouched nature and uncorrupted peasants he was seeking, but only another city on the English tourist circuit. "He has, I think, a larger capacity for disappointment than anyone I know," she commented in a letter to Parker. Her announced policy was never to let her expectations rise. She was also, in her way, as suspicious of sentimentality as he was. Indeed, she made no exception for religion. One of their tenser moments prior to his proposal of marriage followed from his condemnation of Unitarianism, the faith in which she was raised, for seeking to base religion on rationality rather than sentiment and tradition. She had, in fact, strongly criticized the Church in 1884, before she knew Pearson at all well, in response to a Unitarian appeal to "the shining oriental imagery coined in the heart of Jesus." This she condemned as "an indulgence of the emotions, where clear-sighted realization of facts is the first and all important necessity.[97]

He wrote to her often of service to more exalted ends and of moral ideals rather than of pleasures. One crucial question to be settled, if she consented to his proposal, was what form their union should take. He had long preached that marriage should be free of legal constraint, arguing that this very freedom would promote lifelong commitment. In March 1889, Maria had declared her belief in the same view. Immediately he began to find reasons why she should avoid avowing her principle openly, and a few months later when the issue could no longer be treated as hypothetical, he argued in favor of legal marriage. Particularly crucial was the problem of impersonality: if they argued for free unions while living as an unmarried couple, their reasons might be dismissed as self-interested. And mere forms, perhaps, were not really so important, for "what we want now-a-days is an ideal of the inner relation of the sexes, quite as much if not more than the external." This was the ideal of marriage as intimate friendship, a harmonious union of personal warmth and impersonal reason, in place of the unfortunate division of labor that defined the wife as angel by the hearth.[98]

He feared above all the hereditary egoism of Pearson men, of his father. In the fall of 1889, a few months after the first theatrical performance of Ibsen's *Doll's House,* Karl and Maria retained vivid images of the "doll" Nora and of the overwhelming self-centeredness that her husband Hjalmar had developed as the natural counterpart to her utter dependency. In

[97] KP to MS, 27 Aug. 1889; Sharpe, "Autobiographical History," 58, 61; MS to Parker, 9 July 1889, Pearson Papers 10/1; on Unitarianism, see KP-MS letters, late March 1889; also the anonymous letter by Maria Sharpe to *The Inquirer,* 1 June 1884, in Hacker Papers, Box 7.

[98] Walkowitz, *City of Dreadful Delight,* 164; KP to MS, 4 Aug., 14 Aug., 22 Aug. 1889; Harris, *Private Lives, Public Spirit.*

June, Maria had commented on this in a letter. Karl, seemingly born under the sign of egoism, was deeply anxious that it should not take over his own life, and so he was effusive in his letters about his desperate need for her help. And yet the rational man's egoism came in through the chimney when pushed out the door. His own family background, he explained, was at the root of his special concern for the condition of women, and he would do anything to avoid replicating his parents' marital situation. His mother, in her maternal role, stood for an ideal of unselfish love—"such a great, unlimited social force if it could only be directed into the right channels"—but if not, the cost to herself and to the moral position of her husband was monstrous. When the woman lets her life sink into routine, forgetting the possibility of unending self-development, marriage becomes "anti-social in its influence." "I do not fear the occasional friction," he told Maria in his first letter after Opheim, "but I do fear a self-surrender on your part, which would gradually develop in me just those characteristics which have made my early childhood so painful a memory."[99]

His letters were in many ways tender and personal, yet behind them stood always a moral ideal, whose Brandian severity was rarely lightened even in the most intimate private space. His affection had taken a particularly odd form in the years leading up to his proposal of marriage, as in this bit of displaced lovemaking from June of 1888: "I hope that the freedom of sex, which seems a probable concomitant of the complete emancipation of women will be tempered by the general recognition of the life-long union as the richest form of sexual union, and the one which tends of all others to preserve social stability & increase social efficiency."[100]

For Maria, the charge to live up to the expectations of this extraordinarily energetic, versatile, and rigorously idealistic suitor was daunting. For some time she did not know how to respond to his outpouring, and when after eleven days she finally wrote him, she was oppressed by doubts, not of his love or sincerity, but of her own worthiness, her capacity to fill the role he had defined for her. Perhaps she was too old for him, being six years his senior; perhaps her work, which was unlikely ever to earn an income, was insufficient to raise her above dependency and dolldom. He reassured her that in a capitalistic order, much work, including her translation, could be of real social utility even though it was unpaid, and that the difference of age mattered not at all. The self-possession and independence he was looking for in a partner was impossible without a degree of maturity and experience. Symbiosis, he had told her in Opheim, means each destroying the other's life, and Maria was indeed far from docile. She had, more than any other woman of the club except Olive

[99] MS to KP, 11 June 1889; KP to MS, 10 Aug., 22 Aug., 30 July 1889.
[100] KP to MS, 15 June 1888.

Schreiner, stuck by her own views when challenged by him, and the paper she published at about this time on Ibsen's men and women is full of insight and intelligence. He was not drawn to her as a passive bride. Still, she did not look to make a career of resistance to an overpowering husband, and the impersonal terms with which he reiterated his need of her were precisely the wrong ones: "But I see [he wrote her] that only by close life with another will it be possible to hold in check the more selfish side & develop the more social side of my [written over 'one's'] nature."[101]

Although some letters from this period of crisis have disappeared, the causes of the difficulty emerge clearly enough. He had to convince her that he could love and respect her as she actually was. He told her again and again, though in language she must have found alarming, that all conscientious labor was honorable, "and only the want of any work the height of anti-socialism." In response to her worries that her inability to follow his scientific ideas would interfere with a perfect partnership, he said that she need only follow the spirit and not the substance of it. "Everything that helps us to understand physical nature better is really a stage in human freedom & in the higher stage which regards the mind without differentiation of sex." Besides, he went on, he had no great scientific talent, and his highest commitment was to his work on the woman question. This was not, he explained with irrepressible frankness, on account of "an enthusiasm for the emancipation of women in itself," but because "the socialist ideal must halt till woman sees further and more freely than she does today."[102]

Rather than calming her, Karl's letters and, after both returned to England in early September, conversations only aggravated the crisis. She expressed her feelings of inadequacy in a sequence of letters in October, concluding finally that she could help him best by leaving him alone, and that he should not visit or write her for a time. Her regular companion of those years, Lina Eckenstein, reported to Karl that Maria, blaming herself, had told her that "the love she can give you is evidently not of the kind you want." Can it be, Eckenstein added, "that you have not cared for what is really herself but for a creature of your dreams?" Finally in late October he seems to have understood how his preaching had frightened her and pleaded to her that his love was deep and personal.[103] And he respected her request for some time of solitude, promising to wait for her until she was

[101] KP to MS, 14 Aug. 1889. Most of her letters from this period, including this one of 8 Aug., have disappeared. On symbiosis, see Loetitia Sharpe to KP, 26 Aug. 1889, Pearson Papers 848. Maria Sharpe, "Henrick Ibsen and His Men and Women," *Westminster Review,* 131 (June 1889), 626–649.

[102] KP to MS, 21 Sept. 1889.

[103] MS to KP, 4 Oct., 11 Oct., 19 Oct., 22 Oct. 1889; Lina Eckenstein to KP, 11 Oct. 1889, Pearson Papers 680/3; KP to MS, 22 Oct. 1889.

ready, and asking for her friendship again if he could not have her love. For the next five months, he was as traumatized as she. He evidently attributed the reluctance to marry of his "puritan maiden" to fear of sex, and told one female confidante he met during this period, Alice Enfield, of a "triangular solution," to take away the threat by marrying a woman he did not love, in order to regain the friendship of the one he did. Enfield admired his generosity in refusing to cramp Maria's freedom, yet advised him: "Women cannot help liking to be compelled by the man they love."[104]

He refused this last solution, but acted instead through the mobilization of literature. On 17 March the silence was at last broken by a letter from Loetitia Sharpe: "Maria wants me to ask you if you wrote the article in 'Freedom' on 'The Lady of the Sea' and if you sent it to her, as she thinks you did."[105] This Ibsen play, which Karl and Maria had discussed the previous summer, is about a young woman, Ellida, who is obsessed with the sea and feels alienated from her much older husband, Wangel. The sea means freedom to her and is associated also with a mysterious seaman, who, like freedom itself (and like death?), frightens and yet fascinates her. His arrival in port, and his demand that Ellida sail away with him, sets up a series of crucial choices. Ellida demands of her husband "that you and I release each other of our own free wills," and when, after tortured indecision, he lovingly grants what she has asked, she is finally freed from her obsession, refuses the seaman, and begins at last to live happily with her husband.[106] Possibly the anonymous review in *Freedom* was indeed by Pearson, although the ideas and style of writing leave doubts. The message, in any case, was strikingly apropos. Wangel, the reviewer explained, had been drawn to Ellida after the death of his first wife by "the emotional excitement of a strong attraction of the senses," but her suffering and need had "gradually changed his selfish passion into a devoted love." Although reluctant to release her, since her emotional struggle had manifestly clouded her judgment, he determined in the end that he had no choice but to put aside his hopes, barely allowing himself to imagine that she would let him continue as her "friend and helper." For this deed he was rewarded. His "generous and unselfish conduct in the crisis of her fate rouses her admiration, her gratitude, her enthusiasm; to his boundless surprise and joy he sees that her heart is opening to him . . . as never before,

[104] Alice Enfield (a friend of the Sharpes) to KP, 8 Dec. and 14 Dec. 1889, Pearson Papers 684/3.

[105] Loetitia Sharpe, to KP, 17 March 1890, Pearson Papers 848. He told Maria of reading the play in Norwegian in a single sitting, unable to put it down; see KP to MS, 9 Jan. 1889.

[106] Henrik Ibsen, *The Lady from the Sea* (1888), trans. Peter Watts, in *A Doll's House and Other Plays* (London: Penguin, 1965), quote on 306; MS to KP, 23 March 1890.

that it is himself whom she will love, his life that she will choose to share."[107]

A few days after making contact through her sister, Maria wrote to Karl directly, explaining how her nervousness had turned to terror, and explaining that she had at last learned to appreciate the kindness of his words during her crisis. Karl felt too much guilt to allow her to take the blame, and replied immediately to try to set things right. Yet the philosophical lover was soon trapped once more in that infinite regress of egoism. He had no right, he told her, to place such responsibilities on her for the sake of his needs, and he begged her to "mould" him "into something which would not pain or distress you." He wanted to send her his diary, which has not been preserved for the archives, but which must have revealed a tortured, self-doubting, and sometimes angry diarist. This was a terrible mistake, as he recognized within a week. "The sending it to you and the writing the letter which accompanied it were only part and parcel of the old ruthless egoism. The hideous thing is that I don't at all see this at the time I do these things, but imagine that I am doing them out of true affection for you." It made him wish he were no longer himself, and that he could be rid of these terrible recent memories. "I have no right to throw the responsibility of making myself upon you, however little my own power to alter myself."[108]

These remarks inspired once again her admiration for his generosity, accompanied by a profound feeling of unworthiness, which in turn fed his own despair at the egoism that somehow had led him to "make my ideal appear true to give itself something to feed upon." His language resembled increasingly a prayer to the blessed virgin, that feminine idol whose historical role he so admired, as he begged, in a letter written on Good Friday, for Maria's trust and faith, while declaring himself "wholly unworthy of it. I am at times hopelessly weak and blind." Or, in a darker mood, he imagined her as a Protestant God, and he among the reprobate. "I saw that the only possible salvation for me," he wrote on Easter Monday, after she had again turned away from him, was to install her permanently in his life and thoughts. "You might have saved me from myself, from marked introspection and selfishness." Yet renunciation was too hard. "I am not

[107] Anonymous review of Eleanor Marx's translation of *The Lady from the Sea* in *Freedom: A Journal of Anarchist Communism,* 4, no. 40 (March 1890), 10–11. I suspect that Charlotte Wilson had a role in this paper, founded in Oct. 1886, which was devoted to the cause of women, celebrated Kropotkin, and kept abreast of matters Norwegian. Earlier issues include anonymous appreciative reviews of Pearson's essays on socialism and the woman question in April 1887 and Oct. 1888 (the latter refers to his "luminous and thought-provoking originality"), and by S. O. (Sidney Olivier) in Nov. 1888.

[108] KP to MS, 24 March and 31 March 1890.

strong enough to be true to my ideal that would not whisper a bitter thing of you. . . . Oh pardon my sending you such a last letter as this, pardon my love being so hopelessly selfish."[109]

In his anguish, he sought refuge in literature. Writing to Parker on Easter Day about the terrible vicissitudes of his relations with Maria ("I do not and never shall understand women"), he professed to change the subject: "That is more than enough of the personal." Parker "& others" had so often talked of the virtues of George Meredith that he had resolved to put aside his negative reaction to *Richard Feverel* and to try once again to read him. Meredith happened to be one of Maria's favorite authors, one whom Pearson too would praise lavishly in later life. But at this moment, Meredith only added to his torment. Sir Willoughby, who was given the title role in *The Egoist,* must have appeared a disagreeable caricature of Pearson himself. "I know this, that my aim in life is to be generous," Willoughby declares, with characteristic sanctimoniousness. He explains how he had forsaken classics for science: "Science is modest; it masters men; of necessity, not with a stupid, loud-mouthed arrogance." Yet he refuses to give back to his betrothed her freedom when she realizes her mistake and thereby compels her to flee him if she will not marry. In his final humiliation, as he is about to be rejected by the last of the women he has tried to string along, he begs her: "I believe I do now know myself. Anything you will, only give me your hand; give it; trust to me; you shall direct me. If I have faults, help me to obliterate them."[110] Pearson complained that Meredith's characters were pure individualists, incapable of growth or development, and that they were concerned only with their own happiness and oblivious to all social questions. For them, love reduced to "the sex-passion." Parker responded that he had at first felt just the same on reading *The Egoist*. "I imagine most men would detect something of themselves in Sir Willoughby." He had not presumed on lending Pearson the book that it had "any particular bearing on your personal experience."[111]

On Easter Monday, the evening after he wrote to Parker and within hours of his bitter parting letter to Maria, Karl addressed her again, now apologetically, hoping to relieve the pressure. In a much calmer and more conciliatory exchange over the next week, they discussed love, fear, and renunciation. She explained how she had come to understand his weaknesses, but also his "undoubting love," and tried to take responsibility for

[109] KP to MS, 2 April, 4 April, 7 April 1890.

[110] George Meredith, *The Egoist* (1879; London: Penguin Books, 1968), 359, 376, 594. See Beer, *Meredith: A Change of Masks.*

[111] KP to Parker, 6 April 1890; Parker to KP, 7 April 1890.

the crisis: "I am the disgraced woman & you only the injured man." He reiterated, quite unaffectedly, that he loved her personally, not for some ideal, offering his resumed friendship and time to consider whether marriage or renunciation was the right course. On 13 April, the next Sunday, they met to discuss matters calmly, with happy results. "I understand you better," she wrote him on Tuesday, "when you are trying in a broken way to express your innermost feelings than when more as an artist or a writer you have worked out some well-rounded story of what our relation should be." And thus he at last won her on the basis of the very personal contact, not of brain to brain, but of heart to heart. In June they were married. For their honeymoon they traveled to Norway, where they worked at their Norwegian, contemplating its bearing on "primitive Aryan" habits, studied Germanic folklore, and—at least he proposed this—read James G. Frazer's just-issued *Golden Bough* to each other.[112]

The problem of ideals was not easily put aside. He was an irrepressible intellectual and ideologue, and within days of the restoration of their engagement he was lecturing her against pity. "We have to remember that our society is engaged in the hardest of all struggles against surrounding societies & against natural forces, and individual selfishness inside that society is likely to make it rotten to the core. It is the social instinct one wants to strengthen." It might be said that he celebrated her in an impersonal way with his last writings on the woman question, even if they largely followed in the direction he had mapped out during the period of the Men and Women's Club. He opposed individualism for independent women, as he opposed male individualism, favoring instead an "Independent Woman's Party" along with the "Independent Labour Party" to pursue new arrangements of property and ownership for the sake of a more efficient society. Once the woman's movement reached beyond the middle classes, he argued, it would recognize the need for protective legislation, especially for mothers, under the broader rubric of socialism. He continued to support equality of opportunity for women, but assumed that marriage and motherhood were not generally compatible with full-time careers outside the home. "Women who abstain from marriage and have not the sex-impulses strongly developed," he declared, cannot be the model for society. The woman's movement, he wrote a few years after his marriage, is changing "from the cry of the unmarried for equality of opportunity to the cry of the married for the reconciliation of maternity with the power of self-determination." In reply he offered his earlier solution of regulation and state support of childbearing and child rearing, "national insurance against

[112] KP to MS, 7 April 1890, MS to KP, 8 April and 15 April 1890, KP to MS, 23 June 1890, and intervening letters; KP to Macaulay, 30 Aug. 1890.

motherhood," allied to an increasingly severe program of selective breeding for the sake of that most urgent need, national efficiency.[113]

One imagines that such lectures may have endeared him less to Maria than his letter a few days before the wedding, telling her how much his Aunt Lizzie had liked her. "I expect she had got it into her head that I was going to marry a peripatetic suffrage-platform & moral-reform phonograph, and the reaction at finding there was blood & flesh in you has brought tears to her eyes." He became, to all appearances, an affectionate husband and attentive if demanding father of the three children she bore, even if he was soon more obsessed than ever with his work. It would seem, however, that Maria was always troubled by her inability to live up to his ideals. She published, in later years, a few reviews and participated in a desultory way in such organizations as the Fabian Women's Group. Later she helped him to organize social occasions involving his biometric and eugenic laboratories and prepared artwork for his public lectures. But both recognized that this was nothing like an independent career. With his decisive turn to statistics and applied mathematics soon after their marriage, she found it impossible to understand his work and greatly regretted her incapacity.

There is an apologetic letter from her in the files, written almost twenty years later, explaining how the work of raising children had rendered "full partnership" with him impossible.[114] Indeed, there is little evidence of continued intellectual comradeship in the correspondence they exchanged after their marriage. In 1927, after her health had broken, he wrote to her sister Elisabeth Cobb explaining how he had failed as a husband by devoting so much of his time and energy to his work rather than to wife and children. In view of the troubled circumstances of their engagement, he said, he should have realized "that I had still to win her. . . . I blame myself for never having really won her confidence." This letter, which has too often been taken at face value, was among other things a highly pertinent literary idealization. "So all the time we've been together, I've never really won you," declared Dr. Wangel to his wife in that crucial document from Karl and Maria's traumatic engagement, Ibsen's *Lady from the Sea*. The letter, or (since it was never sent) confession to posterity, expressed his

[113] KP to MS, 18 April 1887; Pearson, "Woman and Labour," in *Chances of Death,* vol. 1, 226–255, on 238, 255; first published in the *Fortnightly Review,* 1894. In a letter to Sharpe on 21 March 1887, he had argued that the woman question was more urgent for married than for single women.

[114] KP to MS, 23 June 1890; MS to KP 2 Jan. 1898 and 28 Dec. 1917. For her activities outside the home, see Pearson Papers 9/7, including a review of *Hedda Gabler* from *The Woman's Herald,* 31 Jan. 1891, 227, and an article, "Henrik Ibsen's Heroines—a Defense," *The Woman's Signal,* 16 Aug. 1894, 100; also Fabian Women's Group, *Three Years' Work, 1908–1911* (London: G. Standring, n.d. 1911).

black depression during her illness as well as a recurring fear of not deserving to be loved and is no reliable account of their life together. Within a week of this unsent letter she had convinced him that his provocation for this outburst, her seeming distrust of him in relation to her will, was pure misunderstanding, and that her affection was undiminished.[115] Yet there is something tragic, after all, in the gap between an idealized vision of marital partnership and the actual possibilities of their life together. Disappointment was almost inevitable, given how much he had invested in the transformation of marriage, of woman, and of himself.

He was ever the intellectual visionary, ever identifying the personal with a higher purpose and a purer life. Seven months after Maria Pearson's death, in 1928, he became engaged once again to be married, now to one of the workers in his laboratory. A week after that, his new fiancée was in doubt. "I cannot analyze my affection for you," he tried to reassure her, "and if you say, as you did, that it is not to yourself but to an ideal, I would reply that every man who loves raises the woman he loves to an ideal, and it is good for both of them that he does."[116]

Conclusion: Women and the Conquest of Self

As an intellectual matter, Pearson refused absolutely to reduce the dignity and worth of women to the interests and needs of men. "The possibility of woman's individual development," he wrote, is vital. There can be no baser argument for woman's education than the one that it makes her a better companion for her husband, for this "denies her individuality."[117] In some ways, his deep commitment to the equality of women shaped or at least reinforced his moral vision of science. The "intellectual love" that he first associated with Spinoza resurfaced in the 1880s as a rubric under which men and women could share, perhaps equally, the life of philosophical friendship that he had discovered at King's College. His strengthened commitment to impersonality was not only a retreat from the failure of this ideal, as friendship "from man to man" degenerated to "sex-passion." It was also an affirmation of what Schreiner had called the "touch of brain on brain," valued no less by the women he knew than by the men. For Pearson, impersonality was an alternative to an excessive preoccupation with the baser instincts which, when ascendant, reduced woman to prostitute.

[115] KP to Elisabeth Cobb, 2 April 1927, "Never sent" (see discussion of this letter in chapter 1), Pearson Papers 9/6; Ibsen, *Lady from the Sea,* 306; KP to MSP, 10 April 1927.

[116] KP to Margaret Child, Pearson Papers 925. They did in fact marry.

[117] Pearson, "Woman's Question" (1885), 14–15.

Figure 10. The happy family. Karl and Maria Pearson, with son Egon and daughter Sigrid. (Courtesy of UCL)

At the same time, his faith in individual self-development, for women and men alike, was about male morality as well as female dignity. Woman, as mother, stood for something higher than self-interest. In the age of waning patriarchy, woman faced the temptation to confuse individuality with individualism, but a still greater threat to social progress came from the selfishness and complacency of men. Much of his career was shaped by a struggle against what he saw as the male Pearson egoism. His opposition to individualism was expressed through his admiration for passion plays and folk rituals, as well as through his ideological commitment to socialism. He looked to a transformation in the status of women, and specifically of the woman he loved, for a more intimate and personal check on his own egoistic tendencies. It was incumbent on woman not only to overcome her own individualism for the sake of socialist morality, but also, through rigorous adherence to an ideal of self-development, to control the individualism of man. He was thinking of one man in particular. What might be called Pearson's feminism was, like his scientism, part of a bold moral quest to realize the ideal of a socialist self.

In the crucible of personal anguish caused by his broken engagement, he came to recognize, if only episodically, the contradiction of placing responsibility for his own moral improvement on his beloved. He could not admit the still more fateful contradiction in his grand program of social re-

construction based on the supremacy of scientific method. Rather, he pursued with selfless enthusiasm a vision of the modern State, to be organized around the knowledge and impersonality of the rational scientist, the persona of the Pater, that he increasingly recognized as the core, and not only the shell, of himself. This was the form of impersonality that, after 1890, gave meaning and purpose to his career.

CHAPTER SEVEN

Ether Squirts and the Inaccessibility of Nature

> Your words reveal to me what makes a man of learning!
> What you can't touch, for you is leagues away,
> What you can't grasp does not exist at all,
> What you can't count, you don't believe is true,
> What you can't weigh is of no weight to you,
> And what you do not coin, you think of no account.
> —Mephistopheles to the chancellor in Goethe, *Faust II*

PEARSON MAY HAVE been the first to call metaphysics a species of poetry, and as philosopher of science he is generally remembered as a follower of Ernst Mach's doctrine that we can never get at any underlying reality. In truth his views were far more interesting and contradictory, an unstable combination of positivism that owed only a little to Mach with radical idealism. Metaphysics he found tantalizing, sometimes irresistible, and he longed to turn metaphysical intuitions into objects of sensory experience. Unlike Mach, Pearson took seriously the "thing in itself" as something infinitely remote, rather like Spinoza's God, who could never be asked to return our love. Valid knowledge, efficient summaries of experience, might, as he argued, be favored by natural selection, but untutored humans were ever being led astray by a desire for what science could never give. The inaccessibility of nature, this alienated human condition, required that science be formulated as a self-denying method.

At the same time, this doctrine defined a positive ideal for Pearson, as it had for Huxley, Clifford, and other Victorian advocates of science. In place of the certainties of dogmatic religion, they would install the scientific ethic of doubt and of evidence. Scientific method meant renunciation, a demand that we keep to the "hard and stony path of classifying facts and reasoning upon them," and never imagine "that we can enter the stronghold of truth by the burrow of superstition, or scale its walls by the ladder of metaphysics." To resist these temptations was not easy. "We must accomplish a task more difficult to many minds than daring to know. We must dare to be ignorant." But the rewards were great. Despite his ostensible positivism, Pearson rejected every doctrine that would wall off some aspect of the world as unknowable.[1]

[1] Pearson, *Grammar of Science* (1892), 20–21, 474. See Hollinger, "Justification by Verification"; Hollinger, "James, Clifford, and the Scientific Conscience."

His major philosophical work, *The Grammar of Science* (1892), had tensions such as these at its core. It was first of all about the ethics of knowledge, about the spirit of self-denial that overcomes personal interest and prejudice and defers to the possibility of empirical evidence. Society has need of consensus, and each citizen should accept as true only what is valid for everyone. His "scientific method" was almost universal, applying as readily to practical and political questions as to astronomy or chemistry. Yet without access to external nature, such agreement could be grounded in nothing deeper than the distinctive characteristics of the "normal" human brain.

In practice, Pearson the scientist was boldness incarnate, and he rarely if ever consigned a topic of possible interest to the inaccessible domain of metaphysics. Philosophy in his hands was, on the whole, scientific argument by other means, and in the years leading up to his *Grammar,* the science he most often addressed this way was physics. As mathematical physicist, Pearson wavered between exhilaration and despondency, the latter on account of his seeming incapacities, and the former when he thought he might have discovered a new basis for the comprehension of physical reality. No positivist restrictions would keep him from pursuing the reduction of matter to ether vibrations and of mechanics to hydrodynamics. In all three editions of the *Grammar,* from 1892 to 1911, he presented his theory of the most elementary atom as an "ether squirt," pouring into our familiar space from a fourth dimension. At the foundation of it all would he something entirely immaterial such as geometry, an attribute of mind, whose capacity to generate a world would someday be comprehended by science. Whether this geometry was a mere logic of description or itself the underlying reality remained ambiguous. Pearson longed through physical discovery to escape that confinement of self in a prison of appearances. His more positivistic utterances expressed skepticism about these ambitions, without quite dismissing them as futile. Pearson's physics, a branch of applied mathematics, wavered between metaphysics and renunciation.

Ethereal Physics

Pearson practiced physics during what has been called the "High Baroque phase of the mechanical world view." The critique of this tradition by Pierre Duhem, Catholic philosopher and physicist, is well known: the British had construed physics, ideally the quiet abode of reason, as the clanking and whirring of gears, wheels, and pulleys—in short, as a factory.[2]

[2] Klein, "Mechanical Explanation"; Hunt, *The Maxwellians,* 73–107; Pierre Duhem, *The Aim and Structure of Physical Theory* (1904), trans. P. P. Wiener (Princeton, NJ: Princeton University Press, 1954), 70–71.

Pearson, though not quite innocent of such modeling tendencies, expressed a similar disapproval of the clamorous ether machinery. Reviewing the same book that subsequently provoked Duhem, an introduction to electricity by the Birmingham physicist Oliver Lodge, he criticized Lodge for seeking to "'explain' the ether by mechanism." It would be difficult, he conceded, to check such tendencies, so long as "our chief physicist [William Thomson] is discontented, if he cannot rig up a battery of spinning tops to represent the ether, or develop a spring mattress by aid of bell-cranks and wires into a model molecule." Such mechanisms had never been satisfactory, not even in the hands, or rather heads, of the Greeks. "The amount of grease necessary to keep the crystal spheres moving would have destroyed their harmony for any less recondite philosopher than Pythagoras."[3]

Both extremes, industrial-scale modeling and austere analysis, were represented in the British tradition of mathematical physics. Maxwell's brilliantly original paper of 1856 on electrical field theory, for example, set out from an explicit mechanical analogy. In 1861 he illustrated his conception of electromagnetism with an image of molecular ether vortices, depicted as a lattice of hexagons separated by "idle wheels" whose flow represented the electrical current. Above and beyond the instrumental function of these analogies, their contribution to the derivation of new mathematical relations, Maxwell believed that electricity and magnetism were properties of a mechanical ether. Still, the particular representation was a fiction, and he later rederived the mathematics using a Lagrangian form of analysis that was independent of these ether contrivances. In this more abstract, analytical expression, Maxwell's mathematics was incorporated into the Cambridge Tripos, and in that form Pearson had lived with it as an undergraduate.[4]

Pearson's disapproval of the aloofness of this mathematics from practical physics, what he called "the old type of Cambridge teaching," matched or surpassed his dislike for the proliferation of springs and pulleys in the mechanical models. He spoke with ironic nostalgia of those "good old days when we used to solve complex problems in magnetism and light by the aid of bookwork definitions of physical quantities." The best that could be said for this Tripos mathematics was that it provided "an excellent discipline for the mind." If mathematical physics was to be science, however, it could not proceed from abstraction to abstraction, but must set out from physical facts. Even Lodge's "cogs and racks," wheels and

[3] Pearson, review of Oliver Lodge, *Modern Views of Electricity* (new ed.), in *The Academy,* 43 (11 Feb. 1893), 132–134. On Thomson's use of models, see Smith and Wise, *Energy and Empire,* 464 and passim.

[4] Hunt, *Maxwellians,* 12–13; Siegel, "Thomson, Maxwell, and the Universal Ether."

elastic-band molecules, might be defended as providing a check to the mathematician, "paddling in an ocean of superfluous analytics." The Cambridge mathematical physicist, under the current regime, was "a strange being who may be described as an applied mathematician without physical touch."[5]

Pearson feared that he was himself an instance of this odd genus, just as he worried at other moments about the luxuriance of his own physical modeling. As the next chapter shows, he took up the new methods of graphical geometry in order to combat these tendencies. Even as a student at King's, he had had his doubts about the forms of mathematics that prevailed at Cambridge, and by 1890 he was thoroughly disaffected. He even criticized a book by his mathematical coach E. J. Routh, whose testimonials had helped him to secure a mathematical post, in just such terms. "So long as the Cambridge mathematical school remains theoretical and analytical, Dr. Routh's problems must be almost indispensable to the would-be wrangler. But there are signs that Cambridge is at length aroused to the need of some touch with the practical and geometrical side of Mechanics."[6]

Pearson's interest in mathematical physics, which dated back to his student days, was never merely perfunctory. Despite his intense commitment during the early 1880s to the history of medieval Germany, he thought physics a more plausible career than history. His growing impatience with the bar, as well perhaps as the positive stimulus of new ideas about the ether, encouraged him to resume his mathematical studies in earnest toward the end of 1882. In December, he initiated a correspondence with an old King's College friend, William Herrick Macaulay, and their letters follow the trajectory of Pearson's mathematical work. Macaulay, who spent his career as a tutor, bursar, and vice-provost at King's, was a competent applied mathematician who kept up with the literature, but he was not really an original scientist. At first Pearson's letters focused on the theory of elasticity, a topic that grew out of engineering studies and that still lent itself to such investigations as of "the flexure of heavy beams," but that had taken on great scientific interest as the mathematics of the ether.[7] From time to time, Pearson revealed to the cautious Macaulay how he might be nearing a breakthrough on the relation of matter to ether, the

[5] Pearson, unsigned reviews of Lodge, *Modern Views of Electricity* (1st ed.), and of W. H. Watson and S. H. Burbury, *The Mathematical Theories of Electricity and Magnetism, The Academy,* 36 (1889), 322–324.

[6] Pearson review of E. J. Routh, *A Treatise on Analytical Statics, Academy,* 40 (1 July 1891), 38–39.

[7] For the interweaving of engineering and physics, see Isaac Todhunter, "edited and completed . . . by Karl Pearson," *A History of the Theory of Elasticity and of the Strength of Materials from Galilei to Lord Kelvin,* vol. 1 (1886, New York: Dovec, 1960), 696.

great problem of late Victorian physics. He dreamed of such achievements as the outcome of his own distinctive research program, without maintaining close ties to the leading physicists of his day.

J.B.S. Haldane would later characterize Pearson's statistical mathematics as "heaping Ossa on Pelion,"[8] one Greek mountain on another, and his mathematical physics was no less cumbersome. He swung a very large hammer to crack the infinitesimal elements of the ethereal continuum and yet failed to crack them. A single equation sometimes filled a whole page, and much of the art reduced to keeping track of the proliferating terms. He was inclined at first to the hypothesis pursued by William Thomson for decades, that an atom must be an ether vortex. Inertia, following this line, was like the resistance of a top to being overturned, and the forces of physics derived from interactions involving disturbances of these whirling atoms, propagating through the ether rather than as action at a distance. He was in many ways a follower of Maxwell in his analytical methods. But the inspiration for his first major scientific publications came from a Norwegian, Carl Anton Bjerknes. What excited him were some analogies between the hydrodynamics of the ether and the phenomena of electricity and magnetism. Perhaps the properties of matter could be derived in these terms; it seemed promising that two ether spheres pulsating harmoniously should behave as Newtonian gravitating particles.[9] He concluded the first part of his first paper with the thought that one might substitute for Thomson's "vortex sponge" a system of pulsating spheres, producing ether waves that generated the forces of attraction and repulsion.[10]

He wrote this paper in the manner of a serial novel, dating the first installment January 1883, evidently before the second part was finished. Alas, the continuation, dated February, didn't work out. He was unable, it seems, to carry out his intended application of "these hydro-magnetic forces to the theory of atoms," and he deferred that task to a promised third part. His customary boldness failed him, as he fished for some defensible results with which to conclude part two, and thereby to redeem this wild venture. It was not his brightest moment. "With certain assumptions, whose legitimacy may be perhaps contested, results bearing upon the collision of ships may be deduced." It seems that to shut off or reverse the engines of ships on a collision course may actually increase the danger. "These results are of course only of a most general character, and depend upon certain not entirely satisfactory assumptions."[11]

[8] Haldane, "Karl Pearson," 303–313.

[9] Friedman, *Appropriating the Weather,* 11–13; Kragh, *Quantum Generations,* 5.

[10] Pearson, "On the Motion of Spherical and Ellipsoidal Bodies in Fluid Media," *Quarterly Journal of Pure and Applied Mathematics,* 20 (1885), part 1, 60–80.

[11] Ibid., part 2, 184–211, on 204, 211.

Part three never appeared. In March 1883 he sent off to a different journal a "Note on Twists in an Infinite Elastic Solid," where he speculated that "sets of plane twist rings may be propagated through an elastic medium without losing their individuality."[12] But the grail he was now pursuing involved a vision of the atom as a pulsating sphere immersed in the ether. By July he had a draft manuscript on the subject to send to Macaulay, who asked for clarification of his purposes, then responded that while he had found no fundamental flaws, there were various errors of detail. Pearson was discouraged by his lack of enthusiasm, or perhaps by the inelegance of it all: "I . . . expect atoms will be shelved again for who knows when?"[13] "Who knows when?" was not so far into the future for the restless mathematician. Six months later he sent a draft on pulsating ether atoms to George Gabriel Stokes at Cambridge, one of Pearson's former teachers and a respected senior figure, who endeavored, with equivocal success, to be encouraging. His evaluation of the paper, as he reported diplomatically, "would be rather intermediate between the two extreme opinions you mentioned in your letter." Extreme alternatives, either a stunning discovery or utter trash, were characteristic of Pearsonian self-assessment, as with his passion play. He must have been discouraged, because ten months passed before he next presented his paper to a scientific gathering. When it finally appeared in print, two years after that, it bore multiple dates to provide a biographical record of his scientific achievement: 11 March 1883 for an appendix, 2 February1885 for the reading of the body of the paper to the Cambridge Philosophical Society, and finally an explanatory "note" dated April 1885. This publication initiated his last and most ambitious series of papers in mathematical physics. So far, nobody had shown much sign of being impressed.[14]

He did, however, find gainful employment. In 1884 he was appointed professor of applied mathematics at University College, London. He had failed in previous applications to Manchester and Liverpool, and also for the chair of pure mathematics at University College. The committee for this last had been impressed by the range as well as the intensity of Pearson's intellect, yet was worried that his great mental powers might not be devoted permanently to mathematics. His candidacy in applied mathematics, backed up by three new recommendations endorsing his suitability for this post as well as the printed application for pure mathematics with nine more testimonials, was successful against such stiff competition

[12] Pearson, "Note on Twists in an Infinite Elastic Solid," *Messenger of Mathematics,* 13 (1883–84), 79–95, on 90.

[13] Macaulay to KP, 27 July 1883, 17 Sept. 1883, 8 Oct. 1883, 16 Oct. 1883; KP to Macaulay, 27 Oct. 1883.

[14] Stokes to KP, 2 April 1884, Pearson Papers 862/6; Pearson, "On a Certain Atomic Hypothesis," *Transactions of the Cambridge Philosophical Society,* 14 (1887), 71–120.

as the senior wrangler Joseph Larmor, because Pearson was judged the better professor, even if Larmor was for the moment the more accomplished mathematician. It helped that Pearson had taught successfully as R. C. Rowe's deputy during the latter's illness.[15]

He also was invited, at almost the same time, to complete two books from the literary remains of deceased authors. One was William Kingdon Clifford's *Common Sense of the Exact Sciences;* the other was Isaac Todhunter's *History of the Theory of Elasticity and the Strength of Materials.* Clifford's book was elegant and concise, and the "editing" provided occasion for Pearson to develop his own philosophical ideas on physics. The sections he added to this unfinished text emphasized the element of human conventions in the mathematical laws of physics and rebuked those who relied on that "indescribable something termed *matter.*" Mass could only be known as a ratio of accelerations, and force was no more accessible. He insisted that we cannot comprehend the reasons for mechanical laws, but can only describe them. The book stimulated him to build on Clifford's bold mathematical restatement of physical questions, including an interpretation of gravity as the curvature of four-dimensional space.[16]

Todhunter's *History,* by contrast, was scarcely more than a compilation. Pearson was asked to take it on because in the Smith's Prize competition at Cambridge in 1879, he had given a new and better solution to one of the examination problems on elasticity, and Todhunter's note to this effect was subsequently found by his literary executors. The invitation, which he found flattering, soon weighed him down. Although there was no pressure to introduce much new material, and even some resistance by Todhunter's friends, Pearson could do nothing halfway. Within a year of taking the project up, he wrote Macaulay that "if the first volume ever gets done, then I shall excuse myself from the rest on the plea of pressure of work, that between ourselves, and gratify myself by recommending my worst enemy as a suitable editor."[17] In 1886 he finished that first volume, an ample 908 pages of analyses of papers and books, covering the whole period from the seventeenth century to about 1850. Far from abandoning the work, he pursued it with such determination that Cambridge University Press began fearing for its stocks of paper and ink. At one point he offered to give up his honorarium so the press would not cut his manuscript. The second part, covering the period 1850–70, was finally issued in 1893,

[15] See College Correspondence AM/C/141 and AM/C/148; also Applications: Mathematics, Applied, 1884, both in University College London, Library Manuscripts Room.

[16] Kegan Paul & Co. to KP, 24 Sept. 1884, Pearson Papers 732/7; Clifford, *Common Sense of the Exact Sciences,* ed. Karl Pearson (1885), 185–186, 242–243.

[17] KP to Macaulay, undated May 1885. His correspondence with Macaulay and with Charles Chree (Pearson Papers 658) document richly the technical problems of this work.

in two volumes of 762 and 546 pages. It was almost all by Pearson, who complained of the quality and reliability of his deceased coauthor's work, but it bore Todhunter's name as author, "edited and completed by Karl Pearson." The press did not take advantage of his offer to give up his compensation.[18]

We should not suppose that the dreariness of this task was absolute. Elasticity was a topic rich in engineering applications. It demanded, as Pearson said of one of its heroes, Barré de Saint-Venant, "a keen appreciation of practical needs, combined with a wide theoretical grasp."[19] Elasticity was also central to the theory of the ether, which was like an extremely stiff solid in its capacity to bear transverse waves and to transmit them at the speed of light while allowing the passage of the planets without detectable resistance. Pearson was not reticent about the significance of his topic, and in 1889 he responded to Oliver Lodge's claim for electricity as the "imperial science," by declaring that elasticity was more deserving of the title, unless both should prove merely branches of hydrodynamics.[20] In the *History of Elasticity,* however, his scientific commitments were occluded. He cut short all discussion of papers on the passage of waves through the ether on the ground that this belonged instead to the theory of light. He scarcely even hinted at his developing views on scientific method, or on the iniquity of reifying such scientific concepts as "force." Neither did this "history" open up into the larger domains of cultural history that, for him, were as relevant to science as to religion or economy.[21] The spirit of excess that he displayed in almost everything else was here reduced to an extravagantly dutiful and workmanlike effort, strangely selfless.

Nowhere did he explain why he devoted so much time and effort to this endeavor. It seems to point to serious doubts about his capacity to perform really original scientific work of enduring value. There are other indications of this, such as his open (but anonymous) lament in reading Maxwell and William Thomson that "we can only watch the feats of the

[18] James Porter to KP, 9 June 1891 and 2 Nov. 1893, Pearson Papers 819/6. For the second volume he received payment of £200.

[19] Todhunter, *History of Elasticity,* vol. 1, 872.

[20] Pearson, unsigned review of Lodge, *Modern Views of Electricity, Academy,* 36 (1889), 322–323.

[21] Thus he complained in a review of Oliver Lodge, *Pioneers of Science,* that the "born historian" would have seized on the trial of Kepler's mother as a dramatic meeting of old and new, providing "a mirror of the age in which he lived." See *Academy,* 43 (11 Feb. 1893), 133–134. In *History of Elasticity,* vol. 1, 34, Pearson remarked briefly on the theological aspect of Maupertuis' theory of least action, a point he presented more vigorously and extended to nineteenth-century theories of energy conservation, in his "Obituary of James Prescott Joule," *Academy,* 36 (1889), 272–273. His point was that theological assumptions, however obscure, could sometimes be productive for science.

Titans, and scarce recognize in ourselves, as we read, even the veriest reflection of their strength." After an evening of "metaphysical discussion" in the rooms of the young J. J. Thomson, recently appointed as successor to Rayleigh and Maxwell in the Cavendish chair at Cambridge, Pearson referred to him with no detectable irony as a "young genius." On the eve of his wedding in 1890, he explained to Maria Sharpe that he was regarded in Cambridge as "a second-rate mathematician who indulges in extreme views & dabbles in journalism. . . . I look back & round on all the odds & ends of careless & superficial work, which mark my life & make me shudder sometimes at the energy & time frittered away attempting what was not within my powers, or within them without the needful education & training."[22]

He experienced, however, episodes of attenuated humility, moments when answers to the great questions seemed almost within reach. In late August 1888, as he basked in the wet 6° C weather, he wrote to Sharpe from Saig of the immense joy of being alive. Not Ibsen's *Brand,* which he had just begun reading, but physics was responsible for his elation this time. "It's all the result of a close examination of the tremendous pace we are going forward in some directions that makes it so extremely delightful to be alive just now!" A "sudden resurrection" of his atomic theories of 1883 in two chemical journals explained his triumphant mood:

> I have been chuckling and crowing in private over my very superior understanding of five years ago and how much more universe can be solved in the same method now. I don't know how many memoirs I haven't planned but not begun! Joking apart, however, we do seem very, very close to some gigantic discovery like that of Newton—which in one sweeping flash will lay bare all the riddles & dark mysteries which are yet at the bottom of what we term magnetism, electricity & light.[23]

The resuscitated theory, which a few years earlier had left Stokes lukewarm, now evoked the ecstasy of the flash. His series of three papers of 1887 to 1891 "On a Certain Atomic Hypothesis," for all the density of their mathematics, expressed a bold and speculative understanding of the universe that went far beyond the available evidence, a confession of his metaphysical convictions that in its way was as personal as his passion play. To be sure, it was the heyday of ether theories, and Pearson was far from solitary. "That view of the physical universe which regards it as an absolutely continuous medium seems to be rapidly replacing the old molecular hypothesis," he announced at the outset of the first of these papers.

[22] Pearson, "Recent Works on Physical Science," *Academy,* 38 (1 Nov. 1890), 394–395; KP to Fanny P, 29 March 1885, Pearson Papers 924; KP to MS, 5 May 1890.

[23] KP to MS, 23 Aug. 1888.

"Let us note the difference, and it is a fundamental one, between the old and the new view of the universe, the old view endowed its atoms with certain inherent forces, and having done so, more or less completely ignored the existence of the medium; the new view endows its atoms with no inherent forces, but with motion. . . . The old view saw everywhere in the universe force, the new view finds everywhere motion." Citing Bjerknes, he proclaimed that the "whole problem of physics is reduced to one of hydrodynamics," and he aspired through a suitable conception of the atom to derive all the basic phenomena of physics and chemistry.[24]

His own discovery or invention was an alternative conception of atoms as spherical "portions" of ether with "natural pulsations" of fixed period. Due to the proximity of other atoms and the propagation of waves through the ether, there would be "forced pulsations" as well. Possibly the atoms were spaces of perfect vacuum, empty even of ether, with potential energy supported "in some manner" at the boundary. His modest project was to rederive the principal phenomena of chemistry and physics—to find an "analogy between the results of some motions of the atoms and phenomena which are usually classed as gravitation, cohesion, chemical combination, etc." He spoke not of causation but of analogy, indeed "analogies . . . of the vaguest description," and in the context of this paper, his doubts about the human capacity to get at real objects or real causes functioned as a license to invent. Positivistic doubt reflected his conviction that mass, force, electricity, light, and so on were merely what the human sensory apparatus could pick up of something more fundamental. But since his ether model so far had strange, almost inconceivable properties, he discarded physical plausibility as a criterion of a good theory and argued for the legitimacy of any hypothesis about the motions of the invisible ether if it appeared consistent with observation. For example, gravitation, as an attractive force, required the spheres to vibrate in harmony, and since it is universal, it followed that all atoms must share at least one pulsation of common period and phase. The implication deserved emphasis: *"All atoms in the universe of whatever kind appear to have begun pulsating at the same instant."* This he ascribed to "some not yet fully grasped physical cause." A physicist of a different temper might have found here a vestige of creation.

He also calculated spectra for polyatomic molecules. Stokes had cautioned him in 1884 that a correspondence of his deductions to "results of actual observation in spectral analysis" would not prove any genuine resemblance between the systems he imagined and those "actually existing." Pearson took the view here that correspondence was good enough. He

[24] Pearson, "A Certain Atomic Hypothesis" (1887), 71–72; Pearson, *Grammar of Science,* 309n.

may have supposed, as he would argue in 1892 in *The Grammar of Science,* that science can achieve nothing more. There is no explanation for why the ether moves, he wrote. "We cannot proceed for ever 'explaining' mechanism by mechanism."[25]

This first paper was finally published in 1887 after many delays, and by then he had long since given up hope of a favorable reception by physicists. Indeed, it fell flat, as he told Macaulay. During the last two years before it appeared in print, and then for one more afterward, he seems to have confined his more speculative urges to the theory of matriarchy. But the next year a paper by the German chemist F. Lindemann came to him as vindication of his earlier work. Lindemann, who shared Pearson's admiration for Thomson's 1884 Baltimore lectures, used the Thomson atom of shell and springs to understand refraction, light spectra, heat phenomena, chemical combinations, electricity, and magnetism. He was not a prominent researcher, and his paper in the proceedings of the Königsberg Physical-Economical Society would scarcely have forced itself on the attention of an English physicist. Pearson read this work in Saig, months before its official publication date, and someone there must have shown him Lindemann's original lecture. He was as thrilled by it as were other British physicists by Heinrich Hertz's experimental support for Maxwell's electromagnetic theory of light, which appeared at almost the same moment.[26]

The triumphalism of his letter to Maria Sharpe that August reflected his belief that Lindemann's results could be derived just as easily and naturally from his pulsing ether atom as from Thomson's mechanical one. Within weeks he sent a new paper off to the Cambridge Philosophical Society, whose referee reported negatively, and on 8 November he presented it to the London Mathematical Society. "It is obvious that Thomson's mechanism is only one of many which will furnish his fundamental equation, and, in choosing any one of these to represent the molecule we must be guided by the width of the range of phenomena which the individual mechanism will explain, as well as its inherent physical possibility." In the exuberance of seeming discovery he forgot his positivist irrealism, and claimed for his pulsating spheres a higher degree of physical plausibility than the atom of "springs and shells" that Thomson deployed in his Baltimore lectures. "A pulsating atom as basis of the most complex molecule seems *per se* more probable than an indivisible spring mechanism, if it is capable of giving as wide a range of results." If he sought a unified basis of physical under-

[25] Pearson, "A Certain Atomic Hypothesis" (1887), 72–73, 79–80, 111, 114; Stokes to KP, 2 April 1884, Pearson Papers 862/6; Pearson, *Grammar of Science,* 329.

[26] F. Lindemann, "Über Molekularphysik: Versuch einer einheitlichen dynamischen Behandlung der physikalischen und chemischen Kräfte," a lecture delivered 5 April 1888, in *Schriften der Physikalisch-Ökonomischen Gesellschaft zu Königsberg in Preussen,* Neunundzwanzigster Jahrgang, 1888 (Königsberg, 1889), 31–81; Hunt, *Maxwellians,* chap. 7.

standing, he did not expect or demand simplicity. He seriously doubted "that the mere translational and vibrational motions of the atoms in the ether itself are sufficient to explain all so-called chemical and physical forces." A complex molecular structure was surely required to account for the multifarious phenomena of the physical world. For the moment, Pearson was in possession of what seemed a real physical theory, and there was no need to confine himself to vague analogies or fictional models.[27]

He promised, in his conclusion, to continue with a third installment that would take up questions of elasticity and cohesion, and he duly presented a mathematical paper on elasticity and the wave theory of light to the London Mathematical Society in April 1889.[28] But it was not quite a continuation. Two weeks after reading his second paper on atoms as pulsating spheres, he experienced another revelation. He dispatched an excited note to Macaulay:

> I have just seen that nearly all the results of my atom papers still hold & the equ[ation]s are enormously simplified, if the atom be treated as an "ether squirt." Matter would thus be simply a point at which ether flows into space & mass the rate of flow. Our planetary system (unless we go perhaps to Saturn's ring) would have only positive matter, but periodic negative & positive flows would account for electricity & enforced variations in flow for cohesive & chemical forces.[29]

Working quickly, as was his habit, he soon had another paper, in which he invested great expectations. Indeed, through the summer of 1889, at least, he experienced moments of real ebullience, despite discouraging responses from reviewers. Was it ether squirts, or his hopes of a favorable reply from Maria, that account for his comments on the "suppressed feeling" of physicists that had "found vent" in the celebration of Hertz? "It is because the scientific world knows itself to be on the very verge of discoveries as to the nature of the ether, more far-reaching possibly than the discovery of the mode of gravitation, that it lives in a state of suppressed excitement, which hinders it sometimes from further progress or from recognition of the relative importance of recent work."

One might hazard a conjecture as to whose recent work had been unjustly neglected. Pearson was not impressed by Hertz's theory of electric

[27] Joseph Larmor (for the Cambridge Philosophical Society) to KP, letters from18 Sept. 1888 to 28 Jan. 1890, Pearson Papers 739; KP to Macaulay, 23 Sept. 1888; Pearson, "On a Certain Atomic Hypothesis" (his second paper under this title), *Proceedings of the London Mathematical Society,* 20 (1888–89), 38–63, on 45, 39.

[28] Pearson, "On the Generalised Equations of Elasticity, and Their Application to the Wave Theory of Light," *Proceedings of the London Mathematical Society,* 20 (1888–89), 297–350.

[29] KP to Macaulay, 23 Nov. 1888.

oscillations, probably because it bypassed the crucial question of ether mechanics (Pearson called it too narrow), and he said that the inadequacy of theory made Hertz's mathematics idle. Such views left him increasingly marginalized. As his marriage plans went into crisis, his troubles with the journals deepened too. Since he stubbornly insisted that his paper be printed in full or not at all, he was obliged in the end to consign it to the *American Journal of Mathematics,* scarcely a prestigious venue in 1891. From there it passed into one of the ether sinks in or beyond the rings of Saturn.[30]

The author of this paper presented himself less as the triumphant discoverer than as the self-protective ironist, almost an echo of the *New Werther*'s Loki. He began by quoting G. F. Fitzgerald's well-known lecture to the physicists of the British Association at Bath in 1888, a meeting animated by Hertz's electromagnetic discoveries. "It has become the fashion to indulge in quaint cosmical theories and to dilate upon them before learned societies and in learned journals." The quotation continued with Fitzgerald's confession that he had at times been "bogged in the quagmire" and so could appreciate the splendid "opportunities for piquant criticism" it furnished. Pearson added, in his own voice: "The pleasure of 'bogging oneself in this quagmire' is so great that even piquant criticism cannot restrain me from adding another quaint cosmical theory to the many that already exist." This was the theory "*that an atom or the ultimate element of ponderable matter is an ether squirt*."[31]

His idea was to reduce the atom almost to a geometrical point, and to represent it as a source or vent from which ether, a perfect fluid, flowed into space. Since the theory depended on construing the universe as a plenum, the ether being incompressible, there had to be corresponding ether sinks somewhere. Such "negative matter," however, was nowhere apparent in the vicinity of earth. He analogized the universe of ether squirts to a collection of electrodes moving freely on a perfectly smooth metal plate: they would push one another about as electricity flowed in and out from above and below. The average rate of ether flow, in Pearson's model, corresponded to gravitational mass, while characteristic variations

[30] Pearson, unsigned review of Lodge, *Modern Views of Electricity,* in *Academy,* 36 (1889), 322–324; Larmor to KP, 28 Jan. 1890, Pearson Papers 739. On Hertz, KP to Oliver Lodge, 18 July 1894, in Lodge Papers, MS Add 89/81. Later, however, in *Nature,* 54 (17 Sept. 1896), 461, Pearson argued that statistics could do for evolution what Hertz did for Maxwell. The ether squirt hypothesis was picked up by at least one scientist, W. H. Julius in the Netherlands; see Smith and Wise, *Energy and Empire,* 489.

[31] Pearson, "Ether Squirts," *American Journal of Mathematics,* 13, no. 4 (July 1891), 309–362, on 310. Even Thomson's "horrible" spring-mattress atoms, he told Lodge, have at least the virtue that molecular action becomes complicated rather than a mere summing of inverse-square forces between pairs of atoms: KP to Lodge, 18 Nov. l889, Lodge Papers MS Add 89/81.

or vibrations in the rate of flow accounted for emission and absorption of light. He went on to derive chemical affinities and to show that some of the most important interactions, including cohesion, involved the vaguely anthropological notion of "kin-atoms," resonating harmoniously. The basic mathematical laws of nature, such as the inverse-square law of gravitation, became, in Pearson's theory, mere approximations of intricate interactions of the ether squirts, a complex hydrodynamics.

These efforts to understand forces in terms of continuum mechanics followed the broad lines of William Thomson's work. In an ether field, even two-atom interactions could never be simple. Wrote Pearson: "The introduction of a third atom into a field containing two others not only introduces new forces between these two atoms, but profoundly modifies the force existing between the two first atoms." Complexity was no basis for rejection, however, since any good physical theory must offer some account of the "nigh infinite range of chemical and physical properties in each individual substance." The ether squirt was structurally simple yet capable of generating great variety. Pearson envisioned that every substance of known atomic structure might require a special mathematical dissertation.[32]

The mathematical pliability of his model, if such it was, came at some cost in the currency of physical plausibility. He acknowledged this immediately, adding only that many of his contemporary etherealists had already made an equal or still greater sacrifice. The inadequacies of Thomson's vortex atom had, as Pearson pointed out, driven him to organize his Baltimore lectures around mechanical molecules—shells and springs. These models, whatever their value for the mathematical treatment of light, electricity, and magnetism, had grave defects in regard to chemical phenomena. Worse, from Pearson's standpoint here, was the inelegance of the ontology, which even Thomson regarded as a helpful model and not as reality. Since the mechanical molecules could in no way be derived as properties of a fluid ether, Pearson argued, they raised "the not unnatural repugnance of the philosophical mind to a dualistic theory of the universe." His theory was monistic, a representation that reduced atoms and molecules to ether, and matter to motion, and in which there was no action at a distance.

But was the world really like this? He did not defend his rather strange physical picture, but invoked the sufficiency of sensory perceptions and the mathematical fertility of his model to justify it. "It is, some may think, unlikely that the molecule is really a group of ether squirts, but the molecule is a dynamical system, and any model of a molecule which does not contradict obvious physical facts, but goes a long way to explain those facts, cannot but be suggestive as to the nature of the laws governing real

[32] Pearson, "Ether Squirts," 361, 321, 339.

molecular systems." The real structure of nature must remain unknowable in any case: "But we do not know why it [the ether] flows, much less the reason why only a limited variation is permissible in its rate of flow. That depends on the state of affairs outside the space, which is alone sensible to us and with which we can deal. We can, as it were, only guess at the 'potential energy' of our atom, which lies outside our space. On the ether squirt hypothesis, the mechanism of the *Ding-an-sich* is beyond our control or inspection."[33]

Pearson's radical rejection of metaphysics, his denial that we can ever know the nature of things, now signified no abandonment of ether models, but a defense. He praised Thomson's vortex atom as "an extremely beautiful hypotheses," objecting only to its ponderous corporeality. He thought Thomson retrograde for ascribing gravitational mass to the ether, rather than deriving the properties of mass from pure motion. In 1891, when G. Udny Yule asked whether Pearson's own ether structures weren't mechanical, he replied that mechanical explanation meant setting out from ordinary ideas of force and mass. The ether squirt or wrinkle in space represented the first stage in tracing such mechanism back to geometry. The older ideas, by contrast, gave support to materialist and even spiritualist ideas. He complained to Lodge: "It is the use of words without proper signification which is the sin against the Holy Ghost today!"[34]

Temptation, Renunciation, Positivism

It might, from this standpoint, be impossible to speak scientifically of things in themselves, but Pearson was not compelled to be silent. In his paper he indulged the speculation that the ether squirt "may be an argument for the existence of a space of higher dimensions than our own, but of that we can know nothing." Perhaps the ether flows into our space out of an invisible fourth dimension. This thought crossed his mind almost at the moment of discovery and drew him with the allure of the taboo. The ether squirt, he told Macaulay, "offers a beautiful chance to four-dimensional space men & theologians as the ether must be squirted from somewhere." In his *Grammar of Science* he graciously offered some crumbs to his more

[33] Ibid., 362, 317.

[34] G. Udny Yule to KP, 6 March 1891, and KP to Yule, 20 April 1891, Pearson Papers 905 and 931. KP to Oliver Lodge, Lodge papers MS Add 89/81. On Thomson's vortex atom, see Smith and Wise, *Energy and Empire,* 419–424. In KP to Parker, 6 April 1885, he remarked that Thomson (in his *Baltimore Lectures*) "has been writing about the weight of the ether, as if empty space could weigh anything!—I am going to weigh a twist!—That might mean something."

speculative readers. Invoking Edwin Abbot's tale of *Flatland* to evoke what an invisible added dimension might mean, he announced its special relevance "for those minds which, strive as they will, cannot wholly repress their metaphysical tendencies, which *must* project their conceptions into realities beyond perception." The ether squirt might provide a cosmic loophole, a passage into what these metaphysicians would *dogmatically* call the supersensuous: "Out from our space through the ether-squirt, out through matter we in conception pass, like the flounder, to another dimensioned space. . . . Here in this new playroom, entered, perhaps, by the doorway of matter, metaphysician and theologian can for the present safely spin beyond the sensible the cobwebs, which have been swept away by the scientific broom whenever they encumbered the habitable apartments of knowledge."[35]

Who might these irrepressible metaphysicians and theologians be? He liked to complain of such persons in general, but the idea of the atom or ether as a gateway into a higher reality had a very particular source. This was Charles Howard Hinton, a Balliol man and author of some works uniting pedagogy and allegory about the fourth dimension. Hinton's prosecution for bigamy in October 1886, mentioned in the last chapter, gave Pearson new grounds to condemn the radical sexual doctrines of Howard's father James Hinton, who still had some admirers within the Men and Women's Club. The son had, under the name of John Weldon, recently married one Maude Florence in order to legitimize the twins she bore him. His proper wife, Mary, daughter of George Boole and mother already of three more Hinton children, did not wish to prosecute him, even though he confessed to continued relations of an "intimate character" with Maude.[36]

Pearson loathed the man, or at least his deeds, and never cited him, yet he was always well-informed about scientific work, and there is evidence that Hinton's *Scientific Romances* were known in his circles. In the immediate aftermath of the trial, Olive Schreiner corresponded with Maria Sharpe about the fascination of four-dimensional space. Was Hinton working out a geometry of bigamy? Using, as Pearson would also, the severely constricted perspective of idealized flounders and other two-dimensional beings to illustrate what inhabitants of three dimensions might be missing, he explained how one of these flatlanders, confined by a square, could escape by rising into the third dimension. So also, a four-dimensional being in three-dimensional space "would come and go at pleasure; he would be

[35] Pearson, "Ether Squirts," 313; KP to Macaulay, 23 Nov. 1888; Pearson, *Grammar of Science*, 322.

[36] See reports on the trial in *The Times* (London), 15 Oct. 1886, 3e, and 16 Oct. 1886, 4c.

able to perform feats of the most surprising kind." He might travel to a different three-dimensional space, otherwise isolated from our familiar one. His "state of being" would involve powers "far transcending our own."[37]

Among the compelling reasons for belief in the fourth dimension was the illusion, as Hinton thought, of nonidentity implied by mirror-image symmetry. The stubborn difference of object and reflected image, as of the directional markers left and right, must be merely a matter of perspective. In a fourth dimension, however, the reflection could be pulled through itself and reversed. To recognize this is to elude the constraints of three-dimensional thought. Hinton called it "Casting Out the Self" because it got beyond the limitations of the human senses. It was one example of the release that could be attained through the recognition of higher dimensionality.[38]

Hinton supposed that the fourth dimension was very thin, a mere bubble of ether. For it to be infinitely thin, or nonexistent, would require an absolute precision that is never found in the world, but only in the abstractions of geometry. Since it was minute, it could most promisingly be sought out at the level of atoms and molecules. "We conceive," he explained, "that from every particle of matter there is a new direction not connected with any of those which we know, but . . . at right angles to them all." As with Pearson's ether squirts, every atom in Hinton's space opened up into a new dimension, a world of enhanced possibility for the man who could conceive it. "From all shapes would fall that limitation of thought which makes us see them differently to what they are; and in largeness and liberty of possible movement his mind would travel where ours but creeps, and soar where ours journeys and diverges." Four-dimensional existence would give "a sense of largeness and liberty penetrating even through the profoundness of our ignorance."[39]

Hinton was preeminent among the metaphysicians derided by Pearson, men longing to slip out of this world of shadows and to project their fan-

[37] Olive Schreiner to Maria Sharpe, 24 Nov. 1877, Pearson Papers 840/5; C. H. Hinton, "What Is the Fourth Dimension?" *University Magazine,* 96 (1880), 15–34, on 33, 16. In the reprinted version in Hinton's *Scientific Romances* (London: Swan Sonnenschein, Lowrey, 1886), 3–32, he argued that a three-dimensional being in four-dimensional space has a merely abstract mathematical existence, just as a two-dimensional plane has for us, and defended a philosophical idealism based on Spinoza. On his trial for bigamy, see Brandon, *New Women and Old Men,* 62–63, and Pearson Papers 10/61/7; on his career, but with the sexual conflicts omitted, see Rudolf B. Rucker, introduction to Hinton, *Speculations on the Fourth Dimension,* ed. Rucker (New York: Dover, 1980).

[38] Hinton, in "Casting Out the Self," *Scientific Romances,* 205–229.

[39] Hinton, "A Picture of Our Universe," in ibid., 161–204, on 194. On Hinton's work and significance, see Henderson, *Fourth Dimension,* esp. chap. 1; on his allegories as predecessor to science fiction, see Clarke, *Energy Forms,* 111–121. The copy I used of *Scientific Romances,* held in the UCLA libraries, was owned originally by H. G. Wells. The text is unmarked.

tasies into another dimension of the cosmos. There was, however, another such being, still closer to home. The mocker or *Spötter* who castigated such speculations was far from immune to the attractions of a higher physics, even if he thought them unsuitable for the common herd. He was, to be sure, grateful that the mathematical demands of the fourth dimension would disallow "lighthearted expeditions," as by that "young gentleman from Balliol who assumed the higher mathematics in order to pass at once to their applications to supernatural religion." Yet he held out the prospect that, through the efforts of mathematicians, this speculative conception of an ethereal atom in four dimensions might some day become a "*perceptual* fact." This explorer was sometimes vexed, as he had explained to Maria Sharpe in his excitement after reading the Lindemann paper, that "the puzzle should last so long—if only the giants could strike a little bit harder & let a little more light in! But it must come soon and then we shall be able to appreciate and understand so much more of the world, or of our sensations of it, whichever may be the right term. That is the great advantage of being at last one of the initiated—of the small joys of science—one can hug oneself with joy and say: 'It can't be long now, and when it does come *you* will understand it!'"

It seems that Pearson, more than a decade after the fictional suicide of "Ralph Hewitt," still longed to escape the confined space of this terrestrial orb, where so much is concealed, and through recondite investigations to gain privileged access to a higher reality. The despised Howard Hinton, whose "scientific romances" were published the same year as his bigamy trial took place, in 1886, was not yet forgotten on the occasion of Pearson's discovery, two years later, of the ether squirt. The thrilling sense of dimensional release was evidently something the two men shared. My more speculative readers may be stimulated by this circumstance to imagine a somewhat diffuse element of eroticism in Pearson's ethereal fantasies. Or the holistic complications of the three-atom problem might seem to recall the tangled relations at just the same time of himself, his intended, and her friend Lina Eckenstein. "But we have romanced enough for the sake of the metaphysically-minded," we are enjoined by the *Grammar of Science*. "Returning to the solid ground of fact. . . ."[40]

Pearson had been fascinated by the possibility of geometrical explanations of physical phenomena, involving the curvature of a higher-dimensional space, since at least 1884, when he undertook to complete *Common Sense of the Exact Sciences*. Clifford, following the German mathematician Bernhard Riemann, had explored such possibilities in other writings, and Pearson drew from them to write the remaining sections of this posthumous

[40] Pearson, "Some Books on Electricity," *Academy*, 37 (1889), 208; KP to MS, 23 Aug. 1888; *Grammar of Science*, 322–323.

volume. He also tried out here some arguments of his subsequent *Grammar of Science,* including the flounder that resides in two dimensions and cannot even picture a third. He explored the experience of limited dimensionality in a more encompassing space through the image of a worm confined to a perfectly circular tube, imagined first by Clifford. Since the curvature was uniform, the worm would not know to associate it with the external world rather than its own internal state. Its belief in the Euclidean "sameness" of all space, Pearson argued, would be better justified than ours, since it would have visited every part of its one-dimensional world. The limits of the worm's knowledge were in some ways analogous to our own. Such illustrations reveal once more that Pearson's arguments against such concepts as "matter" and "force"—his effort "to reduce, in fact, all dynamic to kinematic," a pure science of motion—were not merely a positivistic effort to purge science of metaphysics. He was seeking a new way of framing the laws of physics, something more geometrical and less materialistic. "The hypothesis that space is not homaloidal [flat or uncurved], and again, that its geometrical character may change with time, may or may not be destined to play a great part in the physics of the future."[41]

These arguments for the geometrical constitution of reality, in turn, point back to his idealist metaphysics, the obverse of his enduring skepticism about knowledge of an external world. Back in 1879, in his report to Parker from Heidelberg of his ecstatic moments of harmony with nature and of his wish to recover the world of Greek "maidens and youths running naked together," he had also argued that each mind constructs its own universe.[42] From the beginning he was thinking in radical Kantian terms, of the ego imposing its categories of thought on an indefinite or illusory world. Space was for Kant, and for Pearson, paradigmatic. It was not a characteristic of the world, but a necessary frame for us in order to conceive the world, and thus a property of mind rather than of external reality. In his first lecture at the South Place Institute in 1883, he came forward as a full-blown idealist in the Fichtean mould. He marveled there at the capacity of mathematics, a pure creation of mind, to determine how the planets must behave, far out in space. In the end, though, he concluded that there was no miracle, since the invariable order of nature followed necessarily from the orderliness of thought. A chaotic world was impossible "for the very simple reason that no man can conceive it." Events in the world must appear to us in the only way thought can think

[41] Clifford, *Common Sense of Exact Sciences,* preface and 203. Everything discussed in this paragraph is from the sections written by Pearson. On these non-Euclidean geometries, see Richards, *Mathematical Visions,* esp. 109–113. Pearson repeated these arguments in the *Grammar of Science.*

[42] KP to Parker, 28 July 1879.

them, and thus the presumed properties of that world are in fact given wholly by mind. In this sense, the curves, surfaces, and correlations of Pearson's descriptionist science implied not simply a denial that the mind has access to any exterior reality, but entailed also a visionary claim for geometry as the deepest reality of all.

Pearson's antimetaphysics was never hostile in principle to reliance on entities outside the bounds of sense. Indeed, he had already in 1883 offered, as an exemplary instance of a suitable explanatory concept, the pulsating atom in a fluid medium, embodying his own grand ambition to revolutionize physics. By its fruits it might be validated, and it had already been shown to imply "something very akin to the so-called law of gravitation." But if our concepts allow us to predict or determine the phenomena of nature, it follows that the universe must be "one vast intellectual process. . . . *It is the mind of man which rules the universe.*"[43] What Balliol man could beat that?

Pearson's scheme exposed materialism as baseless and misguided, a needless provocation to traditionalists that distracted science from its proper field. Any reasoning from creation to a Creator, however, was equally illogical, since the universe as we know it was constructed by the human mind. Pearson thus rejected, with one and the same argument, matter and God. This did not quite squeeze out all possibility of religion. Instead, it diffused divinity throughout nature—that is, through all human perceptions. As he explained to the Sunday Lecture Society in December 1885, faith in science would allow us to return to a single religion, a Church universal, because "one Reason existeth in all men." His ostensible positivism appears here in a different light, as an aspect of the resolution of his youthful religious crisis, in which the rejection of things in themselves merely overlaid his anticipation that science was about to overcome the old Cartesian dualism. We must, he argued, be content (for now?) with descriptions of phenomena, but were they merely phenomena? If it was impossible to know the causes acting in nature, this was because causes act rather in the world of mind. Whoever can answer the question of *why* "will have probably discovered the relation between matter and mind."[44]

He did not quite abandon that quest, to comprehend the connection of matter and mind, for several more years, if ever. His spirited "metaphysical" discussions with J. J. Thomson point to a desire to get at the nature of things, as do the various expressions of his continuing frustration with surface and sham. It may be significant that his last work of German religious

[43] Pearson, "The Ethic of Freethought" (1883), in *Ethic of Freethought,* 27–28, 31.

[44] Pearson, "The Prostitution of Science" (1888), in *Ethic of Freethought,* 36; "The Philosophy of Natural Science," *Nature,* 55 (5 Nov. 1896), 1–4, on 4; "Matter and Soul" (1885), in *Ethic of Freethought,* 56, 76, 57.

history, carried out in honor of the deceased Henry Bradshaw, was a study of medieval images of Veronica. According to legend, she offered Jesus her veil to wipe his face as he carried the cross to Golgotha, then found his image miraculously imprinted on it. Pearson quoted from a late fifteenth century passion play Veronica's plea to Christ as she offered him her veil:

> O Jhesus liebster herre min,
> muss ich von dir gescheiden sin,
> so bit ich dich doch umb ein gab,
> da mit ich din gedechtniss hab,
> die bildung von diner angesicht,
> das ich din herre vergesse nicht.

(Oh Jesus my dearest lord, if I must be separated from you, then I ask you for a gift, so I will have a remembrance of you, the image of your face, that I forget not your lordship).[45] A likeness was no substitute for the real thing but offered comfort at a sad time of separation and death. Could purely descriptive knowledge provide consolation if nature was to remain forever beyond the range of the senses? Or was the scientist, unable to acquire even simulacra of nature, irredeemably alienated from it?

The Universe as Mental Construct

In 1891, after a probationary lecture in January, Pearson was selected as Gresham Professor of Geometry. The position, which entailed giving a series of lectures at Gresham College in the City of London, offered a useful supplement to the income of the now-married mathematician and an opportunity to air his views on scientific questions of broad significance before a general audience. The first year he spoke on "The Scope and Concepts of Modern Science" in two series, each consisting of four consecutive lectures, during the first week in March and then the first week in April, at 6:00 in the evening. In these few months he sketched out the argument for eight of the ten chapters of *The Grammar of Science*. Another nine months of spare-time work sufficed for him to complete it. He had long been meditating on these questions.[46]

"There are periods in the growth of science when it is well to turn our attention from its imposing superstructure to carefully examine its foun-

[45] Karl Pearson, *Die Fronica,* 17.

[46] See the advance notes for these lectures in Pearson Papers 48. Probably he failed to give the fourth lecture, on the classification of the sciences, in March, since the syllabus for it was repeated in the notes for April.

dations." He did not question the "great results" of science, at least not of physics, but their illogical expression could easily lead astray the newer sciences of life and mind, and indeed had confused his fellow physicists who ventured into other domains. He regarded their susceptibility to natural theology and to spiritualism as of a piece with their naïve scientific materialism, and equally misguided. Materialism, in the strict sense, was in fact uncommon among the British physicists whose supposed confusion had provoked his philosophical housecleaning. Although Thomson, Maxwell, and their followers (including Pearson, at least in his physical writings) earnestly sought an adequate ether theory, they made increasing use of "models" that they readily acknowledged as fictions. Thomson and Peter Guthrie Tait's standard Victorian treatise of natural philosophy was too mechanical for Pearson's taste, assigning the ether many properties of ordinary matter rather than deriving them from motion or from the geometry of space. Tait in particular was a thorn in his flesh, and Pearson condemned him for treating matter as "the plaything of force." Such ideas, Pearson thought, gave an "uncanny & spiritualistic aspect to the phenomena of the universe."[47]

British antimaterialism developed into an increasingly positivistic approach to ether physics toward the end of the century. "A model of the ether," wrote Fitzgerald in 1888, can support mathematical analogies that represent the laws of a physical object, but they may be wholly unlike that object. "To suppose that the ether is at all *like* the model I am about to describe" would be like confusing a sphere with its formula, and then claiming that in consequence it must be like the paper and ink. It seemed increasingly that causal relationships in ether physics could only be asserted. After all, there were no structures of reality more basic than the ether from which they could be derived. Or even the ether might in its turn give way to something at bottom massless, as the seeming materiality of the world was reinterpreted as a mere consequence of motion.[48] This causeless physics, with its proliferation of models in place of causal accounts, could be interpreted as authorizing a religious dimension in the science of the ether. "The hypothesis that the ether is like a thin jelly in no

[47] Pearson, *Grammar of Science,* vii and 140–142; untitled, undated Pearson ms., Pearson Papers 104. He bore a particular animus against Tait for his review of *Common Sense of the Exact Sciences* (see chap. 3, note 43, above). He sent this review with marginalia ("This is what I expect from P. G. T.") to Lucy Clifford; see Pearson Papers 661.

[48] G. F. Fitzgerald, "Foundations of Physical Theories: Function of Models" (written no later than 1888 but unpublished until 1902); and "Address to the Mathematical and Physical Section of the British Association" (1888) in Joseph Larmor, ed., *The Scientific Writings of the late George Francis Fitzgerald* (Dublin: Hodges, Figgis; also London: Longmans, Green, 1902), 169, 239.

way *explains* this property," wrote Fitzgerald, referring to its capacity to bear electromagnetic waves, "as it is the possession of properties analogous to rigidity that requires explanation." He later proposed to account for these phenomena as thoughts of God, after the fashion of his countryman George Berkeley.[49]

Pearson would have none of that. Keeping clear of theistic religion, he interpreted natural phenomena instead as the thoughts of man. Lenin, who dismissed positivism as reactionary, commended Pearson for his consistency, revealing the pure idealism that underlay this form of thinking. He was, in a way, right, but Pearson's philosophy was scarcely a prop for the old theocratic order. The *Grammar of Science* was rather continuous with the humanist religion of Pearson's passion play: "Oh men! The god in him ye crucify! / Your sons the man in him shall deify."[50] Antimaterialism was, for Pearson, a reason to dismiss God as a purely superfluous concept, begotten through the alienation of man from the elements of his own divinity. "As [man] projects his sense-impressions outside himself, and forgets that they are essentially conditioned by his own perceptive faculty, so he unconsciously severs himself from the products of his own reason, projects them into the phenomena, only to refind them again and wonder what reason put them there." There is reason in the laws of science, but the so-called reason of nature is purely anthropomorphic. Men may find reason in the universe, but a dog would, with equal legitimacy, find instinct. "Our wonder ought not to be excited by the idea that so vast a range of phenomena are ruled (*sic!*) by so simple a law as that of gravitation, but we ought to express our astonishment that the human mind is able to express by so simple a description such wide sequences of sense-impressions."[51]

The *sic!* in Pearson's sentence declared his skepticism of any imputation of causality to the external world. Newton's universal gravitation, like Kepler's ellipses, offered nothing more than description, albeit of greater generality. In arguing this way, Pearson was simultaneously calling attention to the limits in principle of any assertion of natural law and registering his expectation that Newton's law would soon be shown, on the basis of a still more general ether theory, to be valid only as an approximation. Among other things, Pearson defended his philosophical position as "helping to clear away the jungle of metaphysical notions which impedes the progress of physical science." He was working toward a revolutionary

[49] G. F. Fitzgerald, "On a Model Illustrating Some Properties of the Ether" (1885), in Larmor, ed., *Scientific Writings,* 154; on Berkeley, see his "Helmholtz Memorial Lecture" (1896) in ibid., 376; both cited in Hunt, *Maxwellians,* 97–99.

[50] Pearson, *The Trinity,* 201.

[51] Lenin, *Materialism and Empirio-Criticism,* 45 (see chap. 1, n. 7, above); Pearson, *Grammar of Science,* 109–111.

transformation of physics, which indeed his writing helped to advance, though not quite the one he was looking for.[52]

Like Mach, whom he did follow on a few points, Pearson held up "economy of thought" as the ultimate touchstone of science. The phrase pointed at a Darwinian function for science—to enhance human efficiency. Mach wielded his principle in opposition to atomism and the whole "mechanical conception of physics," which, he thought, set up an unfortunate dualism of matter and thought, physics and psychology, when all of experience attests to their unity.[53] He declared without further argument that mechanical reductions can never provide a true economy, but merely substitute for known facts "an equally large number of hypotheses." Pearson opposed him on this point, defending the value of nonsensory and even mechanical conceptions as strategies for describing phenomena with greater economy and generality. That is, Pearson was more indulgent of models of the invisible, submicroscopic world than was Mach, and he did not deploy his philosophy to reject in principle, or at all, such conceptions as the molecule or the gene. Rather, he offered a luxuriance of hypothetical entities, beginning with the ether as the most fundamental of all. Out of it he assembled a hierarchy of building blocks, including the physicist's "prime atom" or "protyle" that he, following William Crookes, regarded as more fundamental than the chemical atom.[54]

Probably no positivist has ever been altogether steadfast in applying the principle of economy. Pearson's translations of physical and biological assertions into mentalistic language sometimes made them almost ludicrously cumbersome rather than spare and economical. Thus on the ground that "a year now" may not "represent the same amount of consciousness as it did a few million years back," Pearson disallowed the assertion that "such and such changes occurred 'between one and two hundred million years ago.' What we really mean is this: that in order to resume and classify our perceptual experience of the earth, we form a

[52] Pearson, *Grammar of Science*, 118, 386.

[53] Ernst Mach, "The Economical Nature of Physical Inquiry" (1882), in *Popular Scientific Lectures,* 3d ed. of English trans. by Thomas J. McCormack (La Salle, IL: Open Court, reprinted 1986), 186–213; Mach, *History and Root of the Principle of the Conservation of Energy* (1872), trans. Philip E. B. Jourdain (Chicago: Open Court, 1911), 49; Mach, *The Analysis of Sensations* (1886), trans. of 5th German ed. (1906) by S. M. Williams, rev. by Sidney Waterlow (New York: Dover, 1959), 30. On Mach's career and philosophy see Blackmore, *Ernst Mach.* I develop the argument of this paragraph more fully in Porter, "Death of the Object."

[54] Ernst Mach, *The Science of Mechanics* (1883), 6th ed. of English trans. by Thomas J. McCormack (La Salle, IL: Open Court, 1960), 599; Pearson, *Grammar of Science*, 115, 333. By 1890, the doctrine of protyles rested mainly on spectroscopic evidence; see Brock, *From Protyle to Proton*.

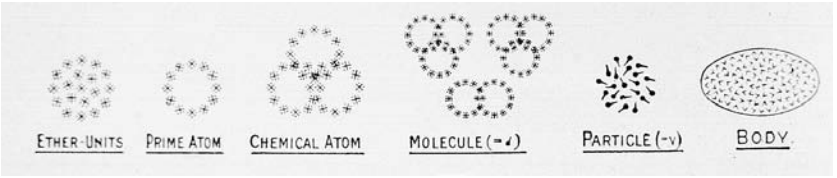

Figure 11. The hierarchy of matter, in *The Grammar of Science* (all editions; this figure from second edition).

conceptual model of it, and such a model we conceive to have passed through certain changes one or two hundred million years ago in *absolute time*." Often the grammarian's perspective simply incorporated a language of distancing from physical reality, a philosophical idealism, without adding information. The point was to avoid projecting our "conceptions" into the world of "perceptual experience."[55]

Perceptions and conceptions were, for Pearson, the basic elements of science. Perceptions, given by experience, provided raw material to human reason and formed the basis for all legitimate conceptions. Conceptions, achieved through the progress of science, were purely mental and could be radically historicized. Scientific law, he argued, does not exist before man gives expression to it, and, for example, Newton's inverse-square formula "was not so much the discovery as the *creation* of the law of gravitation." He explicated this claim by invoking the necessary "creative power of the intellect," Newton's intellect, to identify and conceptualize such regularities. He went on, however, to argue still more radically that perceptions, too, were constituted mentally. Science "is in reality a classification and analysis of the contents of the mind."[56] This idealism, descended from the doctrines of a youthful Fichtean Schwärmer, was not easily reconciled to Pearson's aggressive scientism of 1892. But his declaration of freedom from oppressive materialist reductions implied also the refutation of all faith in a rational order of the cosmos, or natural theology. A proper deification of the human mind would leave no room for an antique God.

Modern technology offered promising analogies for the determination of the world by mind. The mind may accept "only particular classes of sense-impressions—being like automatic sweetmeat boxes which if well constructed refuse to act for any coin but a penny—and having received their material they arrange and analyze it, provided they are in working order, in practically the same manner." "We are all familiar," proclaimed *Chambers's*

[55] Pearson, *Grammar of Science,* 226, 417, 311–312; Porter, "Death of the Object," 140.
[56] Pearson, *Grammar of Science,* 98, 104, 63.

Journal the same year, with the bewildering development of automatic machines in railway stations and other public places, "which, if set agoing by the deposit of the essential coin, will show your height or weight, test your pulling strength, give you an electric shock, tell your fortune, or supply you on demand with a box of matches, packets of chocolate, confectionery, cigarettes, cigars, sheets of note paper, postcards, postage stamps, or other articles of more or less utility." Pearson supposed that the perceptive faculty may similarly have been molded to register only certain kinds of sense impressions. Like a sorting machine for stones—he proposed in a related metaphor—it rejects some and sorts the rest, ordering them on grids of its own construction, such as space and time.[57]

Form and matter were at odds in this analogy, which likened the mind to a machine so as to explain why the order of the universe must be mental and not mechanical. And there were other incongruities, arising from the new demands he placed on scientific method. He now identified science as a system for achieving consensus, which might not be expected if the phenomena of nature are produced separately by each individual mind. Pearson got over this obstacle by deriving uniformity from the presumption of "normal" human faculties. These would be embodied in organic structures of brain, which would be driven to normality through the evolutionary process. Natural selection must be very hard, he thought, on those who cannot establish routines of perception and of action. In modern times, such deviants would be the incompetents and criminals, whom society increasingly recognizes as insane.[58] Thus the pure idealism of his metaphysics was made to rest on brain physiology and natural history, themselves having no real existence except in the minds that conceive them. Mental necessity was rooted in laws of biology.

In practice, this supposedly ineluctable evolutionary tendency to normal perception was not self-sufficient, since superstition remained rife in the world. In practice, it required to be bolstered by scientific preaching, that is, by Pearson's own *Grammar*. "The abnormal perceptive faculty, whether that of the madman or that of the mystic, must ever be a danger to human society, for it undermines the efficiency of the reason as a guide to conduct. Conviction, therefore, of the uniform order of phenomena is essential to social welfare." He called for a kind of renunciation in the face of the dangers of emotionality. "Every ecstatic and mystical state weakens the whole intellectual character of those who experience it, for it impairs their belief in the normal routine of perceptions." Those who know Pearson only from

[57] Ibid., 121–128, 220; Anon., "A Penny in the Slot," *Chambers's Journal of Popular Literature, Science, and Arts,* 9 (30 July 1892), 486–487.

[58] Pearson, *Grammar of Science,* 57, 121, 151, 164–165, 195.

his publications cannot appreciate how fully he knew whereof he spoke. One of the principal claims of science was to reduce the power of "blind emotional excitement."[59] Science longed, with Spinoza, to be purely intellectual being, free of emotion and desire.

The Alienated Mind

Pearson was no admirer of paradoxical philosophy, yet the *Grammar of Science* was founded on paradox. Nature, whose characteristics were strictly created by the human mind, was yet inaccessible to mind. Even the phenomenal world, the world of perceptions, could not be comprehended spontaneously but required to be framed and classified by scientific method. In the deepest sense, by this logic, reliable knowledge was an act of self-overcoming. The progress of science presupposed that mind, and with it the world, must be historical. Pearson looked with patient anticipation to the prospect that some of his mental inferences might be made real. In particular, the "happy conception" of the ether squirt, with its four-dimensioned space, might someday be "discovered to be a *perceptual* fact." Unfortunately, since that moment had not yet arrived, a certain disquiet was part of man's lot. "[W]hen we project the ether into the phenomenal world, it is at once recognized as a conceptual limit unparalleled in perceptual experience, and we do not feel at home with it."[60]

Formulations of this kind suggest that, even as a mature scientist, he was not quite free of what he was pleased to regard as Hegelian cobwebs. The Pearsonian mind spins out a world, but finds it is not at home with the concepts it has created. It hopes that the further working out of knowledge, following scientific method, might lead to a more tangible, perceptual familiarity with these conceptions. The ether, with all its vagueness, was an ill-explored continent, a challenge to the imperial scientist, which some Galileo or Newton of the future might someday "annex" through clearer definitions. But then they would be off on new adventures, on the track of some other quarry that might forever elude them. And whatever the prospects for science in the future, it was obliged for the moment to reject what vain metaphysics longs for, a world fashioned out of matter, ether, or will. The scientist does not project "behind sense-impression, if indeed there can 'be' anything." Science, allowing no rest and only the most provisional contentment, meant struggle unceasing, along a stony path with no shortcuts and no proper destination. Pearson explicitly rejected every prospect of a final theory.[61]

[59] Ibid., 165, 11.
[60] Ibid., 323–324.
[61] Ibid., 386, 215, 22.

The rapturous merger of self with world that might end this striving was also prohibited by his formulation of scientific method. The world created by mind was yet inaccessible to mind, and even the abundant data of perceptual experience could not lead the observer any closer to reality. He offered another technological metaphor to illustrate the relation of mind to world. A brain is like the central office of a telephone exchange, connected by wires (sensory and motor nerves) to its many subscribers. If customer A, wishing only to talk to W, arranged for their wires to be joined, the transmission of their messages independently of consciousness would correspond to a reflex action. Or if B invariably corresponded with X, the clerk could make the connection strictly by habit whenever B rang. In other cases, his originality would reduce to following the instructions of the subscribers. Our knowledge of nature is like what the clerk knows of the world, supposing him "*never to have been outside the telephone exchange, never to have seen a customer or any one like a customer—in short, never, except through the telephone wire, to have come in contact with the outside universe*." We are, like him, confined to a windowless office, receiving and processing messages with no unmediated knowledge of the "things in themselves" from which they may arise. That we have other senses—touch and sight as well as hearing—merely signifies that we can use one wire to gain information about a second. For science, and for us, reality is just these sense impressions. "We are cribbed and confined in this world of sense-impressions like the exchange clerk in this world of sounds, and not a step beyond can we get."[62]

A shrewd reviewer for the *Agnostic Journal* interpreted these words as a counsel of despair. Pearson seemed to yearn for some mystical gnosis. The reviewer paraphrased: "Now we see as through a glass darkly; but then we shall see face to face." The senses, he thought, were for Pearson a kind of prison, getting in the way of unmediated experience. "Could the unfortunate *ego* only find its way out through the cranium, and, perched on a hair, survey the world face to face as it really is, and not as it merely appears when distorted by optic, auditory, olfactory, and other nerve bundles, what a look of surprise and ineffable wonder would light up the face of the liberated and delighted *ego*."[63]

Although the regret ascribed by this review was real, Pearson also drew positive, reassuring conclusions from the inaccessibility of external nature. His philosophy allowed no "crude metaphysical materialism," no "mechanical determinism" of nature. While he certainly did not advocate any traditional religious doctrines of free will, he refused to make the self a plaything of external forces. Rather, our education, experience, inheritance,

[62] Ibid., 53–55, 74–76; italics in original.

[63] J. H. Beatty, "The Ego and the External World," *The Agnostic Journal,* 27 Aug. 1892, 139–141, on 140.

physique, and disease, associated with class, race, and other great forces of evolution, produce in each person a distinctive character. In his analogy of the mind as telephone clerk, he explained human freedom as the possibility of actions that draw from memory and from the experiences that mould character, rather than being determined by the sense impressions of the moment. Individuality, then, functioned as an intermediate link in the chain of causation. None of this followed with rigorous logic from his idealist epistemology, but it was consistent in tone and feeling with his antimaterialist principles.[64]

He was very much concerned to preserve an element of human dignity. In a system that understood laws of nature as the outcome of scientific ingenuity working on the products of normal human perception, the human mind was necessarily active and creative. Facts and laws were created by the mind and never forced on it. Science, in Pearson's formulation, depended crucially on human imagination, which for him, as for Huxley, betokened a connection to the creativity of art and literature. Yet he insisted on a degree of austerity, "disciplined imagination." "I suppose when one has finally become the good citizen, you could not object to a little riotous & childlike use of the imagination for its own sake," countered Joseph Larmor.[65]

Pearson's philosophy even provided, in certain contexts, a basis for conceiving the mind as comfortable in the world. We are not lost in an infinity of space, which reduces our petty selves to cosmic insignificance. Since the most distant star is no less sense impression than a page of this book, it is "hopelessly misleading" to suppose "that the vastness of space contains more than our finite capacity can imagine." He developed this point in explicitly psychological terms in one of the few unmistakably Machian passages from the *Grammar.* He reproduced there Mach's drawing of the field of vision of the professor lying on his couch with one eye closed. Moustache, nose, and eye socket frame the image, giving way to waistcoat, shoes, arm rests, floor, walls, and windows. It was all made up of sense impressions, and the point at which self leaves off and outside world begins appeared as a matter of convenience and not of truth. The very existence of self was warranted by nothing more than a continuity of sensations, a continuity that did not persist over indefinite time. Pearson's self was recognizable by certain features and functions, as is a blackboard, but the blackboard might subsequently be pulled apart by a carpenter and reconstructed as a four-legged table, its surface now coated with a thick red layer of Aspinall's enamel. So also, the mind and body of a boy are so thor-

[64] Pearson, *Grammar of Science,* 368, 278, 150.

[65] Ibid., 37–38, 41–43; White, *Thomas Huxley,* chap. 3; Joseph Larmor to KP, 1 March 1891, Pearson Papers 739, responding to the syllabus for Pearson's Gresham lectures.

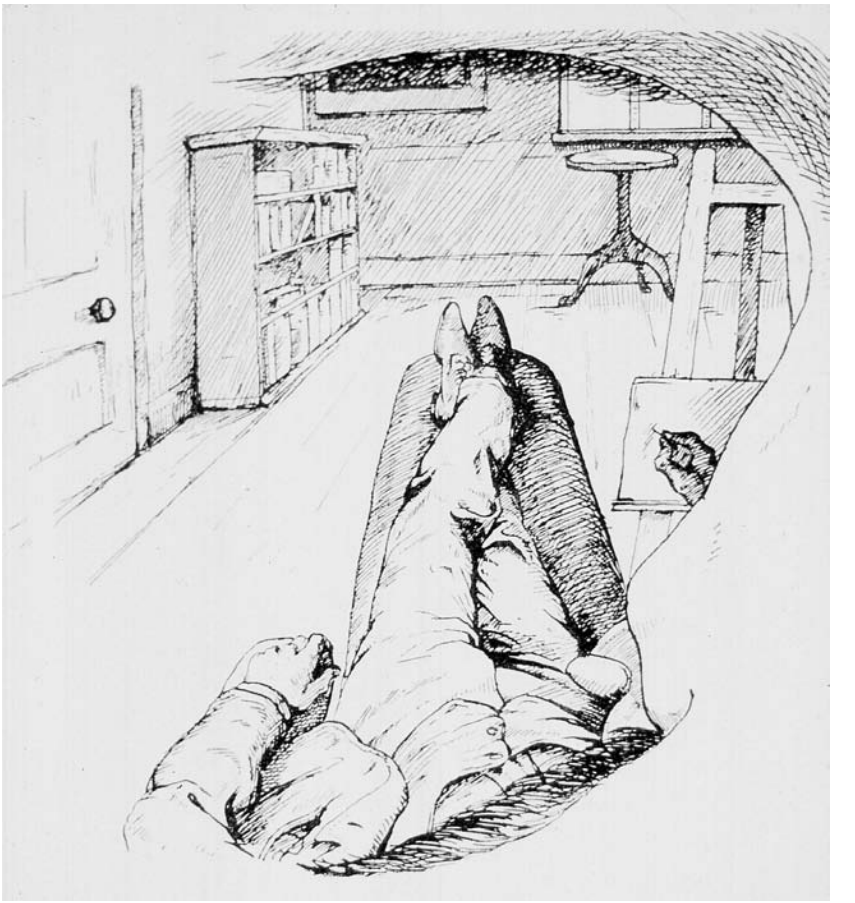

Figure 12. Mach takes in self and office. From *The Grammar of Science* (all editions; this figure from second edition).

oughly transformed with age "that the man would probably feel the boy a perfect stranger if he were brought into his presence."[66]

This dissolved self of Mach's drawing and of the parable of the blackboard combined Pearson's enduring anxiety about the dissolution of individuality with a utopia of connectedness with the world, of egoism annulled. In the end, Pearson's enshrinement of self-denying method did not allow the deep affinity with nature for which he longed, and which in

[66] Pearson, *Grammar of Science,* 189, 78–79, 84–86.

a way was allowed by Mach's philosophy. This point is clarified by the revealing contrast between Pearson's scientific ethos and that of a different Victorian "grammar."

The *Grammar of Assent* and the *Grammar of Science*

This other grammar was by John Henry Newman, later a cardinal, who developed a fascinating perspective on the relations of religious to scientific belief. Pearson, as a youthful philo-Catholic, had thought Newman "splendid" in his 1864 *Apologia pro vita sua,* a book written in response to the Protestant sniping of Charles Kingsley, "who [wrote Pearson] was ignorant of history & the Fathers." There is no record of his reaction to the *Grammar of Assent,* and he certainly rejected the idea that truth is only possible through acceptance of Christ's divinity. Still, the resonances of Pearson's book with Newman's 1870 *Grammar* suggest elements of a shared sensibility, lingering elements of Pearson's philo-Catholicism, which spoke, however, to experiences that he by 1892 had determined to renounce in the name of science.[67]

As a young man Newman had written on probability, in an essay against Hume's refutation of miracles, but his gradual move to Catholicism was attended by a growing disinclination to ground faith on the rational weighing of evidence. In modern times, he thought, formal reasoning was most often an obstacle to faith, though needlessly. He explained in his *Idea of a University* that "the intellect in its present state . . . does not discern truth intuitively, not at a glance, but, as it were, by piecemeal and accumulation, by a mental process." His philosophical arguments were intended not to provide the rational grounds of faith, for faith should rest on something more spontaneous and intuitive. He aimed rather to lighten the anxiety and self-doubt brought by intellectual objections, the abstractions that so often lead people astray.[68]

Newman considered that abstract propositions, mere "intellectual ideas," can never be so "vivid and forcible" as "the experience of concrete facts." Assent is more easily granted to things than to notions, and living contact with the world makes a far greater impression on the mind than does logical argument. He wrote his *Grammar* to vindicate the results of this engaged and informal reasoning, reasoning that provides a basis for

[67] KP to his daughter Sigrid, 15 Feb. 1913, Pearson Papers 926, about his reactions "30 years ago"; Pearson also discussed Newman with Parker: Parker to KP, 22 June 1879.

[68] John Henry Newman, *An Essay in Aid of a Grammar of Assent* (1870), ed. I. T. Ker (reprint of 8th ed., 1889; Oxford: Clarendon Press, 1985), 119; Newman, *The Idea of a University* (1873; New York: Chelsea House, 1983), 134. This discussion is based on Porter, "Reason, Faith, and Alienation."

action. Logic, by contrast, was often the mere spinning of wheels. More attentive to form than to content, it too often ignored the issues that really matter. "Logicians are more set upon concluding rightly than on right conclusions."[69]

True assent, implying far more than rational conviction, was for Newman a form of imagination and a manner of living. Not desiccated theology, but living religion, was his principal concern. Following the Catholic tradition that appealed also to Pearson, Newman condemned the confusion of religion with reason, preferring tradition and ritual as a basis of faith. Real assent was implicit, like a reflex action. Once subject to rational investigation, weighed and measured, it was no longer real, but mere opinion. There was, to be sure, a legitimate role for dogmatics. In Catholic countries, its burden was assumed by the Church, thereby enabling the people to live with the joy of implicit faith. "As to Catholic populations, such as those of medieval Europe, or the Spain of this day, or quasi-Catholic, such as those of Russia, among them assent to religious objects is real, not notional. To them the Supreme Being, our Lord, the Blessed Virgin, Angels and Saints, heaven and hell, are as present as if they were objects of sight."[70]

Pearson made just the same point in his story about the passion play at Brixlegg, where the peasants experienced God, Devil, and Hell as "intensely real," as real as the umbrella that God had restored to its owner. As an old man, Pearson still looked to that peasant realism with nostalgia, even if he dismissed it as groundless from the standpoint of reason. In the same way, he described nature with evident longing. His scientific sensibility was consonant with his religious doubt. Real experience of objects of faith remained inaccessible to him in both domains, and science demanded renunciation. Newman regarded this skeptical outlook as a consequence of alienation from the true church. A preoccupation with reason had delayed his own accession to the Roman Church. His scientific faith had suffered analogously: without the benefit of the Catholic faith he had been unable to believe in the central categories of experience, such as space, "except as a subjective idea of our minds." Newman would have seen resemblances between Pearson's *Grammar* and his own youthful philosophical attitudes. His conversion, as he explained, enabled him to establish a new harmony of scientific and religious understandings, one that no longer tried to overcome the instinctual sense of nature. The natural human receptivity to concrete experience was, for him, healthy and legitimate. Newman wrote in 1864 of "a rising school of philosophy now, which considers phenomena to constitute the whole of our knowledge in

[69] Newman, *Grammar of Assent,* 14, 66.
[70] Ibid., 42–43.

physics. The Catholic doctrine leaves phenomena alone. . . . It deals with what no one on earth knows anything about, the material substances themselves."[71]

Newman offered this last passage, encompassing a vision of science, in support of transubstantiation. He took the same view of other religious doctrines, such as the Trinity. Conscience, innate and universal, was for him the fundamental basis of religious conviction. It is experienced as a moral sense, which seeks its grounding in God. Newman conceded that such reasoning is not ironclad, but who could dispute it when natural science proceeds in the same way? The visual sense, for example, is at first "mere images on the retina," and yet it provides "the means of our perceiving something beyond them." As sense information leads us to the world, so conscience leads us to God. By inductions from the experience of conscience we may "have as good a warrant for concluding the Ubiquitous Presence of One Supreme Master, as we have, from parallel experience of sense, for assenting to the fact of a multiform and vast world, material and mental."[72]

Newman endorsed the results of spontaneous, uncritical human thought in a way that Pearson found enticingly alien, and that he could not countenance. In practical life, Newman argued, we often know as if by instinct, an instinct that is not innate but formed through practice. Just as a peasant learns to predict the weather or a physician to diagnose ailments, though neither could explain his reasons, so are we led to faith in the divine. Newman called the ability to reason correctly but without rigor the "illative faculty." It could be developed to the point of genius, as with Newton, who had been able to perceive mathematical and physical truths where proof was absent. For the grammarian of assent, science stood for the intuitions that led to truth from limited sensory knowledge. The grammarian of science, by contrast, was walled off in his telephone exchange, receiving and sending out nerve impulses but never knowing who or what was at the other end of the wires. A few years after completing his *Grammar,* Pearson included in his mocking review of Arthur Balfour's *Foundations of Belief* a strikingly personal rejection of the attempt to reason from sensations of phenomena to real objects. Speaking of his youthful loss of faith, he recalled "five years of life struggling with much bitterness out of the mazes of metaphysic and theology, only to find in agnosticism the peace which arises from understanding." He conceded in this passage the justness of the equation between the passage from experi-

[71] John Henry Newman, *Apologia pro Vita Sua* (1864; reprint, New York: Chelsea House, 1983), 96, 137, 238.

[72] Newman, *Grammar of Assent,* 47. In his tract 73 in 1836 he had insisted on faith to reach beyond what is in the mind; see Richards, "The Probable and the Possible," 56–57.

ence to knowledge of a material world and the passage to faith in God. But he scorned both lines of reasoning, the one as metaphysics and the other as theology. The utter remoteness of the world had its prototype in the inaccessibility of God.[73]

Pearson's arguments for the detachment of man from nature, his alienation from the world that his own mind had produced, placed him also in opposition to Mach. Here perhaps is his most fundamental difference from the Austrian, of whom he has often been called a follower. Mach, an admirer and practitioner of G. T. Fechner's psychophysics, refused to countenance belief in an external world mainly because he held that the world could never be external. Every particle and every experience mixes mind and matter together. We do not confront the world as something external, but swim in it and are dissolved into it. For Pearson, in contrast, the world (though created by mind) could never be comprehended by mind, and it permitted reliable regularities to be described only by the assistance of a self-denying method.

Mach, like Newman, insisted on the continuity of scientific knowledge with everyday experience, and even with the mental life of animals. Mach wrote: "The designed quantitative experiment yields many rich particulars, but the quantitative representations derived from it are supported with the greatest certainty when we can connect them to our raw experiences." He argued that we know the world because we participate in it, and share its dynamic, that otherwise science would be impossible. "If the self is not a monad isolated from the world, but a part of the world immersed in its flow, from which it has come and into which it is ready to be poured again, then we will no longer be inclined to regard the world as an *unknowable* something. We are then *near* enough to ourselves and *related* enough to the other parts of the world to hope for real knowledge."[74] But the world of the *Grammar of Science* was always at a distance.

The Statistical Grammar

The denial by Mach and Pearson that science can gain access to a world of objects has sometimes been read as the harbinger of a new skepticism, the onset of our modern intellectual crisis. In no way, however, did Pearson's

[73] Newman, *Grammar of Assent,* 214–215; Pearson, "Reaction! A Critique of Mr. Balfour's Attack on Rationalism" (1895), in *Chances of Death,* vol. 1, 173–225, on 194–195, 192.

[74] Ernst Mach, *Erkenntnis und Irrtum: Skizzen zur Psychologie der Forschung,* 5th ed. (Leipzig: Johann Ambrosius Barth, 1926), 193, 426 (my translation). See my "Reason, Faith, and Alienation," and "Death of the Object."

positivism imply doubts about the validity of science. On the contrary, the denial of an independently existing material world permitted science to be universalized and made into the basis of a new morality. Even if he despaired of the possibility of unmediated experience of nature, he was deeply committed to an all-embracing science. Because science was grounded in method and not in any distinctive properties of some domain of nature, the scientific attitude could be applied to any investigation whatsoever, to practical as well as theoretical questions. "The unity of science consists alone in its method, not in its material."[75]

However attractive the prospect of merging with nature or of slipping out into the fourth dimension by way of an ether squirt, Pearson endorsed in his *Grammar* the stony path of self-denial. Mathematical probability accorded nicely with this vision of science, and although it was not a topic in his Gresham lectures of early 1891 on the "Scope and Concepts of Modern Science," he was able to incorporate a chapter on cause and effect almost seamlessly into the volume. There he denied that nature could have any inherent necessity, since its laws were "essentially an intellectual product." "Force as a cause of motion is exactly on the same footing as a tree-god as a cause of growth." Mathematics, as a mental product, admitted no more precision than other human perceptions. There is no absolute sameness in the world, he explained, but always variability. "Geometry might almost be termed a branch of statistics, and the definition of the circle has much the same character as that of Quetelet's *l'homme moyen*." A defensible comprehension of physics, he explained later in some statistical lectures, must follow the lead of the sciences of life. Since you can never repeat all the causes, not even in a physics experiment, the effects are never the same, except approximately. "This conception has been long realized by the biologist, and his colleague the sociologist. It is only the physicist who has stated a rigid law of cause and effect, as if it were something in Nature itself and not in his own way of looking at nature."[76]

Probability also supported his antimaterialism. "It is not a question of reducing the universe to a 'dead mechanism,' but of measuring the amount of probability" that a complex description of change could be replaced by a simpler one. For this purpose he invoked a very traditional language of subjective probability, deriving from Laplace and Augustus De Morgan, whose works he had studied as a King's College undergraduate. More recently he had investigated the writings on probability of William Stanley Jevons and Francis Ysidro Edgeworth. Pearson, framing his prob-

[75] Mach, *Analysis of Sensations,* 310–312; Porter, "Death of the Object," 138; Pearson, *Grammar of Science,* 15.

[76] Pearson, *Grammar of Science,* 140, 144, 212; last quote from notes for lectures on statistics, dated 1907 by the archivist, Pearson Papers 69.

lem in terms of the probability that a "routine of perception" will continue into the future, was able to dispense with mechanical necessity, while demonstrating at the same time the irrationality of belief in miracles.[77]

This union of philosophical idealism or positivism and probability seemed a natural one, and *The Grammar of Science* easily accommodated his new materials on evolution and correlation in the second edition of 1900. By then, his statistics and his philosophy of science appeared as part of a single package, a statistical scheme of scientific description. But the philosophy preceded the statistics in his intellectual development. The probability chapter of the *Grammar of Science* shows how Pearson was gradually being drawn to the program of quantitative research that would soon capture his interest and hold it for more than forty years.

There were other elements of continuity with statistics. His preoccupation with the social function of science was one of these. He framed the *Grammar of Science* in terms of a desperate social need for consensus. In the Darwinian struggle of society against society, those nations that could not unite individuals into a coherent social whole must fail. Yet the social and economic changes of his own era were, he thought, so dramatic, that every question, from religion to economy, provoked fundamental conflicts of opinion. The individual needed a way "to form a judgment apart from his own feelings and emotions," one "free from personal bias." The greatest duty of the "scientific man" was "to aim at self-elimination in his judgments, to provide an argument which is as true for each individual mind as for his own."[78] As he explained in redolent religious imagery, the freethinker, "to be reborn, must cut away *all* the old delusions" and build up a positive creed from "the disconnected laws and half-solved problems of modern research."[79] *The Grammar of Science* defined the method of science in general terms, the classification of facts and search for generalizations. It was really a moral ideal, of respect for facts and suppression of self, rather than a technical one, and Pearson never limited scientific method to statistics. Yet statistics became for him, and for many admirers, a model of impersonal and rigorous reasoning, applicable to almost every domain, and therefore of particular value in modern society.

One final element from the *Grammar of Science* that points in the direction of Pearson's imminent conversion to statistics is the historical understanding within which he situated it. His grand vision of cultural

[77] Pearson, *Grammar of Science,* 137, 139; see also file labeled "Theory of Probability" and signed "Carl Pearson, King's Coll.," in Pearson Papers 46. On science as description, see Heilbron, "Fin-de-Siècle Physics," though Pearson does not fit Heilbron's characterization of "descriptionism" as a retreat from confrontation with traditional elites. On subjective probability, see Porter, *Rise of Statistical Thinking,* chap. 3.

[78] Pearson, *Grammar of Science,* 6–8.

[79] Pearson, *Positive Creed of Freethought,* 9.

progress drew more heavily on Darwin by 1892 than it had a decade earlier, yet he remained a historical socialist, seeking social rather than individualistic explanation. Although the unappealing figure of Luther might be made to stand for the unfortunate religious movement he led, Pearson always believed that Luther had been made possible by historical conditions and that the Reformation was rooted in a much broader process of social and economic evolution. So also in his own day, he had long held that the moral and intellectual condition of the population gave the measure of a culture and defined the possibilities for its future. This historical picture supplied the background for some of Pearson's earliest use of statistical language. "We have been too apt to measure an age by its Darwins, its Goethes, and its Ibsens, by its individual geniuses rather than by its average type," he proclaimed in a Sunday lecture at South Place in 1888.[80] Historicism, not mathematics or eugenics, was the ground from which this collectivist insight initially grew. His scientific philosophy set out from a social vision of history as made by the masses and, concomitantly, of the moral obligation of individuals to serve the larger society. If the chaos of egoistic capitalism was the great problem of the day, scientific education could provide a solution by defining impersonal standards of knowledge. When the *Grammar of Science* went to press in January 1892, Pearson did not yet see his way to mathematical methods by which the problems of society could be comprehended and managed. But in the new century it could easily be read as the philosophical background to Pearsonian statistics.

[80] Ibid., 12.

CHAPTER EIGHT

Scientific Education and Graphical Statistics

> "What we still refer to as personal destiny," Ulrich said, "is being displaced by collective processes that can finally be expressed in statistical terms."
>
> Agathe thought this over and had to laugh. "I don't understand if, of course, but wouldn't it be lovely to be dissolved by statistics?" she said. "It's been such a long time since love could do it."
>
> —Robert Musil, *The Man without Qualities,* trans. Sophie Wilkes, p. 785

AT THE FINAL meeting of the Men and Women's Club, on 11 March 1889, Pearson reported on Francis Galton's new book, *Natural Inheritance*. He thought it important but saw "considerable danger in applying the methods of exact science to problems in descriptive science, whether they be problems of heredity or political economy." Pearson feared that mathematics might seduce sociologists with its "logical accuracy," and distract them from the wide-ranging complexity of real human life. Galton's quantitative analogies of genetic processes to cookery books and political elections seemed odd and profitless. But at least he kept clear of the "metaphysical regions of germ plasm," devoting himself instead to an empirical, "English" effort to measure "the great unwashed." In 1889, then, Pearson's view of human science was like that of many historical economists: he approved of measurement and descriptive statistics but was suspicious of mathematical zealotry.[1]

Within a few years, his mathematical doubts gave way to a new enthusiasm and a new scientific direction. Pearson saw that statistics could be made mathematical and might infuse the practices of the "descriptive scientist" with some of its logical accuracy. This could be especially valuable in regard to the great social and economic questions, where interested opinion so often held sway. As an applied mathematician, he was in a way well equipped for this new field of activity, and there were mathematical continuities between his earlier and later careers. Yet Pearson's conversion

[1] Karl Pearson, "On the Laws of Inheritance According to Galton," read 11 March 1889, Pearson Papers 10/19. On mathematics and statistics, see Porter, "Rigor and Practicality."

to statistics was no natural expansion of technicality in science. It involved, rather, a new vision, one that he acquired not through a single Eureka experience but episodically, over about three years. Toward the end of that transition, in 1893, he would acquire a passionate commitment to the statistical study of biological evolution, Galton's favorite field. Initially, his new interest in statistics grew out of an ideal of education, the cultivation of a more effective citizenry. This was the mission of his *Grammar of Science*. It was expressed also in an intensive campaign of university reform, which came to a climax, and then largely failed, in 1892.

The cramped utilitarianism of students is a not unfamiliar source of professorial dissatisfaction. Pearson wanted to teach the scientific attitude, an imaginative and yet critical outlook that would promote enlarged understanding rather than unthinking routine and would maintain its validity even as the content of knowledge evolved. During the late 1880s he fixed on graphical methods as his central contribution to the formation of the budding engineers who populated his classrooms. He began to investigate graphical statistics as a corollary to the "graphical statics" he taught at University College, which he modestly envisioned as the core of a revolution in mathematical problem solving. As a newly appointed professor at Gresham College, an institution associated with commercial and financial activities, he thought statistics a fitting topic of instruction. Unexpectedly, he found that the graphs of trade and population he presented on lantern slides during his evening lectures in the City could be adapted to address the evolutionary questions he had begun discussing with his new biologist colleague at University College, W.F.R. Weldon. The biometric problems that fired his enthusiasm for statistics as a vocation were structured by a geometrical sense that evolutionary processes could be detected from the shape of the graphs.

Graphical statics had the virtue of holding the scientific question before the eye as something comprehensible rather than submerging it in a sea of algebraic symbols. In his initial exuberance, Pearson thought he could read the effects of natural selection directly from frequency curves. A geometrical intuition and a commitment to curve fitting underlay his resolute statistical campaign to overthrow the tyranny of the normal law in favor of a less restrictive family of frequency distributions. Pearson sought a form of mathematics general enough to comprehend and summarize the complex processes of nature, and eventually to solve some of the pressing problems of social life.

Forming the Efficient Citizen

The Grammar of Science was dated January 1892. On 3 February, Pearson sent off to press a collection of his university writings, some of which had

appeared in *The Academy* over the previous eight years, completed by a series of articles for the first three February numbers of the *Pall Mall Gazette*. Its hurried publication reflected the urgency of the moment, since the "Albert Charter" for a reconfigured University of London was about to be taken up in the House of Commons. The author of the *Grammar* had definite views on education, particularly concerning the relations of research and teaching at the university level. He nurtured several levels of discontent with his own academic situation and looked to proper university reform to enable him to contribute more effectively to a needed scientific reformation.

Pearson's appointment as professor of applied mathematics, in June 1884, coincided with a period of ferment concerning higher education in the British metropolis. In May, an Association for Promoting a Teaching University for London had begun campaigning to reorganize the London colleges. The range of alternatives under consideration appeared unacceptably narrow to Pearson, who thought the proposed remedies worse than the current defects. He objected especially to the preoccupation with tests as the proper instrument of reform. The heterogeneous collection of colleges that formed the University of London had little in common but shared subjection to a regime of degree examinations. The nerve-center of the examination-university was at Burlington House, and the chief proposals would merely strengthen its hold on the system. Their advocates saw testing as a way to infuse higher education with a new element of discipline, paired with opportunity. The reconfigured university, as they imagined it, would reach from the relatively elite University College and King's College London to trade schools, women's colleges, and London Extension. All who chose to pursue a given course of study would have the opportunity to prove themselves according to the same standard.

Pearson loathed this proposed system of uniformity, complaining that it would corrupt teaching rather than improve it by eliminating everything distinctive offered by the stronger institutions. It would enable "every secondrate teacher" to "appeal to the democracy" for equality with the better institutions, "which will simply mean that universities are to cease to be outside Oxford & Cambridge." He thought it difficult enough already to interest students in the more abstract and scientific forms of knowledge, the new methods and discoveries that, in the end, would most benefit them and their society. But if this kind of education was not available at the weakest institutions in the "university," it would be politically impossible to include such topics on the examinations. Students, in that case, would resent being compelled to learn such material, and teachers at the more academic colleges, many of them dependent on student fees for their livelihood, would inevitably be pulled down to the level of the lowest. Pearson referred to the reform scheme as an "omnium gatherum," an

indiscriminate collection, when the thing most needed was to merge the "better and more efficient of the colleges into a real university."

He based this recommendation on his own experience at Cambridge, whose great advances, along with Oxford, since the University Test Acts of 1871 he attributed to the abolition of religious constraints and above all to the subordination of colleges to university. This move to greater unity had permitted real university teaching to supplant the work of coaches and "crammers." But it was only possible because of the shared traditions and close physical proximity of the constituent units. He proposed a thought experiment: What would happen if Oxford students were compelled to prove themselves by taking Cambridge examinations? A circle of Cambridge crammers would form itself around Oxford, and draw the students away from their recognized teachers. To subject students from one institution to the testing regime of another would undermine its whole educational mission. "Every university that is worthy of the name has its idiosyncrasies, its peculiar lines of strength and weakness; and its examinations will be moulded on these lines."[2]

Pearson's answer to the campaign for a London teaching university was an "Association for Promoting a Professorial University for London," established in 1891. His allies included men of science such as Weldon, Sir W. T. Thiselton-Dyer, Edwin Ray Lankester, and G. Carey-Foster, who drew up a plan and enlisted the support of some notable individuals from literature and scholarship, including Thomas Hardy and George Meredith. While they were able to defeat the proposal for an Albert University, their more positive ambitions proved unattainable. Huxley, who was persuaded to assume the presidency of the organization, proved in the end unwilling to support the ideal of professorial self-governance, preferring, as Pearson complained, to negotiate a compromise among the interests. He acted with the support of some on the executive committee, including Weldon.[3]

Pearson, feeling betrayed, resigned as secretary and published an open letter to Huxley in the *Times* on 3 December 1892. He was compelled to withdraw, he explained, because his list of "distinguished names" had signed on to a different cause from the one now put forward. Weldon criticized him sharply in a private letter, and Huxley responded in print that while all professors should be "good specialists," only some are good ad-

[2] KP to Oliver Lodge, 23 March 1892, Lodge Papers MS Add. 89/81; Karl Pearson, "The Royal Commission," from *The Academy,* 22 June 1889, in Pearson, *The New University for London* (1892), 52; also Pearson, "Sir George Young's Defence . . ." (*Academy,* 16 Jan. 1892), in *New University,* 102.

[3] Pearson, "Walter Frank Raphael Weldon," *Biometrika,* 5 (1906), 1–52, on 20–21; also see Pearson Papers 17 and 19 on the "professorial university in London."

ministrators, and that there is unfortunately also "a fair sprinkling of one-idead fanatics" within the professoriate. The inmates could scarcely be allowed to govern themselves, it seems, without a counterweight of sound practicality. This language was a red flag to Pearson, who recognized himself in Huxley's epithet and whose mission in life it was to obliterate this typically English divide between scientific reason and practical good sense. Is the idea of a great university now to be dismissed as "the plaything of "one-idead fanatics?" he asked. "I am quite willing to accept Professor Huxley's description of myself as a 'one-idead fanatic,' it being the usual name for those who attempt to carry out in practice what they preach in theory. I am content to leave vague statements and ill-defined compromises to 'practical' men and 'administrators.' "[4]

These reform debates at home reawakened Pearson's old love of German science and culture, and he was mocked for advocating a Berlin University on the Thames. While he also mentioned Edinburgh, it was indeed the German capital that figured for him as the proper model for a London university, with scientists such as Helmholtz, Du Bois-Reymond, and Virchow whom he held up as exemplars of a professoriate combining scientific excellence with broad learning. He also looked to history for a deeper perspective, and his university views involved a distinctive compound of medievalism and modernist urgency. He pictured the university as a "guild of learning," guiding the apprentice from "receptivity to self-production . . . and the full freedom of the guild," and yet also as a purveyor of modernist efficiency. Efficiency was to be grounded not on narrowly utilitarian training, and certainly not on cramming for examinations, but on the slow maturation, under the direction of a master, of the student's critical reasoning faculties. The object of a university, he explained in 1885, "is to develop the intellectual life, in the broadest sense, the theoretical and scientific knowledge of its students and members." Or, in another idiom, he spoke of "the promotion of a wider and more efficient learning." Only a university of teachers and students, living and working together in pursuit of higher learning, could provide an "education and training of those citizens whose knowledge and thought are to leaven the community, for . . . that staff of scientists, specialists, leaders of industry, and representatives of culture in and outside the learned professions upon whom the welfare of the nation so largely depends."[5]

[4] See the exchange of letters in the *Times:* KP to Huxley, 3 Dec. 1892, 4; Huxley to KP, 6 Dec. 1892, 11; KP to Huxley, 8 Dec. 1892, 10; also Weldon to KP, 3 Dec. 1892, Pearson Papers 891, and Pearson, "The Present Aspect of the University Problem," *Academy,* 42 (24 Dec. 1892), 589–590.

[5] Pearson, "The OMNIUM GATHERUM. Lord Justice Fry's Scheme and Sir George Young's First Scheme" (*Academy,* 5 Sept. 1885), in *New University,* 18, and "The Second Scheme of the London University Senate" (*Academy,* 2 May 1891), in *New University,* 61, 58.

Pearson's defense of science in terms of "national efficiency" found, later, a kind of home in an organized movement led by the Earl of Rosebery, which, as usual, he did not join. It is easy, more than a century later, to misunderstand him. "Efficiency" was not, for him, a deflating word, implying the reduction of all activities to some bottom line of output divided by input. *Efficient* here meant something like *efficacious,* the capacity to get things done and contribute to society. This would require a high level of theoretical and cultural awareness. Not ratios of energetic or economic quantities, but well-considered decisions based on deep understanding exemplified his conception of efficiency. He believed, to be sure, in specialist expertise, and he argued, for example, that Bedford College, a college for women, could not pretend to the dignity of a major teaching body because geology and botany were taught there by the same woman, and Greek philosophy and political economy by the same man (Francis Ysidro Edgeworth, in fact). The need for specialized knowledge, however, had somehow to be made compatible with a balanced intellectual formation, supporting what he would in 1905 characterize as "that classified experience which we term wisdom." This, and not easy, narrow, or automatic answers, was for him the proper goal of an education in science.[6]

A Grammar for the Modern Age

Pearson's vision of education, in some ways a quite traditional one, emphasized the development of the powers of mind over the transmission of factual material. On educational questions, he particularly admired Mark Pattison of Lincoln College, Oxford, who campaigned to integrate classical ideals with modern content. This meant the acquisition of liberal culture, which, as Pattison explained, "is not the knowledge of facts, but intellectual grasp—not a collective acquaintance with many sciences, but a harmonious survey of knowledge, in all its aspects, as a whole." By such means were intelligence and character to be formed: "No one will dispute that the aim of education is less to inform the mind, than to exercise and call out the faculties." Classical learning, representing the best of human knowledge, had been the indispensable instrument of cultivation in the Renaissance. The intervening centuries, however, had brought forth a great intellectual transformation, and now this exalted position belonged by right to science and scholarship. Huxley later, in his exchanges with Matthew Arnold on "science and culture," repeated this argument for scientific education. Arnold did not exactly disagree and even anticipated a

[6] KP to Alice Lee, 19 Feb. 1892, Pearson Papers 919/3; Pearson, *National Life from the Standpoint of Science* (1905), 14.

change in religion as great as the Reformation. But to many champions of classical learning, such as John Henry Newman, natural science meant merely utilitarian studies, the sacrifice of intellect to the purposes of the moment.[7]

Pattison, who for some years had moved in Newman's orbit, might, with Pearson, have found too much of mere practicality in Huxley's position. He complained that scientific education was too often merely technical, conveying the facts of a specialty rather than a spirit of philosophic inquiry. Advocates of science allowed an "easy victory to the classicists" when they "lost sight of the truth, that for the purposes of education knowledge is only a means,—a means to intellectual development." The guardians of classical education were correct to reject this narrow view of science, and to insist that students be presented with "intellectual culture" rather than heaps of factual nuggets. But the intellectual culture of the mid-nineteenth century could no longer be conveyed in the form of ancient literature. It had to take account of modern science.

Fearing the "disabling effects" of excessive specialization, Pattison called on the schools to vivify scientific content by cultivating philosophical awareness. Grammar would remain in the curriculum, but as means rather than end. It was a propaedeutic, providing access to the "higher scholarship." He added: "Just so it is with logic. The logic of the schools, a certain more or less arbitrary collection of formal laws of reasoning, is the grammar of the higher moral or physical sciences. But the whole utility of this grammar is annihilated, if it be not followed up by an advance into those sciences."[8]

Pearson's *Grammar of Science* was also at bottom a tract in support of educational reform and was continuous with Pattison's vision. The choice between wide-ranging inquiry and tightly focused research was for him a pressingly personal one. Statistics would soon cut through the knot, since this was a methodological specialization that bore on a whole world of scientific problems. But few fields could claim this kind of generality, and even statistics was more consequence than cause of the *Grammar*'s celebration of scientific method. Method was the antithesis of narrowness, a third way between self-indulgent dilettantism and the idiocy of disciplinary confinement. Pearson pronounced it fundamentally the same in every domain of knowledge. "The unity of all science consists alone in its

[7] Mark Pattison, "Oxford Studies" (1855), in *Essays,* ed. Henry Nettleship (Oxford: Clarendon Press, 1889), 415–494, quotes on 435, 424; T. H. Huxley, "Science and Culture" (1880), in *Science and Education: Essays* (1893; reprint, New York: Greenwood Press, 1968), 134–159, on 152; Matthew Arnold to Huxley, 29 Aug. 1875, Huxley Papers 10.155, Imperial College Archives; Newman, *Idea of a University,* 94, 128, 135. See also White, *Thomas Huxley,* chap. 3.

[8] Pattison, "Oxford Studies," 433–434, 423.

method, and not in its material." Scientific method applies "to social as well as to physical investigations," and, as a "scientific frame of mind," is by no means the preserve of the "professional scientist." It is rather "the method of all logically trained minds" and "an essential of good citizenship," for it is simply "the habit of dispassionate investigation. . . . The scientific habit of mind is one which may be acquired by all. . . . Modern science, as training the mind to an exact and impartial analysis of facts is an education specially fitted to promote sound citizenship."

If these claims for science were about truth, they bore no less on morality. Science was distinctly social because it inculcated standards of knowledge that went beyond personal interest and blind prejudice. Pearson was still a socialist, after a fashion, calling on science to supplant the regrettable selfish competition of capitalism. Such an idealization of science or professionalism was becoming increasingly common across Europe and America in the late nineteenth century. But Pearson put less emphasis on the scientific community than, for example, Charles Sanders Peirce, calling instead for the education to scientific morality of every citizen. This was not only for the good of humanity, but rather, and more directly, for that of the race or the state. In the modern Darwinian struggle of society against society, impersonal standards of knowledge and action were indispensable. "The importance of a just appreciation of scientific method is so great, that I think the state may be reasonably called upon to place instruction in pure science within the reach of all its citizens."[9]

In this introductory chapter to his *Grammar,* Pearson identified three vital "claims of science." The second and third announced its applicability to social problems and to technology. In emphasizing its essential practical role in the modern age, Pearson was at one with a generation of British reformers. But for him, scientific study was as much about the cultivation of self as about the needs of society. The first and most essential claim of science was its role in forming the citizen, for whom the scientific habit of rational thought was always, and simultaneously, a moral virtue, because it raised the individual above self. This was consonant with the classical ideal of education that Pattison had praised. Pearson the scientist was no less appreciative of the educational value of the grammar of dead languages than the more literary and philological Pattison. He explained in a footnote the benefits of such study for his own mental development. Although he had forgotten most of the facts he learned in school, "the notion of *method* which I derived from my instructor in Greek grammar . . . remained

[9] Pearson, *Grammar of Science,* 7–15. See Yeo, "Scientific Method and the Image of Science"; Yeo, "Scientific Method and the Rhetoric of Science"; Hollinger, "Inquiry and Uplift"; and Haskell, "Professionalism *versus* Capitalism."

in my mind as the really valuable part of my school equipment for life."[10] His choice of "Grammar" over "The Creed of Science," or "The Spirit of Science," both of which titles he had earlier contemplated, emphasized the continuities with a more traditional form of education. His object was to meet Pattison's challenge, to present science as the basis of intellectual culture, and thereby as deserving a central place in the university curriculum.[11]

Indeed, not only philosophical science but every honest discipline was vindicated by Pearson's perspective on education. "To decry specialization in education is to misinterpret the purpose of education." For method could not be mastered fully in the abstract, but had to be confronted in practice. *The Grammar of Science,* reflecting perhaps its origin as popular lectures at Gresham College, even held out the prospect of acquiring some of these methodical virtues through self-study. Perusing scientific textbooks would give only loose hints of the scientific spirit, but the intensive study of a single discipline could work wonders. "Those who can devote persistently some four or five hours a week to the conscientious study of any *one* limited branch of science will achieve in the space of a year or two much more than this." And it doesn't matter what science our "busy layman" chooses, be it geology, biology, geometry, mechanics, or even history or folklore. The only requirement was to concentrate the attention, and to learn some particular field well. In this way, Pearson reconciled disciplinary focus with breadth of vision, defining the accomplished specialist alone as qualified to be an effective generalist. The narrow passage through the eye of this needle would give access to the wide-open spaces of the scientific spirit.[12]

Any area of scientific inquiry could provide guidance on method, but narrowly practical study would not. Pearson strongly discouraged his readers from selecting a field of investigation in order to glean useful facts for their profession. Mere facts do not an education make; the point was

[10] Turner, "Public Science in Britain: 1880–1919," 8n. Compare Hermann von Helmholtz, "On the Relation of Natural Science to Science in General" (1862), in Helmholtz, *Science and Culture: Popular and Philosophical Essays,* ed. David Cahan (Chicago: University of Chicago Press, 1995), 86–87, on the educational benefits of Greek or Latin grammar, which, because they were more fully governed by rules than modern English or German, inculcated an uplifiting faith in regularities. Science, however, prepared the mind still more effectively, surpassing even the deadest of dead languages, because its laws admitted no exceptions whatsoever.

[11] Havelock Ellis to KP, 24 March 1891, Pearson Papers 683/3, and KP to Parker, 9 April 1891. He already intended the lectures as a book for Ellis's "Contemporary Science Series"; see KP to Macaulay, 21 Jan. 1891.

[12] Pearson, *Grammar of Science,* 8, 14.

to open the mind to a deeper understanding, and to nurture the freedom from bias that follows from it. Science makes its greatest contribution to society when it transcends the requirement of immediate practicality. In this way, Pearson's *Grammar of Science* was made to endorse the cause of a real London university in place of a collection of trade schools. "I believe that more will be achieved by placing instruction in pure science within the reach of all our citizens, than by any number of polytechnics devoting themselves to technical education, which does not rise above the level of manual instruction." The proper outcome of such an education was not necessarily recondite or even unfamiliar. "There is a very excellent little book which many of you may have read recently, Baden Powell's 'Aids to Scouting'; it is a capital introduction to the true scientific method." To sum it up: "*Keep your eyes open and apply commonsense.*"[13]

Despite his extravagant optimism about the mental and moral improvement to be achieved through a moderately serious exposure to real science, he took a dim view of almost all the introductory works on science, and particularly of those in physics. For example, the "dogmatism" of Grant Allen's scientific books for working men was "a danger to genuine science." Evidently he thought them socially dangerous as well, on account of their radical materialism. He compared Allen to Luther, who should have been checked before he had Europe in flames, and he joked of longing for the days when misinformed heretics such as Allen were burned. Such defects of reasoning were not confined to popular authors. The materialism of the standard textbooks was almost as bad, if not immediately incendiary. While first-rate physicists were mostly agreed that matter would someday be reduced to a motion or strain in the ether, the textbook writers still spoke of force as inherent in matter. As his *Grammar of Science* was making its way through the press, he complained in *The Academy* that almost all the elementary books he received to review were bad. "If the critic reads these works honestly through, he can only be forced to the conclusions that the whole system of our elementary science teaching urgently needs remodeling, for all notions of clear definition and logical statement seem to have disappeared from it."[14]

Even some of the best scientists showed grave defects of interpretation. He was compelled to forgive the luxuriance of mechanical images in the work of a "giant" like William Thomson. As historian, he even conceded that for such men as Maupertuis and James Joule, theological conceptions had contributed to the advance of physics. To Macaulay he confided that George Gabriel Stokes, misguided purveyor of natural theology, was the

[13] Ibid., 14; Pearson, *National Life,* 38.

[14] Pearson reviews in *Academy,* 30 (1886), 330–331; 34 (1888), 421–422; 36 (1889), 272–273; 41 (23 April 1892), 400–401.

only really powerful teacher he had known at Cambridge, and that his scientific papers provided a particularly fine model of "ideals of good method."[15] Having proclaimed the incomparable value of genuine scientific study, he had to retreat in the face of the undoubted failure of so many distinguished scientists to see the world as he did. "It by no means follows that, because a man has won a name for himself in the field of natural science, his judgments on such problems as Socialism, Home Rule, or Biblical Theology will necessarily be sound. They will be sound or not according as he has carried his scientific method into these fields."

Among physicists this was particularly unlikely, because they misconstrued so completely the import and meaning of their research results. Hence the need for this grammar was not limited to working men misled by materialism, for the prevailing view of physics among its most renowned experts was also badly confused. Pearson hated the reification of "force" as much as he disliked materialism. Those who look to science for more than reliable descriptions will be susceptible to all kinds of errors. "One result of this obscurity we probably find in the ease with which the physicist, as compared with either the pure mathematician or the historian, is entangled in the meshes of such pseudosciences as natural theology and spiritualism."[16] The scientific method as intellectual panacea could not quite be sustained. Yet it was Pearson's mission to make these ideals work, to clarify the scientific conceptions of the scientists and to present them as a model for everyone else.

Mathematics for Engineers

Pearson appreciated being in London because of the platform it provided to speak on important issues, as well as for the potential greatness of its universities. But his professorship of applied mathematics at University College London was not altogether compatible with his high scientific ideals. The institution had been founded by utilitarians in 1826 and continues to this day to display the dressed-up skeleton of Jeremy Bentham. Its strong tradition of secularism distinguished it from King's College, London, its only peer among London institutions of higher education, and from Oxford and Cambridge. Still, it was principally a teaching college and lacked the means of Oxbridge to endow idleness and research. Engineering education began to be developed there in 1841, the first such program in England. The success of this practical curriculum was mirrored

[15] KP to Macaulay, undated (but filed with 1911 letters); Pearson, "Reaction" (1895), in *Chances of Death,* 214.

[16] Pearson, *Grammar of Science,* 9, and preface, vii–viii.

by declining enrollments in mathematics, rather a serious matter since the professor's earnings depended on student fees. Clifford's appointment in 1871 as professor of applied mathematics and mechanics was made possible by a gift from Sir Francis Goldsmid, which guaranteed a modest salary for the chair.[17]

The minimum, however, was not sufficient. Pearson showed no signs of discontent with his customer base of students for his first five years at University College, but in 1889 his friend and mentor Alexander B. W. Kennedy resigned his engineering professorship. Kennedy had set up in 1879 a teaching laboratory, where students could construct mechanisms illustrating their class work, including "geometrical models" and apparatus "for the mechanical description of curves." His laboratory initiated a form of engineering instruction that provided an exemplar for others in England and the United States, and also in a way for Pearson's own biometric laboratory more than a decade later. Kennedy's departure and prospective replacement by a "young, untried man" was a blow to Pearson's teaching aspirations as well as his emoluments. Without a celebrated engineering professor, there would not be sufficient demand for two mathematicians, and Pearson was "not the *one* who teaches the much required conic sections and trigonometry." Indeed, his fees diminished worryingly in 1890, and engineering enrollments continued to decline through at least 1896.[18]

These financial difficulties persisted for many years. He complained of them in a letter to Macaulay in August 1889, on the eve of his departure for a tour of Norway, where was planning to meet up with Maria Sharpe. The next January, in deep personal despair over his broken engagement, he began scheming to forsake London and stand for a professorship at Cambridge. He had already announced the need for a technical laboratory there in 1886, in opposition to the strange English prejudice that a new field is best established by creating an examination. The engineering Tripos, he complained, was like the mathematical one, made up of purely speculative problems: "Impossible bodies traverse impossible curves; impossible fluids flow in impossible receptacles; and impossible loads are im-

[17] KP to Oliver Lodge, 9 Dec. 1885, Lodge Papers MS Add 89/81; Bellot, *University College, London,* 51–52, 135–136, 323.

[18] Bellot, *University College, London,* 308–310; Kennedy report (with G. Carey Foster and Olaus Henrici), 17 Nov. 1874, UCL College Correspondence, filed under "Kennedy, Alexander B." See also Carlyle, "Kennedy." On student use of the laboratory, see reports in College Correspondence AM/C/59. One of these reports, L. F. Vernon Harcourt's (28 June 1889) proposal to hire Thomas Hudson Beare as Kennedy's replacement, noted that an effective professor would be crucial for maintaining student numbers in several science courses, but especially in applied mathematics. On fees and enrollments, see Beare to KP, 18 Dec. 1890 and 2 March 1896, Pearson Papers 631/9.

posed on the impossible surfaces of bodies whose elastic characters are without the range of practical experience." High-level mathematics was needed, and in this respect Cambridge had, potentially, the advantage over London, but why not emphasize real technical problems? Otherwise, the superiority of German engineers, trained now at technical institutes on a par with universities, "will not fail to tell in the race-struggle for existence."[19]

Early in 1890, while discussing an open position in engineering, he let it be known that he would like to found a "great engineering school" at Cambridge. At the same time he published a long memoir on the flexure of heavy beams, and although it scarcely stands among his outstanding research achievements, his ambitions for engineering in these years were first of all scientific, and only secondarily financial. Toward the end of the year, his love life now in order but his salary and program-building opportunities still unsatisfactory, he wrote of "the possibility of creating an all-round technical school at Cambridge. I believe in the possibility of directing a good deal of the dormant mathematical force into that field," a far more attractive prospect than the current disrepair at University College. Such technical education was not to be confused with mere "professional instruction." Its purpose was to provide training for the mind rather than to convey directly practical skills. Techniques of the trade were best passed on through apprenticeship, and there was no reason it should be at the expense of public institutions. As professor of engineering, Pearson hoped to teach "drawing graphics" and the more theoretical aspects of engineering such as bridge structure and the strength of materials. After learning from Macaulay that the appointment was likely to go to James Alfred Ewing, he withdrew his candidacy, seemingly without bitterness. There are signs, he wrote hopefully, "that Cambridge is at length aroused to the need of some touch with the practical and geometrical side of Mechanics."[20]

Under other circumstances, Pearson might have made his career in engineering mathematics. Years later, he imagined a life as engineer for his young son Egon, and told him of its rewards and demands. The engineering persona he envisioned was quite different from those young men who passed through his mathematics classes. "But you would have to work very hard now-a-days to do well in engineering and you must not think like

[19] Pearson, "A Plea for the Establishment of a Technical Laboratory at Cambridge," *Cambridge University Magazine,* 7 Dec. 1886, 173–174.

[20] KP to Macaulay, 3 Jan. 1890 and 20 April 1890; Pearson, "On the Flexure of Heavy Beams Subjected to Continuous Systems of Load, Part I," *Quarterly Journal of Pure and Applied Mathematics,* 24 (1890), 63–110 (part II appeared in vol. 31, 1899, 66–109); KP to Macaulay, 30 Oct. 1890; Pearson, review of E. J. Routh, *A Treatise on Analytical Statics, Academy,* 40 (1 July 1891), 38. On technical and professional education, see Pearson, *The Scope and Importance to the State of the Science of National Eugenics* (1907), 6–7.

some boys do that it means turning nuts & playing with screws."[21] Even in 1905, this was a prescription and not simply description. As with other aspects of his life, this dissatisfaction was suppressed from his recollections. When Egon was about to begin his own academic career, his father told him of "the sense of power and inspiration in holding a class of 80 or 100 highspirited young men, by the interest of your subject and your way of exposing it—when the failure would mean riot."[22]

But these potentially riotous youth, whatever the joys of commanding them, were scarcely paragons of scientific apprenticeship in Pearson's idealized university. There were too many "blockheads" who want nothing more than to turn iron on a lathe, as his new engineering colleague Thomas Hudson Beare put it. Pearson was often frustrated by the burden of teaching basic mathematics at University College, as well as by the salary pressures, for he remained dependent on fees for his living into the twentieth century. The demands on his time were often crushing, especially since annual bouts of flu in the 1890s left him debilitated for months. He explained to Weldon his application in 1898 for a post at Oxford in terms of his need to escape "influenza and engineering students!" Think of my lot, he lamented two years later, "having to teach 60 lads what they don't want to know! . . . I have to struggle & struggle with lads who take the first opportunity to cut my classes for good on the ground that they are of no 'use' to their profession, while I know that what they want is a thorough birching, and a demonstration that the glove-stretcher applied to their atrophied brains will be worth more to them in the future than any 'practical' facts." It was essential, however, to keep his student numbers up, and on this account he declined at least two opportunities to deliver prestigious lectures in the United States.[23]

He felt greatly relieved when a grant from the Worshipful Company of Drapers in 1903, and later a bequest from Francis Galton, enabled him gradually to unload this burden. It was not only the demands on his time, eleven hours of weekly lecturing when he first assumed the Goldsmid chair in 1884, increasing to sixteen hours by 1897, plus the job of coordinating the work of his demonstrators.[24] What vexed him most was the indiffer-

[21] KP to Egon P, 25 March 1905, Pearson Papers 923/2.

[22] From a letter, date not given, in E. S. Pearson, *Karl Pearson,* 16, 31–32.

[23] KP to Weldon, 3 Aug. 1898 and 13 July 1900; KP to Simon Newcomb, 26 June 1903, Newcomb Papers at Library of Congress (I thank David Grier for referring me to these letters); on his frustrated plans to give the 1901 Lowell lectures at Harvard, canceled when his colleague Hudson Beare accepted a chair in Edinburgh, see B. O. Peirce to KP, 28 June 1902, Pearson Papers 813/5; KP to Charles Davenport, 1 March and 23 June 1901, Davenport Papers, American Philosophical Society; KP to Galton, 22 Oct. 1901, Galton Papers 293/E.

[24] Thomas Hudson Beare to KP, 18 Dec. 1890, Pearson Papers 631/9; Magnello, "Non-Correlation of Biometrics and Eugenics," 87.

ence of so many students to the scientific spirit, their rudimentary command of mathematics and lack of desire for more.

Although few articulated their ideals so clearly or took them so seriously, Pearson's dilemma as a teacher was a familiar one in the late nineteenth century. At his summer retreat in Saig, he found sympathy from his friend Egon Zöller, who was able to satisfy Pearson's renewed interest in German university developments. A disciple of Swedish theistic neoidealism, Zöller imported some of his philosophical concern about the wholeness and continuity of the self into his work on universities and technical institutes (*technische Hochschulen*). The division between academic and technical institutions was unfortunate, he felt, both because it separated engineering from the sciences that nurtured its progress and because it deprived technical students of the *Bildung* that could form them into cultivated and moral beings. At a time when the standing of the technical colleges was under discussion in Germany, he favored their conversion into universities, so that the specialized knowledge of technical disciplines could be united to liberal education (*allgemeine Bildung*).[25]

The very possibility of turning technical colleges to universities, though hotly contested in the Germany of the academic mandarins, reveals how much they had changed from the mostly vocational schools of the early nineteenth century. "School culture" in engineering, hitherto linked more closely to the military and to state bureaucracy than to private industry, had spread widely on the European continent by about 1860. English industrialists and engineers, who had long been receptive to instruction on engines, measurement, and other directly practical subjects, tended more strongly to resist formal schooling in theoretical science.

Kennedy and Pearson were at the forefront of a gradual transformation of the engineering curriculum, partly on Continental models, and the laboratory was not such an alien space for their students as was advanced mathematics. The abstract forms of analysis adapted by Cambridge mathematicians from mainly French sources, which Kennedy regarded as outside his own competence, had little promise for teaching students such as these. Even on the Continent, serious mathematics was hard to sell to the sons of workers and artisans who looked to move up in the world by becoming engineers, or to the industrialists who would employ them. The

[25] Egon Zöller, *Die Universitäten und technischen Hochschulen: ihre geschichtliche Entwickelung und ihre Bedeutung in der Kultur, ihre gegenseitige Stellung und weitere Ausbildung* (Berlin: Verlag von Wilhelm Ernst & Sohn, 1891). Most of his published work was about Swedish theistic philosophy, particularly that of Christopher Jacob Boström, and he praised the strong but balanced sense of individuality in Sweden, by contrast to the excessive subjectivism, going over to *Schwärmerei,* in Germany. Among his books are *Schweden, Land und Volk. Schilderungen aus seiner Natur, seinem geistigen und wirthschaftlichen Leben* (Lindau and Leipzig: Verlag von Wilh. Ludwig's Buchhandlung, 1882) and *Der Gottesbegriff in der neueren schwedischen Philosophie* (Halle: C.E.M. Pfeffer, 1887).

mathematical textbook written by John Perry for students at the first technical college in England, at Finsbury, taught decimals, approximations, log tables, slide rules, and the representation of simple mathematical functions on squared graph paper.[26]

The teachers at these English colleges prided themselves on the instruction in engineering, not physics, that they provided their students, and even boasted of its greater practicality than was customary in France or Germany. The administrators who presided over them were still less likely to endorse a demanding mathematical curriculum. For decades, British scientists had complained of employers who expected schools and colleges to shoulder the expense of inculcating techniques of the trades. They contrasted the English situation with that in Germany and America, where industrialists appreciated the value of a science-based technical education. It was a difficult battle when most public rhetoric on behalf of science in England stressed its directly utilitarian rather than its broad educational function. Pearson and others argued that even for its practical value, science depended on a base of theoretical understanding and pure research. But who was listening? In 1896, when he put out feelers about a mathematical post at the Royal College of Science, Olaus Henrici told him his chances were poor, "given the peculiar circumstances" of the institution. "Mathematics has been sadly neglected and 'practical' men have had everything in their hands." Probably the school would choose Perry, Henrici continued, and even this appointment would be a step forward for engineering mathematics.[27]

Pearson wanted nothing to do with a program of mathematical instruction limited to arithmetic procedures. Fortunately, mathematicians on the Continent had already confronted more or less the same problem and had explored some solutions. The most promising, at least to Pearson, was known as graphical calculation or, in its most dignified and mathematical form, graphical statics. More than a mode of representation, it was a geometrical means of solving problems. For a directly practical question, as in construction, one might sketch a bridge or building, representing forces by vectors, and calculate geometrically the stresses and strains. This is just what the most celebrated treatises on the subject, those in particular that Pearson admired, declined to emphasize. Instead, they proceeded systematically and mathematically. They began with demonstrations of how to

[26] Ringer, *Decline of the German Mandarins;* Lundgreen, "Engineering Education in Europe and the U.S.A., 1750-1930"; Kennedy to KP, 27 Nov. 1911, Pearson Papers 11/10; Brock, "Building England's First Technical College"; Alter, *Reluctant Patron,* 169.

[27] Gooday, "Teaching Telegraphy and Electrotechnics"; MacLeod, "Education: Scientific and Technical"; Alter, *Reluctant Patron,* 119–126, 151; Olaus Henrici to KP, 25 Feb. and 27 Feb. 1896, Pearson Papers 717/4.

perform the basic arithmetic operations with vectors, including division and the extraction of roots, and proceeded to graphical methods for solving numerical equations. Sometimes they included applications to physics, particularly to Pearson's own specialty, the theory of elasticity. Calculations of specifically engineering quantities, such as stress and torque, might be put off to the end or to a second volume, and issues associated with particular kinds of structures were commonly omitted entirely.

The origins of graphical statics can be traced to the work of French engineers after the Revolution, particularly to J. V. Poncelet. In France, however, the gulf between the extremely elite Ecole Polytechnique, which dealt mainly in higher analysis, and other schools of engineering was too wide to nurture this form of mathematics, and from mid-century it was practiced principally in German and Italian states. The pioneering text in what promised for a time to be the triumphant career of this mathematical science was published in 1866 by a Swiss railway engineer, Carl Culmann, who had taken a position at the new Eidgenössiche Polytechnikum (subsequently the Eidgenössische Technische Hochschule) in Zurich. He emphasized above all the value of his subject for the formation (*Bildung*) of engineers. It is not enough, he explained, to supply the *Techniker* with rules and formulas he will apply as recipes for construction. Instead, the technical instructor aspires to form *thinking persons,* who will grasp their projects spatially and mathematically. In terms of the values of education, it was important that these geometrical methods represented the problem clearly to the mind, and held it there through the operations of its solution. Culmann argued that the most modern analytic methods shared with this graphical geometry the advantage of unmediated directness, but that algebra demanded mathematical preparation beyond what the students possessed.[28]

The educational philosophy of graphical statics was defended more forcefully in the preface to a textbook by Antonio Favaro, professor at the University of Padua. First published in 1877, it then appeared in 1879 in a French translation that the author called superior to the Italian original. Analysis and geometry, he explained, had been in competition as approaches to mathematics since at least the time of Viète and Descartes. While he did not expect a definitive resolution, there was no doubt that geometry was gaining favor among those most devoted to the "culture of mathematics." The very power of analysis as a means to solve problems compromises its effectiveness "as an instrument of intellectual culture." Its procedures are almost mechanical, and in this labyrinth of formulas the

[28] Scholz, "Graphical Statics"; Maurer, *Karl Culmann;* Tournès, "Pour une histoire du calcul graphique"; Carl Culmann, *Die graphische Statik* (1866), 2 vols., 2d ed. (Zurich: Meyer & Zeller, 1875), preface to 2d ed., v, xi.

mind quickly loses sight of the magnitudes with which it is dealing. Geometry, by contrast, advances with complete clarity, the problem always before the eye, and the solution it eventually discovers will appear in the simplest and most attractive form.[29]

Such praise of clear demonstration had been familiar in England in mid-century, prior to the triumph of the analytical style of which Pearson increasingly complained. The great champion of classical geometry was William Whewell, master of Trinity College, who defended it as a "permanent" study akin to Greek and Latin, one ideally suited to "educe" the higher faculties of reason and language. Algebra, by contrast, was "progressive," and if it was indispensable for the professional education of mathematicians, it was much less suited to forming the mind. Engineering could be part of a liberal education, and Whewell pushed to incorporate it into the curriculum in the form of Poncelet's projective geometry.[30] Favaro, too, looked to Poncelet as a predecessor, but with reservations, since Poncelet's methods were not yet graphical. If some opposed this new geometry as "too exclusively manual," Favaro argued, they had simply failed to comprehend its virtues as mathematics. Here at last was the "royal road" to mathematical competence that Euclid had denied the monarch Ptolemy. Although graphical statics was a happy result of the reciprocal influences of geometrical theory and practical demands, the pursuit of immediate applications would be contrary to the spirit of mathematics. "To separate graphical statics from its loftiest rational origins would be to close every path of progress for this new branch of applied science, and to misunderstand the essential principles of higher education."[31]

The brief efflorescence of graphical statics in England was part of an effort to raise the mathematical level of engineering education. For more than a decade it was Pearson's central contribution to the curriculum at University College. With Favaro and Culmann, he valued it for the mathematical virtues of power and generality, and he refused to reduce it to a miscellany of techniques for solving practical problems. He had no patience for such textbooks as that of Robert Smith, professor at Mason College, Birmingham, and author of such works as *Cutting Tools Worked by Hand and Machine,* whose authorial role it had been to adapt the mathematics "to the needs of the engineering student who wishes to fit himself for the use of the method in business practice." Pearson complained that Smith lacked sufficient familiarity with the Continental literature to avoid

[29] Antonio Favaro, *Leçons de statique graphique. Première partie. Géométrie de position,* trans. from Italian by Paul Terrier (Paris: Gauthier-Villars, 1879), preface, v–vi.

[30] William Whewell, *Of a Liberal Education* (London, 1845); see Richards, *Mathematical Visions,* 18–29; Smith and Wise, *Energy and Empire,* 58–65.

[31] Favaro, *Leçons de statique graphique,* vii, xii, xxxii.

clumsy and inelegant formulations.[32] In 1890, the year after Smith's book, there appeared an English translation of two short treatises by Luigi Cremona, one introducing the methods of graphical calculation, and the other explicating the only important English contribution to the topic, which derived from a paper by Maxwell on reciprocal figures. The translator, Thomas Hudson Beare, had been asked to undertake the work by his colleagues Kennedy and Pearson.[33]

By this time, graphical methods were on the agenda of scientific and technical education. The British Association formed a committee in 1889 to report "on the development of graphic methods in mechanical science." Some disagreement on the relative merits of general mathematics and handy quantitative techniques can be discerned in the report, though the committee held that "this difference of opinion is apparent, and not real." Even tasks that seemed quite untheoretical, such as interpolation, cannot be automatic but require instruction. Some members considered that Cremona was too much preoccupied with "purely geometrical methods." The committee was concerned, in an era of rising fear of German research and German industry, that Britain had fallen behind in this important technical field. Its importance in Continental engineering schools, the committee thought, owes much "to the fact that it affords a high mental training in geometry, which has at the same time direct practical value." It recommended that every English engineering school should offer a course of about ten one-hour lectures on graphical methods.[34]

Pearson's ambitions went much further than this recommendation. In practical terms—and he was not indifferent to these—a skilled draftsman could solve problems with errors of only 1 or 2 percent, better accuracy than most measures of physical properties that concerned engineering. Graphical statics provided the basis for a powerful and flexible mathematical training, since there "are very few processes of Pure Mathematics which have not their analogies in Pure Graphics," and indeed "much can be done that is beyond the reach of analysis." He thought it a historic moment in the progress of mathematics. A quarter of a millennium earlier, Descartes had developed analytic methods that could subsume geometry, so that Newton had in a way been the last great geometer. Graphical

[32] Robert H. Smith, *Graphics or the Art of Calculation by Drawing Lines* (London: Longmans, Green, 1889), 1; Pearson, unsigned review of Smith's book in *The Academy,* 35 (1889), 397–398.

[33] Luigi Cremona, *Graphical Statics: Two Treatises on the Graphical Calculus,* trans. Thomas Hudson Beare (Oxford: Clarendon Press, 1890).

[34] See reports of the committee on "the Development of Graphic Methods in Mechanical Science," in *British Association Reports,* 59th meeting (1889; published 1890), 322–327; 60th meeting (1890), 373–531; 61st meeting (1891), 573–613, quotes on 609, 423, 385.

methods were about to restore the priority of geometry. Not only could numbers and functions now be represented on paper, but one could perform operations on them and find solutions. New forms of visual representation were joined to a powerful set of mathematical tools that promised to make the manipulation of clouds of symbols increasingly otiose.[35]

Such a transformation was of particularly great significance for mathematical education, since "form and figure are more easily realizable by the average mind than symbol and numeric quantity." Graphical geometry could even, perhaps, reunite theory and practice, Pearson's great desideratum, and make plain the practical significance of mathematics. Let the motto of technical education, he proposed in his first Gresham lecture, be: "Practice enlightened by theory, theory guided by practical needs." Alas, it was instead the sad plight of teachers of geometry to be caught between rival ideals. On the one side were recondite research papers, lying unread; on the other, "the listless student, bent on struggling through life with the least expenditure of intellectual energy," always wanting immediate uses and caring nothing for real understanding. "The introduction of theory into engineering practice has been largely due to the progress of modern geometry and the geometrical methods of calculation." Here was a suitable mission for Karl Pearson. As late as 1895, when in retrospect he seems to have been fully immersed in his pioneering statistical efforts, he was still planning to incorporate the statistics into a general work on "the whole field of graphics."[36]

This graphical vision, for engineering and simultaneously for statistics, was not exclusively a response to the needs of engineering students. Arthur in *The New Werther* had yearned to see and feel nature directly; the *Grammar of Science* was torn between positivist detachment and a longing to make science consistent with feeling at home in the world. Graphical geometry was comfortably intuitive and visual, making it more accessible to learners, but also permitting the mind of the scientist to maintain contact with his objects of study. As it happened, the moment of graphical geometry in engineering was a brief one; graphical calculation did not achieve a success parallel to that of graphical representation. But at the moment Pearson took up statistics as a topic of investigation, he was entranced by the power of graphs, and under their sign his statistical program was conceived. In June of 1893, when he hired Udny Yule as

[35] Pearson, unsigned review of Smith, *Graphics* (1889); Pearson manuscript, Gresham lectures on "The Geometry of Statistics" (1891–92), Pearson Papers 49, folder 1.

[36] Pearson, "The Applications of Geometry to Practical Life," *Nature,* 43 (22 Jan. 1891), 273–276, on 273; Pearson's testimonials for Gresham professorship, Nov. 1890, Pearson Papers 11/9; Olaus Henrici to KP, 9 Oct. and 14 Oct. 1895, Pearson Papers 717/4.

assistant for his drawing class, he asked him also to help with "the preparation of specimen drawings for a treatise on graphics, which I have in the stocks." Immediately he began giving Yule frequency distributions to calculate and statistical data to plot. Soon Yule was ordering machines for the job and then inventing his own. For the first few years, Pearson's statistical ambitions were encompassed within his program for graphical statics.[37]

The Geometry of Statistics

Already in his first Gresham lecture, his job talk, he had proposed statistics as an important field for the practice of graphical method. Gresham College, after all, was located in the City, the financial center of London and the world. Referring, most likely, to Alfred Marshall's *Principles of Economics* (1890), he reflected that "the theory of prices has become almost a branch of applied geometry," and he was properly impressed by the luxuriant graphical albums of trade statistics then issued annually by the French government.[38] His first regular Gresham lectures made up *The Grammar of Science,* but in the fall of 1891 he began three years of courses on chance and statistics, delivering a total of thirty lectures, all but the last two given in runs of four lectures on consecutive days in November, January or February, and April or May. With a few apparent exceptions, he did not repeat himself, and every lecture involved original work, or at least an original synthesis, which yet had to be accessible to a general audience. The focus on the visual, supported by a collection of lantern slides, helped to make the lectures work, as did bold pedagogical stunts such as dispersing thousands of pennies to be sorted and tallied. Given the ambition of his lectures, he was remarkably successful, at the cost of much labor that had to be squeezed into evenings or completed during vacations. A month before his first lecture series, in October 1891, he told his wife that he was "simply a machine this week & till you come back again,—getting Statistics on the brain now instead of consciousness." "What one feels is what one sleeps & dreams changes from consciousness to statistics only too readily."[39]

The crucial stimulation to Pearson's statistical program provided by interactions with Weldon has been properly stressed in the scholarship, but

[37] KP to Yule, 5 June 1893, 20 Oct. 1893, 8 June 1894; Yule to KP, 7 Jan. 1894 and other letters from 1894, Pearson Papers 931 and 905.

[38] Pearson, "Applications of Geometry"; on French graphs, see Palsky, *Des Chiffres et des cartes.*

[39] The syllabi for these lectures are printed in E. S. Pearson, *Karl Pearson,* 142–153; see also Magnello, "Pearson's Gresham Lectures." Quotes from KP to MSP, 17 Oct. and 19 Oct. 1891.

we should note that his first serious involvement with statistics had little or nothing to do with Weldon or Galton. Instead, it flowed from his role as a teacher of engineers and his deep commitment to the integration of mathematics and science into practical and public life. His sources included the basic literature of mathematical probability, but above all official statistical albums and other sources on graphical method. He was also familiar with the growing use of graphs, usually time series, in English empirical economics to assess, for example, whether changes in the marriage rate might be driven by levels of trade or of general prosperity. The most prominent source in English for such methods was a jubilee conference celebrating the fiftieth anniversary of the (soon to be "Royal") Statistical Society in 1885. The afternoon of 23 June had been largely devoted to statistical graphics. Although Pearson was not in attendance, he studied the resulting volume. One paper, by Marshall, proposed an internationally standardized graphical format for all kinds of economic and social data. With years arrayed in a fixed position along one axis, proportional rather than absolute units on the other, and bar graphs five millimeters wide conveying the data, statisticians and economists could survey comparative data systematically and uncover potential causal relationships by eye.[40]

A survey of modes of graphical representation by Emile Levasseur in the same volume may well have guided the initial investigations for Pearson's first series of statistical lectures in 1891–1892 on "the geometry of statistics." He there surveyed and introduced a typology of the various modes of representing data visually, whether by points, lines, areas, or volumes, using rectangles, circles, or contour intervals. Their names, including some neologisms, were based on Greek roots: stigmograms, euthygrams, epipedograms, histograms, diagrams, radiograms, hormograms, chartograms, topograms, and stereograms. Mostly he seemed to be concerned with accurate and graspable presentation, though he did discuss the "discovery of laws from curved diagrams." Against the German statistician Georg von Mayr, who thought graphs were mere instruments for popularizing statistics, he sided with a mostly French tradition represented by Emile Cheysson and Etienne-Jules Marey. They held that statistical graphs involved a special language of powerful intuitive clarity, which could be made into an instrument of research. Pearson praised them effusively, invoking both men in support of an argument that embodied his own ambitions for graphical statics. "Geometry is not merely a mode or representing research, *but it is essentially a mode of statistical research. . . . Most statistical conclusions which can be obtained by arithmetic, can be ob-*

[40] Alfred Marshall, "On the Graphic Method of Statistics," in *Jubilee Volume of the Royal Statistical Society* (London: Edward Stanford, 1885), 251–260; Morgan, "Searching for Causal Relations."

tained also by geometry, and many conclusions can be formed which it would be difficult to reach except by geometry."[41]

Following the logic of his own developing interests, he took "laws of chance" as the overarching theme of his lectures in the following year. As in *The Grammar of Science,* he there characterized chance as the expression of human ignorance rather than of any "free-will" in nature, a distinction that did not obviously make sense within the terms of this idealistic metaphysics. His focus, nevertheless, was highly empirical, and he introduced the basic concepts and mathematics of the subject using various forms of experience and "experiment" such as coin tosses and tables of roulette numbers from Monte Carlo. The latter inspired him to carry out a statistical test, framed by a concept for which Pearson had recently coined a name, "standard deviation," measure of the width of a distribution.[42]

The third year of lectures, delivered in 1893 and 1894 during the period of his increasingly intense evolutionary discussions with Weldon, reveal concretely the crystallization of his statistical vision. He continued to emphasize the graphical, visual aspect of statistics. The connection to biology depended on a quite traditional assumption of the "normal curve of frequency," on which Adolphe Quetelet and then Francis Galton had relied.[43] By 1893, however, Pearson was most interested in departures from normality, and he imagined in his lectures how the bell-shaped distribution of a fishmonger's wares might be transformed by evening into a double-humped curve, if his customers strongly preferred fish close to the average size. Here he was taking a leaf from Darwin, using artificial selection to help imagine the effects of natural selection, and he was already thinking of Weldon's conjecture that measurements of some crabs he had been studying showed incipient speciation.

As the lectures proceeded, Pearson became more and more convinced of the importance of irregularities in the curves. His lecture notes convey a sense of excitement and discovery, stimulating thoughts that went well beyond what was adumbrated in the syllabi. "I have endeavoured to give you something fresh & new," he told his audience by way of summing up,

[41] Emile Levasseur, "La Statistique graphique," in *Jubilee Volume,* 218-250; E. J. Marey, *La Méthode graphique dans les sciences experimentales,* 2d printing (Paris: G. Masson, 1885), vi; Pearson, "Geometry of Statistics," Pearson Papers 49, folder 1. On Marey, see Frank, "The Telltale Heart"; Daston and Galison, "Image of Objectivity." On Pearson's graphical Gresham lectures, see Klein, *Statistical Visions in Time,* 17–19.

[42] The syllabi have been printed as Appendix II to E. S. Pearson, *Karl Pearson,* 142–153. For Pearson's lecture notes, see Pearson Papers 49, and also "Lecture II. Chance and Ignorance," filed in Pearson Papers 67; "The Scientific Aspect of Monte Carlo Roulette" (1894), in Pearson, *Chances of Death,* vol. 1, 42–62.

[43] Stigler, *History of Statistics,* 335; Porter, *Rise of Statistical Thinking,* part 2.

"not old & stale products of other men's writings, but something which should be new not only in Gresham College, but outside it." A vision was taking form, even as he wrote his lectures, that evolution by natural selection could be comprehended statistically. Pearson's enthusiasm, as he imagined a new scientific reformation, shines through on every page. "We are living in an essentially critical period of science, when more exact methods & more sound logic" were replacing the old "scientific gospel." "For the first time in the history of biology, there is a chance of the science of life becoming an exact, a mathematical science. Men are approaching the questions of heredity & evolution from a new standpoint."[44]

The key, Weldon's insight, was to look for departures from normality in large collections of data. A simple rule governed the interpretation of these distributions. The normal distribution implied an absence of selective pressure, or evolutionary stasis. At one point he seems even to have worried that if Weldon's irregular curve could successfully be divided into two or more normal curves, it would undercut any argument for evolutionary pressures. Irregular curves, departures from the simple symmetry of the normal, were the signs of evolutionary change, now conceived unmistakably as a statistical problem with a statistical solution. As soon as he found that a skew curve fit biological measures better than the symmetrical normal, he concluded that evolution was at work: "In other words from my standpoint there is a change going on in the organ measured, even if it be but a *very* slight one." In his Gresham lectures, Pearson offered the example of the lengths of wings within a population of a thousand swallows. "We want to know whether the distribution is a normal one,—a pure chance distribution or whether we have an abnormal curve and something which suggests a tendency to deviate more in excess or defect of the mean. We want shortly to know whether evolution is at work *now* & to *what extent*."[45]

These lines probably date from late 1893, when he made similar arguments in a Gresham lecture on frequency curves and in a manuscript submitted to the Royal Society.[46] His syllabus for the four lectures in November 1893 proceeds systematically from normal curves to skew curves and compound curves, offering abundant examples from work in many fields by a variety of authors. Some of these topics are repeated in his schedule for the winter lectures, from 30 January to 2 February 1894,

[44] Pearson Papers 49, folder 2, final quote from a file without a lecture number, labeled by Pearson "Notes."

[45] Weldon to KP, 22 June 1893, Pearson Papers 891; KP to Galton, 17 Nov. 1893, Galton Papers 293/A; Gresham lectures in Pearson Papers 49, folder 2, "Notes."

[46] See George Darwin's report on a Pearson manuscript, 9 Nov. 1893, RR 12.11, Royal Society Library. Darwin discerned Pearson's assumption that the normal curve implies evolutionary stability and asked for biological evidence.

suggesting that he may not have been able to cover all the topics he had listed for November. For the last of these, on 2 February, he promised to address the crucial topic of "Evolution in Man," using measurements of schoolchildren and of skulls from old German graves as his data. With numbers and graphs he believed that he could detect the separation and mixing of races and varieties, and the pressures of natural selection. For the Gresham lecturer, the statistical study of evolution was first of all visual and graphical.[47]

Inspection and Analysis

This visual sense was important also for Pearson's new mathematical research program into problems of evolution and statistics. It took the form of a preoccupation with frequency distributions. But the eye alone was not sufficiently discerning to reach determinations on the vital questions of science with which he was now concerned. His first important research paper on this new topic concerned the problem that Weldon had brought to him, probably the subject of many conversations between the two men over lunch at University College, the quantitative evidence of speciation in Naples crabs. The not-quite-raw data took the form of a line graph that rose jaggedly to a single peak, then fell off steeply, subdividing a thousand crabs according to the ratio of breadth of forehead to body length. Weldon, who had been converted to statistics by Galton's *Natural Inheritance,* was surprised by the pronounced departure from normality and suspected that the asymmetry of the curve might indicate a heterogeneous population If so, it could presumably be broken down into its homogeneous elements by splitting it into two normal curves, and in November 1892 he informed Pearson of his success in subdividing a double-humped curve of crustacean measurements. Pearson, suspecting that so important a problem would repay a serious mathematical treatment, undertook with the Naples crabs to go beyond the biologist's makeshift procedures, to identify some kind of optimum solution and to establish criteria for deciding what it might mean.[48]

It was not an elegant business, but it was amenable to some of the techniques Pearson knew from his work in applied mathematics. From the beginning of his statistical career, and even before that, he fit curves using

[47] E. S. Pearson, Karl *Pearson,* 150–153.

[48] W.F.R. Weldon to KP, 17 Nov. 1892, Pearson Papers 891; Pearson, "Contribution to the Mathematical Theory of Evolution," *Philosophical Transactions of the Royal Society of London, Series A,* vol. 185 (1894), 71–110; citations from reprint in Karl Pearson, *Early Statistical Papers* (Cambridge: Cambridge University Press, 1948), 1–40.

the "method of moments." In mechanics, this meant matching a complicated body to a simple or abstract one that had the same center of mass and "swing radius," respectively the first and second moments. These quantities corresponded in statistics to the mean and the spread or dispersion of measurements around the mean. Higher moments, for example the third, were found by multiplying the number of crabs at every point on the graph by the third power of the distance from the mean, and adding all these quantities together. Since Pearson dealt in discrete measurement intervals, this was a sum rather than an integral. He was seeking a combination of two normal curves whose first five moments matched those of the original line graph. The textbooks of graphical statics provided methods of construction so that the moments could be read off a curve to an accuracy of one percent by "a good draughtsman" using a planimeter. But finding a sum of normal curves with five specified moments was beyond the reach of graphical methods. Pearson set up these five equalities as a system of equations, which combined into one of the ninth degree. A numerical solution was only possible by successive approximations. There could have been as many as nine real solutions, though in the present instance there were only two. He graphed both results alongside the original, and was generally pleased with the appearance of the result. He did not, however, rely on visual inspection to decide between them, but calculated the sixth moment to decide the best match.[49]

There remained a question of interpretation. Weldon, in his publication based on these data, accepted the validity of Pearson's curve-splitting results, but was cautious with claims about biological meaning, merely asserting that the frontal breadth was "slightly dimorphic."[50] Pearson, by contrast, wanted evidence of the origin of species. If, he supposed, this were simply a heterogeneous population, an indiscriminate mixture of different types, then they would presumably differ in other traits as well. By contrast, a divergence of this one measure alone would indicate a process of incipient speciation. To perform the test, he tried to dissect one of Weldon's most symmetrical curves from measures of a different organ in the same Naples crabs, to see whether it could be split into subpopulations corresponding to those of the forehead index.

The result was negative, implying, by Pearson's somewhat murky reasoning, that distinct types had arisen within a single population. This important result, as he considered it, was a triumph of algebraic manipulation. Any "judging of symmetry by the eye is very likely to be fallacious,"

[49] Pearson, "Contribution to the Mathematical Theory of Evolution," graphical methods on 9; also Culmann, *Graphische Statik,* 392ff.

[50] W.F.R. Weldon, "On Certain Correlated Variations in *Carcinus moenas,*" *Proceedings of the Royal Society of London,* 54 (1893), 318–329, on 324.

he warned. In seeking to determine whether a graph reveals homogeneous material, to rely on "the judgment of the eye" is almost certainly defective.[51] Pearson put his faith now in algebra, a labyrinth of calculations. It was the kind of mathematics he had recently set himself against when vaunting the merits of graphical statics. It did not make visible the physical or biological problem, but circumvented the senses. He also tended to ignore everything else that was known about the organisms measured, even if clearly relevant, such as breakage and regeneration that might explain a few outlying crab measurements. If Pearson was troubled by the detachment of his mathematics from ordinary experience, he did not let on. Weldon, however, found Pearson the "pure mathematician" quite vexing, sometimes for just such reasons, and even Galton doubted the reliability of his curve-splitting.[52]

In one important sense Pearson was anything but a pure mathematician. He was interested in mathematics as a tool for comprehending the natural world and altering the social one, and he almost never did mathematics without putting it to use by confronting it with scientific data. But sometimes he willingly isolated himself, as in the allegorical telephone exchange of *The Grammar of Science,* and blocked out everything one might know of the world except measurements. To be sure, there were satisfactions to be found even within the windowless box. In 1894 Yule discovered for him the possibilities of the Brunsviga calculator, a "brain of steel" *(Gehirn von Stahl)*, according to advertisements sent out by its German manufacturer, and of epochal significance for Pearson. Thereafter, he kept his always at his side and was often photographed with it. He envisioned for it a glorious future, the computer that was to come, growing from the historic contributions of the pioneers of calculation. Those "little men" who thought Napier had become irrelevant, he explained, failed to comprehend "that when mechanical knowledge is so far advanced that setting a number on to a machine will record its logarithm, then one turn of the handle will replace their forty turns." In the meantime, he employed—or more often accepted the volunteer labor of—dozens of "computers," but he held strictly to the moral principle that nobody was exempt from the work of calculation. "What happens to a biometrician when he employs another to do his computing? He becomes a parasite, who has lost touch with his material." Pearson's instrument kept him in touch.[53]

[51] Pearson, "Contribution to the Mathematical Theory" (see note 48), 27, 29.

[52] See letter by Weldon, 6 March 1895, quoted in Stigler, *History of Statistics,* 337–338; Galton to Pearson, 25 Nov. 1893, Galton Papers 245/18A, quoted in Porter, *Rise of Statistical Thinking,* 299.

[53] Olaus Henrici to KP, 18 June 1894, Pearson Papers 717/4; Pearson, "W.F.R. Weldon," 18, 41n; Pearson, *Francis Galton: A Centenary Appreciation* (1922), 6; KP to Miriam Louise Tildesley, 29 Nov. 1930, Pearson Papers 929.

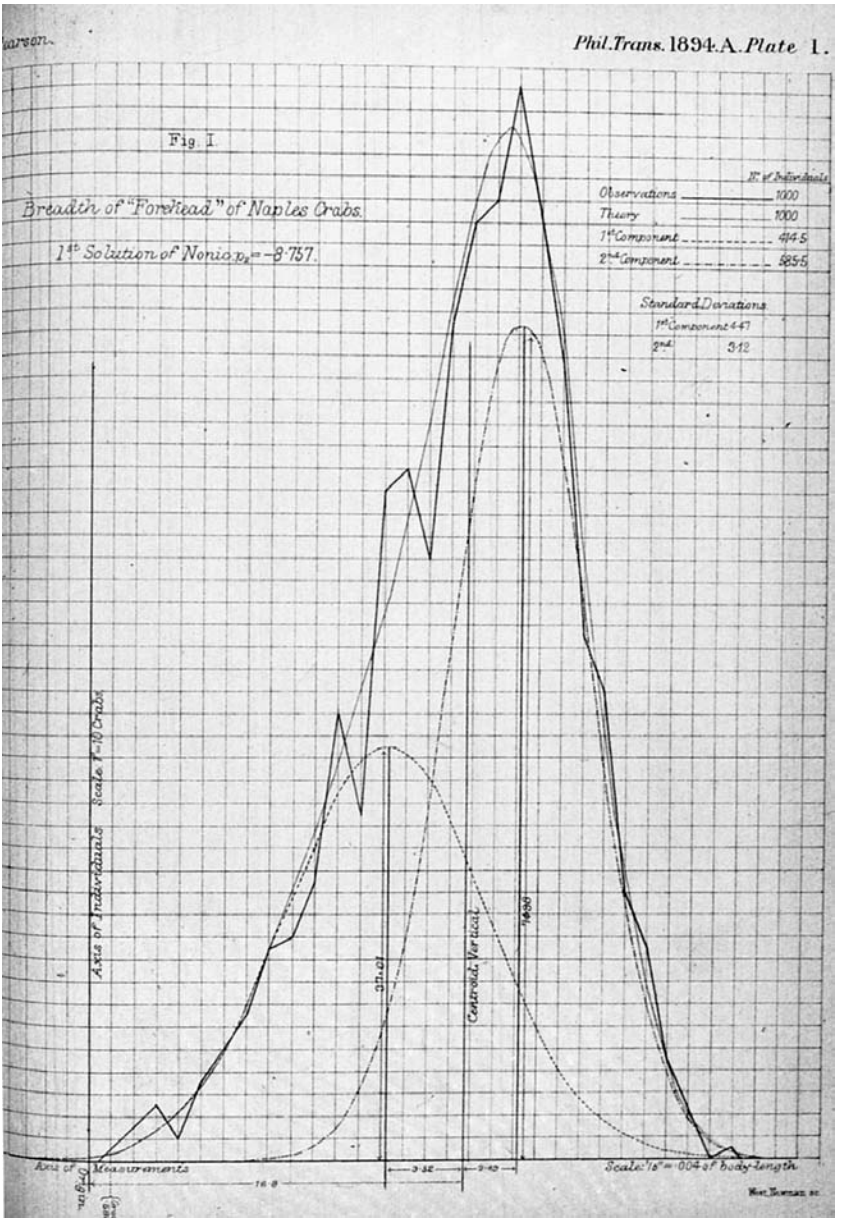

Figure 13. Decomposing a jagged figure into two normal curves. (From *Philosophical Transactions of the Royal Society of London*, series A, vol. 185, 1894.

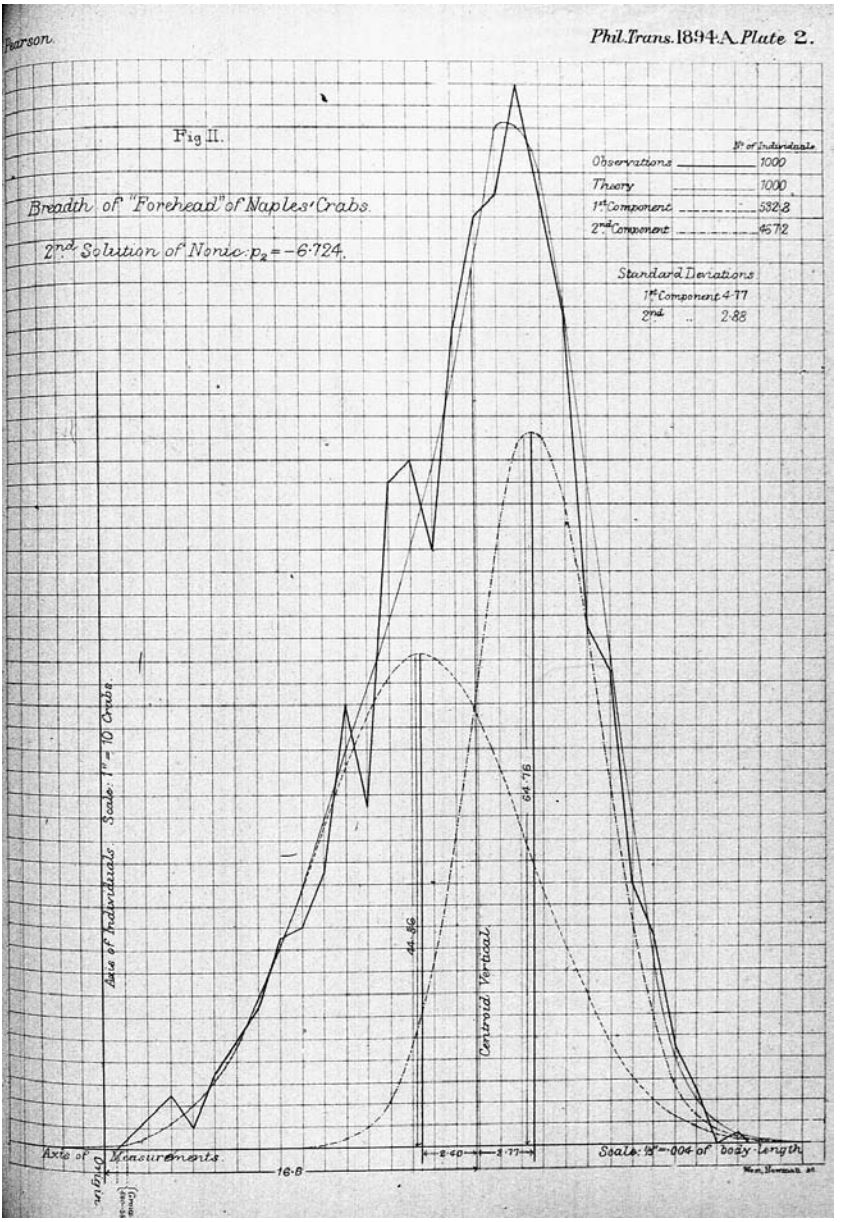
Fig II.
Breadth of "Forehead" of Naples Crabs.
2nd Solution of Nonic: $p_2 = .6724$.
№ of Individuals
Observations ____ 1000
Theory ____ 1000
1st Component ____ 532.8
2nd Component ____ 467.2
Standard Deviations
1st Component 4·77
2nd .. 2·88
Axis of Individuals. Scale: 1" = 10 Crabs.
44·86
64·76
Centroid Vertical.
Axis of Measurements.
16·8
2·60
2·77
Scale: ½" = ·004 of Body-Length.

His long memoir on skew distributions, published near the beginning of his statistical career in 1895, was among those he wrote as if from a closed world containing no objects but only quantities. The paper had two parts, of which the second showed how well his family of curves could fit data of all sorts, including meteorological, anthropometric, biometric, psychological, social, and economic. What did the phenomenon of divorce as a function of duration of marriage or the distribution of the values of houses have to do with barometric readings, the cephalic index of Bavarians, or the number of projecting blossoms in clover? "We are really quite ignorant as to the nature of the 'causes' in biological, physical, or economic frequency curves." Pearson claimed nothing, beyond the numbers. Even a solution implying probability values that were greater than one, negative, or imaginary left him unperturbed—or rather, triumphant: "Even if our binomial constants have unintelligible values, yet our method will give, in many cases, a closely-fitting polygonal figure." And, in general: "As the great and only true test of the normal curve is: Does it really fit observations and measurements of a symmetrical kind? so the best argument for the generalised probability curve is that it does fit, and fit surprisingly accurately observations of an asymmetrical character."[54]

This preoccupation with the fit of curves and indifference to causes provoked Edgeworth to include some critical remarks in a review of Pearson's new work. Pearson knew Edgeworth, by then the Oxford professor of economics, as a fellow Hampstead intellectual, and also as one of his most important predecessors and peers in probability and statistics. In 1891–92, the two had corresponded about graphical representations and mathematics in political economy. In 1895, Edgeworth wrote appreciatively of the wonderful fit of Pearson's curves to his data, but wondered if this proved anything about the world. With puckish wit, he asked if they had any more validity than the schoolboy's derivation of *virago* from *vir* (man) and *ago* (I lead), a perfect match but defying the etymological intuition one develops through study.

When Pearson responded angrily, Edgeworth tried to back down wherever he could. He conceded his own lack of insight on the difficulties of curve-fitting, and called on Pearson's expertise to decide whether "it might be possible to get good fits with other kinds of curves, having four constants at one's disposal." What most bothered him about Pearson's curves was just what Pearson had dismissed, a consonance of mathematics with the causes of the thing. Laplace's old derivation of the normal "law of errors" in terms of the action of many small variable causes made phys-

[54] Pearson, "Contributions to the Mathematical Theory of Evolution .—II. Skew Variation in Homogeneous Material," *Phil. Trans.* (1895), reprinted in Pearson, *Early Statistical Papers,* 41–112, on 56, 52, 43.

ical sense as the basis for many applications of the normal curve. But the chance arrangements assumed by Pearson as the basis of his derivations, involving for example the random placing of cards in a book, were physically implausible and gave no insight into the reasons for asymmetry in the rate of divorce as a function of years of marriage. Despite his careful deference in response to Pearson's wrath, Edgeworth insisted on the crucial point of difference. "[C]loseness of fit without a priori justification is not enough." This was John Stuart Mill's "verification without deduction," which counted for little. Edgeworth wanted a rationale for assigning a particular type of curve, and Pearson, whose letters to him have not survived, seems to have denied that this was important or even meaningful.[55]

Since all kinds of "conceptual" entities such as ether squirts, protyles, and, later, Mendelian genes were acceptable by the standard of *The Grammar of Science,* and since Pearson never hesitated in later like years to call attention to the inadequacies of "spurious" and other meaningless correlations, his refusal to consider the physical interpretation of his curves cannot simply be attributed to a general philosophical orientation. If positivism means refusing to look for causes or explanations, no working scientist could adhere consistently to it, and Pearson certainly did not. But he did sometimes invoke his philosophy as justification for not looking behind the numbers, and he nurtured a startling faith in the possibilities of a geometrical science of lines and curves. In this memoir he sought purely formal ways to discriminate between a "true curve of the skew type" and a compound curve or sum of curves, which would imply heterogeneity. The curves seemed to have a necessity of their own, as in one case of somewhat unsatisfactory fit in botany, where he mentioned the difficulties of measurement and argued that the curve was probably more accurate than the raw numbers.[56]

He continued, in fact, to nurture a vision of a graphical science of evolution. This was positivistic in the sense that it dispensed with any mechanism of hereditary transmission at the individual level,[57] but it was perfectly amenable to explanation in terms of the Darwinian mechanism of natural selection. He presented it most clearly in the two chapters he

[55] F. Y. Edgeworth, "On Some Recent Contributions to the Theory of Statistics," *Journal of the Royal Statistical Society,* 58 (1895), 506–515; Edgeworth to KP, 5–12 April 1891, 25–27 April 1892, 3–10 March 1895, Pearson Papers 681; see also Plackett, "Karl Pearson and the Chi-Squared Test"; Stigler, *History of Statistics,* 339. In 1896 Edgeworth asked Pearson to comment on Vilfredo Pareto's income curve in the *Economic Journal,* which Edgeworth edited. Pearson declined, but expressed a negative view of Pareto's graphics.

[56] Pearson, "Contributions, II. Skew Variation," 92, 101.

[57] See Pearson, "Mathematical Contributions to the Theory of Evolution.—III. Regression, Heredity, and Panmixia," *Phil. Trans.* (1896), reprinted in Pearson, *Early Statistical Papers,* 113–178, on 115.

added to the second edition of his *Grammar of Science,* appearing in 1900, which had a greater impact than the first, prestatistical edition. The process of evolutionary change was to be divided into three main elements. First was survival, or natural selection in the most literal sense. It could be represented and investigated according to a graphical logic. A frequency curve of some quantifiable character at an early phase of life should be set against the same curve later in life to determine how survival depended on this character. The researcher would have to correct for growth, among other complications. Evolution depended, next, on reproduction: In what regions of the curve were individuals most successful at finding mates and producing young? Finally, there was the problem of "inheritance," or heritability: What proportion of the exceptionality of parents was passed along to their offspring?[58]

This seemingly straightforward graphical procedure was complicated by the problem of correlations. A particular trait could not, in general, be treated in isolation, since what was favored directly might be weeded out due to strong correlations with disadvantageous traits. The selection of any particular organ was affected by the selection on correlated organs. On this account he worked to develop the mathematics of correlation surfaces, perhaps of many dimensions. These were not so easily represented on paper, and they stood in the way of a utopia of ready graphical solutions to evolutionary problems. Still, he assigned great significance to the graphs that accompanied most of his mathematical papers, investing much labor in the calculations and aggressively seeking out support to cover the added costs of printing. Even if graphical representation was not, after all, a royal road, he saw it as invaluable, and he remained convinced that evolution was a quantitative problem from beginning to end.[59]

From the standpoint of this program, it makes sense that he would have regarded empirical adequacy as the critical attribute of his frequency curves. Their purpose was not, at first, to be incorporated into the machinery of statistical inference but to work in a system of description and modeling. Although Pearson's statistical methods did not always hold the scientific problem in direct view, much of his mathematics was designed to preserve and emphasize a geometrical sense of curves and surfaces, sometimes—and as an old fourth-dimension man he quite liked this—in a "hyperspace" of higher dimensions. One occasion for his disputes with his student Yule was Yule's willingness to reduce to a line, to intercept and slope, what Pearson wanted to investigate as a complex geometrical form. For the same reason, he condemned the practice of reducing statistics for

[58] Pearson, *Grammar of Science,* 2d ed. (1900), chaps. 10 and 11.

[59] KP to Galton, 6 Dec. 1894, Galton Papers 293/A, and Galton to KP, 16 Dec. 1894, Galton papers 245/18A.

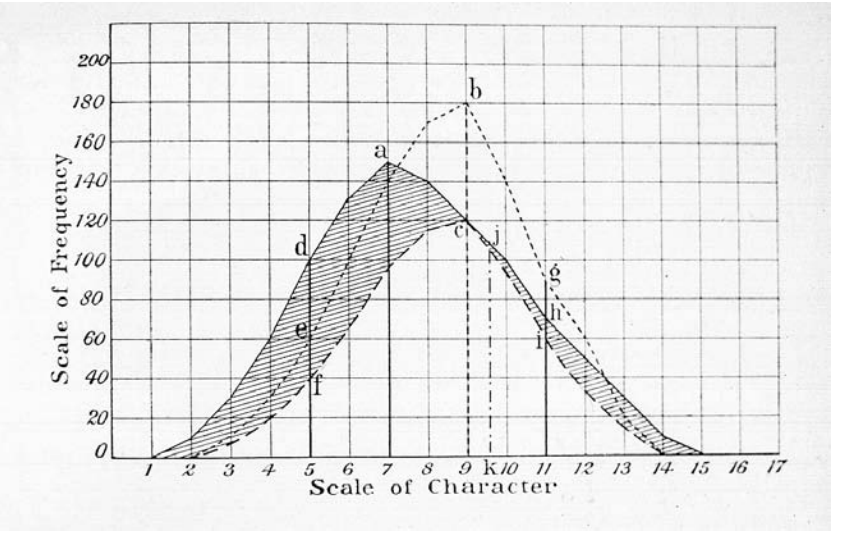

Figure 14. The graphical representation of natural selection. The shaded area represents the differential death rate as a function of the magnitude of a character. (From chapters added to *The Grammar of Science* in 1900)

publication to a few numbers—means and quartiles. This had been encouraged by Galton, on the principle that, for normal variation, nothing was lost. But Pearson took a quite different view, insisting on the necessity of using all the numbers, including the tails of the distribution, in order to calculate the constants of his skew curves. He also opposed smoothing, which might blend away double peaks of correlation surfaces.[60]

This higher mathematics, though especially valuable in his view for its contribution to quantitative studies of evolution, including eugenics, was not limited to biology. He had discovered statistics as a set of quantitative practices combining analytical and geometrical methods of solution. His papers teemed with examples from many fields, because he believed that his methods were of altogether general significance. In his boldest moments, he thought he had taken hold of the key that would open up a vast new domain of exact science and thereby contribute invaluably to the vital

[60] Pearson, *Grammar of Science,* 2d ed., 411; Pearson, "Dilettantism in Statistics," review of William Townsend Porter, *The Growth of St. Louis Children, Nature,* 50 (13 Dec. 1894), 145–146; Stigler, *History of Statistics,* 351–352; Porter, *Rise of Statistical Thinking,* 145; KP to Galton, 8 Nov. 1895, Galton Papers 293/A, where he complained of smoothing by Luigi Perozzo; also KP to Galton, 24 Nov. 1895, and KP to Royal Society, 30 Nov. 1895, Royal Society Library MM 17.55, where he complained of a memoir by Körösi that omitted the tails of the distribution.

affairs of state. Judging from a tirade against statistical dilettantism he sent to *Nature* in 1894, he seemed to think he might have a role in this monumental work:

> We want a centre, which shall not only contain a statistical museum, but embrace as well a statistical laboratory and workshop. In such a centre students might not only receive a mathematical training in dealing with raw statistics, but also be exercised in the methods of collecting and tabulating, which must precede mathematical reduction. To such a centre the biologist and anthropologist could send their measurements to be dealt with, and the economist or sociologist his price or labour statistics to be analysed. At the same time, absolute measurements might be made on the problems of evolution, disease and national economy. In this manner a number of efficient young statisticians might be trained, who would not only find a life-work ready for them in craniology, zoology, botany, and economics, but who, passing into governmental departments, census offices, and labour bureaus, might remove from us the reproach of a recent continental writer, that nowhere were statistical dilettanti so rampant as in England.[61]

Pearson's imagined engineering laboratory of measurement and graphical statics had been transformed, without quite losing its essential identity, into a program for statistical mathematics.

[61] Pearson, "Dilettantism in Statistics," 146.

CHAPTER NINE

The Statistical Reformation

> Frankly, I do not believe in groups of men and women who have each and all their allotted daily task creating a new branch of science. I believe it must be done by some one man who by force of knowledge, of method and of enthusiasm hews out, in rough outline it may be, but decisively, a new block and creates a school to carve out its details. I think you will find on inquiry that this is the history of each great branch of science.
>
> —Karl Pearson, address to the Sociological Society, in *Sociological Papers,* 1904

> It is Saint Biometrika contra mundum.
>
> —Karl Pearson to Florence Joy Weldon, 19 October 1906

PEARSON'S NEW FAITH in the world-historical role of statistics, arising gradually from about 1891 to 1894, gave him at last the mission he had been seeking for fifteen years. Statistics was close to coextensive with what he called scientific method. It was as wide ranging, and hence as glorious, as his previous enthusiasms: German philosophy and literature, scientific history and socialism, the woman question, the physics of ether and of four-dimensional geometry, and graphical statics. It had the further merit of subsuming important aspects of each of these, reaffirming the continuity of his interests and of the self that cultivated these diverse fields. This was a program that did not require the genius or good luck to slip through the formidable defenses of a well-known scientific problem, such as the structure of the ether. Pearson's scientific talents were of a different order. He was no brilliant mathematician, but a synthesizer and visionary who put together the pieces of a mathematical program with far-reaching implications for science and for the social order. He had the will and enthusiasm to make it work, despite the opposition of skeptics turned to enemies by his single-mindedness.

Missionary fervor became increasingly characteristic of the man. Like Freud's psychoanalysis, which took shape in Vienna a few years later, Pearson's statistical movement had aspects of a schismatic sect. He demanded the loyalty and commitment of his associates and drove dissenters from the church biometric. Fully aware that his severity in criticism might alienate a

friend or ally, this reformer could do no other. He identified increasingly with his Quaker progenitors, themselves relentless sectarians who suffered terribly for their faith. In this ancestry he found a eugenic explanation for his own stubborn insistence on what he thought right, the source so often of unfriendly relations with colleagues. We might suspect that his antipathy for Luther was aimed in part at a disposition he recognized in himself. By the beginning of the new century, these tendencies were more and more in the open, and at times of disappointment he could be found upbraiding the faint of heart and vaunting his statistical program as "the coming reformation" of science.[1]

Pearson issued his claim that it took a great man to establish a new field, quoted above as an epigraph, in a comment on a lecture by Francis Galton. Nominally, he placed Galton rather than himself in this role, a characteristic move for Pearson in these years. When by chance both were scheduled at almost the same time to speak at Oxford, he asked Galton to "look upon me as your John the Baptist making the way straight." But the octogenarian Galton, who always worked independently and never had students, could not construct the church biometric. Galton's role here was as a Pearsonian double, not the first we have seen, and one whose heroic efforts could be praised unreservedly. He was no institution builder but an intellectual progenitor who saw dimly what others might someday accomplish. If he was to be cast as Jesus in this passion play, Pearson was not John the Baptist but the apostle Paul, model architect of a new faith. Or perhaps he played Luther to Galton's Erasmus, one who, in response to obstacles, would give up trying to mend the old order from within. Pearson undertook instead to build the new Zion on Gower Street, where he trained converts and from which he sent out emissaries.

The spirit of his operation is nicely epitomized by his advice in 1920 to a student, Miriam Louise Tildesley, as she departed to assume a position with the anatomist and anthropologist Sir Arthur Keith. You can learn much from Keith, he wrote, "if you can preserve the traditions & spirit of the Biometric Laboratory in your new environment." Be receptive to suggestions, but don't accept them "until you have put them to the quantitative test. Always think in terms of the probable error of a judgment! . . . Don't let the principle that truth is only going to be reached by hard work & quantitative determination gradually become fainter, but look upon yourself as a missionary, not necessarily a vocal one, in a new land."[2]

[1] On Quaker hardships and plain speaking, see KP to Greenwood, 28 Dec. 1909, Pearson Papers 915; also Pearson, *Life of Galton,* vol. 1, 9, 31. Provoked by the Royal Society's rejection of a meteorological paper, he wrote to Joseph Larmor, 19 July 1904, Royal Society Library, MC 4673, of "the coming reformation of meteorology." Clearly this was about statistics and not limited to meteorology.

[2] KP to Galton, 19 April 1907, Galton Papers 293/H (phrased in the original as a question); KP to Tildesley, 9 Aug. 1920, Pearson Papers 929.

The contribution of Pearson's combative demeanor and religious sensibility to the extraordinary success of his biometric program remains an open question. Statistical thinking, having spread widely through the social and natural sciences in the nineteenth century, was already becoming formal and mathematical by century's end, and not only in Britain.[3] Galton recognized in 1889 that the time was ripe to systematize the statistical approach, even if Pearson's laborious algebra was not exactly what he had in mind. In exchanges concerning evolutionary genetics, medicine, official statistics, psychology, and anthropology, Pearson made enemies not mainly by pushing statistics where it was not wanted, but by condemning the misdirection, as he felt, of the methods that had grown up already in these fields and calling for their reformation. More often than he drew from the statistical work of authors such as Edgeworth, Arthur Bowley, Wilhelm Johannsen, Hugo De Vries, and Arthur Newsholme, he combated them. But many of these opponents were quite conscious that statistics was rapidly changing, and they were open to new methods, even if they did not immediately endorse Pearson's strenuous biometric program. As his own wayward students Yule and Raymond Pearl pointed out, he more often alienated potential supporters rather than redeeming lost souls with his fierce diatribes.

Despite it all, the form assumed by statistical mathematics in the early twentieth century owed more to him than to his colleagues and rivals. The rising prestige and influence of his program was interrupted somewhat by the First World War, resumed in the early 1920s, and then was challenged with increasing effectiveness by the equally headstrong R. A. Fisher. Since the two came to despise one another, and the younger man did much to undermine Pearson's statistical reputation, the new direction in statistics championed by Pearson is not always given its due. From the perspective of a history that looks back several centuries rather than a few decades and emphasizes the statistical practices of the sciences, 1890 appears as a turning point of decisive importance. Major Greenwood, complaining in 1941 of what he called Fisher's arrogance, recalled that a few decades earlier, "pukka mathematicians sneered at statistics and biometry. . . . Without K.P. and us, these others would never have come into statistics at all. If we didn't make the subject rigorously mathematical at least we made it intellectually respectable."[4] In the broadest sense, the mathematical and theoretical elegance of Fisher's work depended on and grew out of the biometric program. Pearson's statistics, whatever its failings, appears as one of the outstanding scientific success stories of the twentieth century.

[3] Stigler, *History of Statistics;* Porter, *Rise of Statistical Thinking;* Desrosières, *Politics of Large Numbers;* also Hald, *History of Mathematical Statistics,* who is especially original in his recognition of the Scandinavian tradition of statistical mathematics.

[4] Major Greenwood to E. S. Pearson, 2 Oct. 1941, Hacker Papers, Box 7.

Inevitably, however, it achieved less than Pearson desired. What he created was a science more methodological than substantive, one that would guide and regulate the deployment of quantitative reasoning in the professions and in administration as well as in the social and natural sciences. Statistics has been esteemed as a characteristic form of thought for an age of specialization and bureaucracy, a machinery of calculation that provides technical answers to narrowly posed questions. In reality it is of course more than this, but not nearly to the extent to which Pearson aspired. His ambitions for the field drew from and carried forward the ideals of his youth, simultaneously to reconstruct science and to transform society. Quantitative reasoning would reshape public discourse, overthrowing the egoistical appeal to private interest and prejudice by institutionalizing the socialist idiom of impersonal science and consensus. It would refashion aristocracy as well as bureaucracy as a grammar of exact science replaced the grammar of dead languages in the formation of elites. But in this sense scientific culture proved elusive, and Pearson's life, founded on extravagant ambitions, took on a tragic dimension.

Statistics as Curve Fitting

As an applied mathematician, Pearson did not participate in the Continental development of mathematical modernism, which tended to make mathematics self-referential and to value the internal rigor of a self-consistent system over any claim to truth about nature. From his time to the present day, statisticians have been divided about how far to adopt the twentieth-century culture of pure mathematics, which, even in England, did not greatly value applications. Pearson wanted statistics to be judged by its utility as a tool of scientific investigation and argued that it should always be worked out in engagement with real scientific problems and with data. The alternative was a science like hydrodynamics, "its devotees having probably never observed carefully even water running into a wash-hand basin." In this respect, his preaching was in accord with his practice. His statistical papers from the outset were full of references to evolution, astronomy, meteorology, anthropometry, medicine, education, and eugenics, and sometimes at least he was able to address real problems in these fields. In his historical lectures in the 1920s, he told the story of probability and statistics in the seventeenth and eighteenth centuries in relation to the political and religious developments of their time, with particular emphasis on how institutions such as life insurance provided a stimulus to the development of the mathematics. He complained of the narrowness of historical authors such as Isaac Todhunter, his nemesis from elasticity days, for reducing this rich and wonderful story to a tedious list of technical advances in mathe-

matics, torn from the environment that produced them. How could you hope to fire the imagination of students with a history like that?[5]

He worked at statistics for over forty years, always refusing confinement within a discipline, yet there are unmistakable patterns in his career. One was an insistence on the harmony of statistical methods with the problems under study, so that mathematical tools, empirical data, and scientific ambitions developed in synchrony. Although he spoke repeatedly of the need for experimental breeding farms to investigate questions of heredity, and for decades bred and befriended dogs, controlled experimentation was never the principal focus of his statistical work. Neither did he put much faith in "brilliant mathematics" applied to the "sparse data" of small samples.[6] His materials were more nearly natural historical, and his primary concern was faithfulness to his abundant empirical data rather than causal inference. Indeed, when data seemed to contradict calculation, he was prepared to doubt the mathematics.

The most startling instance is his early essay on Monte Carlo roulette. Since probability mathematicians had always credited gamblers with a refined sense of the odds in games they play often, and since the house had so much at stake in avoiding predictable departures from randomness, Pearson was stunned by the patterns he turned up in the statistics of the wheel. Although the distribution of numerical outcomes seemed about right, he found appreciably more switches from red to black than basic probability permitted. This conclusion inspired fears of a lawsuit from the casino, and he may possibly have tempered his conclusions so the *Fortnightly* would take it. But he was not the sort to let a publisher browbeat him into compromising his scientific principles. Probably he meant it when he interpreted his findings as a challenge to classical probability. Men of science, he proclaimed, must not "shut their eyes to the facts." Would they become angry that the casino, as a laboratory of probability, defies their subtle theories and join the campaign pressing the French government to close it down? He called instead for further study of these color runs and, if his conclusions were upheld, a reconstruction of the scientific theory of chance in deference to empirical reality.[7]

[5] Mehrtens, *Moderne—Sprache—Mathematik;* Karl Pearson, *History of Statistics,* 154–157, 456.

[6] Pearson, "Prefatory Essay: The Function of Science in the Modern State" (1902), vii–xxxvii, on xxv; Karl Pearson, *Tables for Statisticians and Biometricians,* 2 vols. (London: Biometric Laboratory of University College London, 1914 and 1931), part 2, iv–v, almost certainly an allusion to Fisher.

[7] Pearson, "The Scientific Aspect of Monte Carlo Roulette" (1894), in *Chances of Death,* 62. On fears of a lawsuit, see Frank Harris (of the *Fortnightly*) to KP, Jan. 1894, Pearson Papers 693. On breeding farms, see e.g., Pearson, "The Distribution of Prepotency," *Nature,* 58 (28 July 1898), 292–293; "Editorial," *Biometrika,* 1 (1901–2), 4.

It is hard to imagine the mathematical theory of probability reformulated to take as foundational such failures of independence as he had found in the alternation of colors at Monte Carlo. Pearson, we might reasonably suppose, was more interested in a different adaptation of probability to the facts, and he mentioned one in the concluding sentence of the essay. That was the biological theory of evolution, which by 1894 he saw as the most vital field of statistical investigation. The combinatorial operations of elementary probability might not be easily discarded, but the normal curve as a law of variation could be challenged on empirical grounds, and indeed this became practically an obsession for Pearson. His family of skew curves, like the normal itself, was derived from more basic mathematical assumptions, but he never tried to account for them in terms of the causes that produced natural variation in organisms, meteorological data, or examination results.

The bell-shaped "error law" or normal distribution, by contrast, had since Laplace been identified with a proliferation of small causes, each of which could displace a mean value up or down. Adolphe Quetelet had imagined that anthropometric objects—human bodies—might reflect a similar structure of causation. Edgeworth, who rejected the automatic assumption of normality, nevertheless appreciated the logic of its construction. Pearson was convinced also by this theory of the accumulation of small causes, which he applied to skew variation. In several early papers he tried to infer their number, the degree of an underlying binomial, from the empirical distribution. All this, however, was subordinate to the ethical principle of exact science, that curves should fit data as precisely as possible.[8]

He did not abandon the normal curve. For purposes of analyzing data, the normal was more tractable than his complicated skew curves, and Pearson sometimes assumed its validity, counterfactually, until he could learn how to handle the more general case. But the more exact fit permitted by skew curves retained its place as the higher ideal, and despite the absence of plausible mechanisms to generate them, he certainly did not regard them as mere conventions. The applied mathematician, who still aspired to dematerialize the laws of physics and replace them with pure geometric laws of space, retained his faith in curves in his new guise as a biometrician. In an early popular essay on the chances of death, for example, he broke a mortality curve for English males into five component curves of the Pearson skew type. Each rose to a peak and then declined to zero, though the general curve showed only two peaks, one in infancy and the other in old age. The five curves were centered at the ages of 71, 42, 22, 6 (but so asymmetrical that its mode or highest point was at 3.52), and

[8] See previous chapter. On the normal, see Porter, *Rise of Statistical Thinking*.

in the last month before birth. While he did offer some explanations in terms of the diseases and other causes that carry men off in these various phases of life, none could give any reason to presume that life in the womb is subject to the same hazards as infancy. Yet Pearson regarded his curve fitting with some confidence as a prediction of prenatal mortality, which had never been measured, and he called for medical statistics to put it to the test.

Similarly, in an essay on what he called "reproductive selection," he fit one of his skews to a fertility curve, representing the proportion of mothers who bear one, two, or three children in their lifetime, up to a maximum somewhere beyond twenty. But the data curve was depressed below his theoretical one for families of five or six children, and exceeded it for families of two, three, and four. The discrepancy, he explained, must be a consequence of the spreading practice of birth control. He was thus comfortable drawing causal conclusions from a quantitative model, as it might now be called, with no causal input. But this language of causal models is not Pearson's. He had sufficient faith in his geometry to anticipate valid conclusions from the curves themselves. Edgeworth commented that he had at first supposed Pearson to be speaking casually when he wrote that "'the true and only test' of a formula is its fitting (or to that effect). . . . But now I think I see that it does fairly well represent your view."[9]

The chi-squared formulation that Pearson introduced in 1900 was also part of his regime of curve fitting. He derived this function as a formal, purely quantitative standard or criterion of the adequacy of a distribution law, independent of subject matter. For his disciplinary descendants, this measure of "goodness of fit" ranks with his product-moment measure of correlation as one of his outstanding contributions to the theory of statistics. It soon became and long remained one of the most commonly used statistical tests, a test that can be applied quite generally to compare theoretical or predicted results to empirical data. For Pearson in 1900, however, it was not mainly a test of causal hypotheses, but a defense of his skew distributions and a critique of the easy assumption of the normal law, which he sought to dislodge even from its original and most secure ground as the distribution of errors of observation. A valid law of errors, he insisted, must be ascertained empirically, and his own investigations showed that the normal did not give the best fit. Edgeworth had earlier remarked that this better fit was no surprise, since the skew curves contained two more free parameters that could be adjusted in order to approximate the data more closely. But if the purpose was merely to describe or even to

[9] Pearson, "The Chances of Death" (1895) and "Reproductive Selection" (1897), in *Chances of Death,* 1–41 and 63–102; Gayon, *Darwin et l'après-Darwin,* 243–254; Edgeworth to KP, 10 March 1895, Pearson Papers 681.

extrapolate beyond the range of the available data, such considerations were irrelevant, and so they seemed to Pearson.

More than two decades later, in 1922, when R. A. Fisher offered a correction of Pearson's chi-squared analysis involving what Fisher called degrees of freedom, Pearson was unmoved. Fisher was thinking, as had Edgeworth, in terms of causal explanation, and he argued that every free parameter in the distribution formula reduced by one the degrees of freedom of the test. Pearson disagreed absolutely, without really responding to the critique. He had long since developed the use of his chi-squared analysis to test hypotheses about causes, as in a 1913 eugenic paper on the relations between paternal wages and size of family. And he was willing to recognize the relevance of a departure from independence built into the design of an experiment. Thus, in a hasty correction to his initial reply he noted that for a fixed total of persons inoculated against cholera, the number of inoculated who die clearly determines the number of inoculated who survive, so that we can have only one degree of freedom. But he denied any mathematical analogy to the situation in which he used the data to estimate one or more parameters, say the overall cure rate, then tested some prediction about inoculation and survival against the same data. He regarded curve fitting, when artfully performed, as much more than a way of summarizing data. Presumably he was responding to Fisher's mathematical critique when he inserted the following diatribe into a 1922 lecture on Galton: "'Give me enough arbitrary constants and I will describe any past experience,' cries the mathematician. 'Possibly,' replies drily the natural philosopher, 'but will your description not only suffice to predict, will it predict correctly *future* experience?'"[10]

Pearson commented several times on degrees of freedom after 1922 and never admitted any problem with his original formulation. Posterity has been unanimous in awarding Fisher the palm in this dispute. Yule and Greenwood, authors of a 1915 paper on inoculation singled out by Fisher for criticism, readily comprehended his point. They attributed Pearson's stubbornness to his personal defects, an unwillingness ever to admit error. But perhaps there is also something in Pearson's attitude that reflects a long-standing ideal of fitting curves, an understanding that made no sense to Fisher. Pearson in 1922 compared his procedures to those used by as-

[10] Pearson, "On the Criterion that a given System of Deviations from the Probable in the Case of a Correlated System of Variables is such that it can be reasonably supposed to have arisen from Random Sampling," *Philosophical Magazine* (1900); reprinted in *Early Statistical Papers;* Pearson, "On the χ^2 test Goodness of Fit," *Biometrika,* 14 (July 1922), 186–191; "Further Note on the χ^2 test Goodness of Fit," *Biometrika,* 14 (March 1923), 418; Pearson, *Francis Galton: A Centenary Appreciation, 1822–1922* (London: Cambridge University Press, n.d. [1922]), 11. See Stigler, "Pearson and Degrees of Freedom."

tronomers who, if they do not know the true value of a standard deviation, substitute the estimate from their sample and then proceed with their analysis. First estimate and then test: the purpose of estimation or curve fitting is still to match the data as well as possible. Only after establishing the highest possible standard of precision does the statistician proceed to analysis and testing of hypotheses. On this occasion, and in much of his work, Pearson seemed to think often in terms of his old ideal of conveniently summarizing the data, of framing quantitative science as an exercise in geometry. To Pearson, Fisher was mixing up what belonged apart, just as Edgeworth had done a quarter century earlier.[11]

Pearson's ethic of scientific description implied no skepticism about the reliability of knowledge. It did not reject generalization, but advanced seamlessly from measurement to prediction, without interposing causes as an intermediate stage in the reasoning. This was quantification in the descriptive mode of graphical statics, a visual logic of statistics that accorded nicely with the philosophical principles of *The Grammar of Science:* "The mission of science is not to explain but to describe; to discover a descriptive formula which will enable men to predict the nature of future perceptions." Statistics, according to Pearson, can and must distinguish random or misleading associations from those correlations that have implications for the future, but it deals ultimately in phenomena, not material objects or effective causes.[12]

The Science and Philosophy of Correlation

Correlation was the key to biometry. Predicting the consequences of natural selection, Pearson argued, required a measure of the interactions of organs or traits that tended to vary together. A complete correlational theory of natural inheritance should demonstrate the possibility of unlimited evolutionary progress through the gradual accumulation of continuous variations. Galton, who by 1885 was using "regression" for the basic

[11] R. A. Fisher, "On the Interpretation of χ^2 from Contingency Tables, and the Calculation of P," *Journal of the Royal Statistical Society,* 85 (Jan. 1922), 87–94; G. U. Yule and M. Greenwood, "The Statistics of Antityphoid and Anticholera Inoculations, and the Interpretation of Such Statistics in General," *Proceedings of the Royal Society of Medicine,* 8 (1915), 113–190. An exchange of letters by Yule and Greenwood about Pearson after the great man's death may be found in Box 2 of the Yule Papers (DP97), Royal Statistical Society. See Baird, "The Fisher/Pearson Chi-Squared Controversy"; Magnello, "Pearson's Mathematization of Inheritance"; and especially Stigler, "Pearson and Degrees of Freedom."

[12] Pearson, "Reaction," in *Chances of Death,* 200; Pearson, "The Utility of Specific Characters," *Nature,* 54 (15 Sept. 1896), 461.

mathematics of heredity, had chosen this term to express the overpowering tendency for the descendants of exceptional parents to return gradually to the mean, understood as a point of stability. He came to believe that secular evolutionary change was not possible through the action of natural selection on continuous variation, but depended on the spontaneous production of "sports," representing new points of stability.

Pearson doubted the evidence for such irregularities, arguing that ostensibly discontinuous change might arise from a happy combination of continuous variations of several traits at once, which he described geometrically as a displacement on a surface of many dimensions. He also challenged the standing of points of (physiological) stability, discrete foci of regression, as obstacles to continuous evolutionary change. He wondered at first if the tendency to regress to the population mean might owe to the effects of hereditary elements or "gemmules" (as Galton had called them) passed on from more remote ancestors. Or the exceptional "organ" or trait might regress due to interactions with other organs, which would on average be more mediocre than the organ under study. The mathematical tool for studying such interactions, whether among the various organs of a single individual or of a single organ across the generations, was correlation. He codified the mathematics of Galton's statistical idea, then worked for years to develop suitably flexible methods for dealing with many variables at once. Multiple correlation should enable the biologist to combine all effects into a single analysis. The results of multivariate statistics, he found, were favorable to Darwin's theory of progressive evolution by natural selection and to his own faith in gradual evolutionary progress over abrupt or revolutionary change. Although unusual traits, appearing in isolation, would indeed tend to return to the mean, the characteristics of exceptional parents should be preserved in the offspring with very little regression.[13]

As statistics and especially biometry came to dominate Pearson's scientific work, correlation assumed an increasingly central role in his philosophical defense of science. Although he had argued forcefully for the unity of scientific method in the first edition of the *Grammar of Science,* he was not then prepared to see the same role for variability in physics as in the sciences of life. This was an old problem in statistical reasoning. For almost a century, since the time of Gauss and Laplace, the method of least squares had been grounded on an assumption that measurement variation

[13] KP to Galton, 6 Sept. 1898, Galton Papers 293/C; Pearson, "Mathematical Contributions to the Theory of Evolution.—III. Regression, Heredity, and Panmixia," *Philosophical Transactions of the Royal Society of London* (1896), reprinted in *Early Statistical Papers,* 113–178, esp. 166–178; Pearson, "Mathematical Contributions to the Theory of Evolution. On the Law of Ancestral Heredity," *Proceedings of the Royal Society of London,* 62 (1898), 386–412; Pearson, *Galton,* vol. 3A, 78.

was due to the impossibility of perfect observational precision. The bell-shaped "error curve," built into the standard mathematical derivation of least squares, really was about error for them, and not about variation in nature. When Quetelet and then Galton extended its reach to variability in organic measures, it seemed that a new concept was called for, and in 1893 Pearson formally adopted a term Galton had used more casually, "normal law." This distribution had a role in physics too, ever since 1860 when Maxwell proposed that molecular velocities were distributed according to an extension of the same principle. But Maxwell did not suppose that the structure of molecules and atoms varied in the same way as their velocities. On the contrary, he spoke of them as "manufactured articles" and interpreted their perfect uniformity as pointing to a Creator.[14]

The method of drawing a line or other curve through a scatter of observations by minimizing the sums of squares of the deviations continued, into the 1890s, to be associated specifically with error. Pearson, as we have seen, did not fit curves this way, but instead imported from mechanics the method of moments. Eventually he would accept least squares as one of the fundamental conceptions of statistics, but the initial impulse in this direction came from Udny Yule. Yule had studied applied mathematics with him at University College and then spent a year in the Bonn physics laboratory of Heinrich Hertz before returning to London as Pearson's assistant. In 1896, he justified the use of least squares in his correlational study of poverty rates and poor law administration by arguing for an analogy between sociological or biological relations and physical ones. Since variation in physics was fundamentally similar to biological variability, even the equations of physics were at bottom only average relations, and this made the theory of least squares appropriate also for social and biological science.

Pearson's immediate reaction was to protest. There is an essential difference, he told Yule: "The greater your methods & powers of observations the closer the physicist gets to a single valued equation." Before long he changed his tune. While he never disavowed his point that functional relations of variables were tighter in physics, he came to see it as less fundamental than the central role of variation in all our perceptions and measurements, whether in physics, biology, or social life. This view was in good accord with the idealist metaphysics of the *Grammar of Science*, and it eventually became a part of Pearson's creed. He liked to think of this argument, by analogy to the whole range of his scientific commitments, as a once-heretical position that had since begun to gain acceptance, preparing the ground for the new science of biometry. When he got wind that

[14] Porter, *Rise of Statistical Thinking;* Schaffer, "Late-Victorian Metrology and Its Instrumentation."

ideas like those of the *Grammar* were to be preached to the mathematical-physical section of the British Association in 1899, he spoke of the scientific establishment coming around to views it had recently condemned and announced to Weldon "the end of the distinction between exact and descriptive sciences."[15]

His understanding of the significance and meaning of correlation also shifted gradually. His pioneering 1896 paper on correlation, very much a contribution to the "mathematical theory of evolution," did not even refer to correlation in the title, but instead named three biological concepts, "heredity, panmixia, and regression," as its objects. While the paper referred to Galton's *Natural Inheritance* as epoch making, Pearson credited the theory of correlation to the French military officer and polymath Auguste Bravais, who had written down its basic mathematics. In a historical study in 1920, Pearson would argue that Bravais went only a little beyond Gauss, having never conceived his *x, y,* and *z* as variables that could be directly measured and then subjected to a mathematics of association to determine their interrelationships. In 1896, however, he reduced the conceptual dimension of Galton's achievement to a novel deployment of established mathematical methods.[16]

Soon Pearson began to see correlation as first of all conceptual and philosophical, indeed as the culmination and vindication of his own philosophy of science. By this time he was playing the role of John the Baptist, building up mathematical statistics through the creation of a Galton mythology. He first asserted the profound philosophical importance of correlation in one of his 1907 talks at Oxford University. He prepared the ground for Galton's imminent appearance there by giving his Boyle Lecture on the role of eugenics in the modern state, and his paper for the Oxford Philosophical Club on "the possibility of a wider category than causation." As he explained to Galton, the second presentation set out from "the idea that no two physical entities are exactly alike," not even two atoms, since there is always variation about the mean. "Hence in physics the ultimate basis of knowledge is statistical, a correlation & not a causation." Causation reduced to a limiting case where the residual variation was very low. These arguments, he reported, had perplexed the philosophers and annoyed the scientists in his audience. Even Galton asked skeptically if he had any evidence for the variability of atoms.[17]

[15] Stigler, *History of Statistics,* 351–352; KP to Yule, 17 Sept. 1896; KP to Weldon, 31 Aug. 1899, Pearson Papers 266/9.

[16] Pearson, "Notes on the History of Correlation," *Biometrika* (1920), reprinted in E. S. Pearson and Kendall, eds., *Studies in the History of Probability and Statistics,* 191; Pearson, "Mathematical Contributions to Theory of Evolution.—III," 121.

[17] KP to Galton, 19 April 1907, Galton Papers 293/H and Galton reply, 22 April 1907, Galton Papers 245/18H; reprinted with stylistic editing in Pearson, *Life of Galton,* vol. 3A, 314–315. There is no evidence of a reply by Pearson to this last question.

But Galton was to become a patron of this argument, no matter what he thought of it. When he died on 17 January 1911, Pearson began to preside over his immortality. The third edition of *The Grammar of Science,* dated 19 January 1911, announced that science had been transformed by the discovery of correlation. "It is this conception of correlation between two occurrences embracing all relationship from absolute independence to complete dependence, which is the wider category by which we have to replace the old idea of causation." The tighter correlations and lesser variability of physics were differences of degree and not of kind. Galton, he proclaimed in his biography, "relieved us from the old superstition that where causal relationships could not be traced, there exact or mathematical inquiry was impossible." Pearson recalled an impossible scene featuring "some of us in the 'eighties, when fresh from Cambridge we encountered his papers." The one on correlation worked "a revolution in our scientific ideas," and now (1930) there are thousands of correlation coefficients calculated every year in psychology, medical statistics, sociology, and anthropology. "This has not only enormously widened the field to which quantitative and therefore mathematical methods can be applied, but it has at the same time modified our philosophy of science, and even of life itself."[18] The boundaries of science, he suggested, would henceforth be practically coextensive with those of statistics.

Data and Calculations

This scientific program of fitting curves and calculating correlations depended on the availability of data. Pearson was assiduous in compiling measures of all sorts, and as he accumulated the resources to build up a staff, these activities expanded. His early papers, especially the pioneering one on skew curves, integrated statistical mathematics with abundant and diverse data gathered mainly from the work of other inquirers. But he imagined biometric statistics as analogous to the methods of the Registrar-General, and while this pointed intellectually to a science that reasoned from mean values on the presumption of an underlying stability of statistical objects, he also took seriously the institutional analogy. His laboratories became, in a way, a Biometric Registry Office. He assembled a team of workers to collect, measure, and compute, and surrounded them with measuring devices and calculating machines. The data and calculations depended particularly on the work of two women, Ethel M. Elderton and Alice Lee, who also wrote and coauthored papers. With assistance from various donors, he founded or took over a web of laboratories, of which

[18] Pearson, *Grammar of Science,* 3d ed. (1911), 157, 173; Pearson, *Life of Galton,* vol. 2, 358; vol. 3A, 1 and 56–57.

the Biometric Laboratory, created with a grant from the Company of Drapers in 1903 and the Eugenics Laboratory, Galton's brainchild, were the most prominent.[19]

One result of all this computation was an array of tables, most of them published first in *Biometrika* and then compiled into reference volumes. Although Pearson did not believe in textbooks, he introduced these books with sample problems and guidelines for reducing them to a suitable form and finding the appropriate entry in his tables. The introductions conveyed the basics of statistical reasoning as he understood it. In most cases this meant fitting a density curve or surface to the data, then perhaps determining whether a point or set of data is consistent with the distribution. In one example, he compared measures of a skull of uncertain provenance with a collection of French ones, and calculated odds of 454:1 against so great a deviation complex if it were French. He did not suppose that a mastery of statistics could be attained simply by studying these examples, but he thought the tables well suited to serve as the basis for personal instruction in a statistical laboratory.[20]

Pearson firmly denied that correct method in biometry meant assembling numbers indiscriminately and then deciding what to do with them. "The first point in any work in this field is to have a real biological, anthropological, or sociological problem which *needs* solution, the second to discover the right material to discuss it upon, and only the third to select and apply the appropriate statistical methods."[21] Often, however, he went looking for materials to illustrate the use of a new method. Also, since appropriate statistical records could not be called up at will whenever a problem presented itself, Pearson and his coworkers devoted immense effort to assembling a general fund of measures suited to biometric investigations. His was not the formalized protocol that later came to pass for scientific method at journals and granting agencies, in which a specific question is asked, a hypothesis offered, an experiment proposed, and statistical methods of analyzing the data specified, before work begins. Many of his investigations were more nearly exploratory, gathering data and looking for correlations that might be of interest. This was not merely indiscriminate, since he had definite ideas about what problems were pressing and what solutions promising, but his style of statistics depended on an abundance of materials and of data, and he assembled them aggressively.

[19] Pearson, "Walter Frank Raphael Weldon, 1860–1906," *Biometrika,* 5 (1906), 1–52, on 19; R. Love, "Alice in Eugenics Land: Feminism and Eugenics in the Scientific Careers of Alice Lee and Ethel Elderton," *Annals of Science,* 36 (1979), 145–158; Magnello, "Non-Correlation of Biometrics and Eugenics."

[20] Pearson, *Tables for Statisticians,* part 1 (1914; 2d ed. 1924), vi–vii, xxiv–xxvi; part 2 (1931), iv; Cox, "*Biometrika:* The First Hundred Years," 6.

[21] KP to Carnegie Institution, 28 Oct. 1905 (a recommendation for Raymond Pearl), Pearl Papers, American Philosophical Society.

He was persuaded from very early of the research value of human skulls for investigating racial differences. In June 1895, Galton put him in contact with Franz Boas, then at the Bureau of Ethnology in Washington, D.C., "a real catch for you" since he had "heaps" of measure of whites and North American Indians. Soon Pearson was probing Boas for information about relative degrees of correlation in "civilized" and "uncivilized" races.[22] He also befriended the University College archeologist Flinders Petrie, who collected all kinds of artifacts from Egypt, including great numbers of skulls. And he began his own collection, which became a lifelong project. "I have been down to College this morning," he wrote Yule in July of 1895, "—the skulls are *simply perfect,* most fascinating." He acquired an armamentarium of anthropometric instruments to measure them along all their dimensions, and this kind of work became routine in his laboratory. They had to be quick to keep the materials flowing, as he complained when university administrators seemed to be putting red tape in his way. "A plague pit was opened in Broad Street on Thursday last," he wrote his provost in 1903, "& by Friday morning one of my workers, Mr. S. M. Jacob, had with unwonted energy 'begged' the whole of the crania & skeletons for the College." Had he been obliged to wait for Council approval, Oxford or Cambridge would have made away with the loot.[23]

Nobody could have foretold the results of this skull research. Pearson was soon convinced that none of the features of skulls, including interior volume as well as the much-vaunted "cephalic index" that measured longheadedness, correlated reliably with mental abilities. He and his coworkers were the first to discredit on the basis of quantitative evidence the claim that skull volume measures proved the inferior intelligence of women. He wanted to use craniological features to reconstruct patterns of migration and to distinguish evolutionary change within a race from changes owing to its replacement by an invading population. He also began using photographs and measurements to fix the identity of mortal remains, most notably in a profusely illustrated memoir on the skull of Oliver Cromwell.[24]

As much as he believed in mathematics, he lived his life above all for data. This comes across clearly in his frequent critiques of every form of mathematics that remained aloof from all empirical reality—that is, from tallies and measurements. It takes two years, he once told Fisher, to turn a

[22] Galton to KP, 19 June 1895, Galton Papers 245/18A; also Boas Papers at American Philosophical Society, and Pearson Papers 639/2.

[23] Flinders Petrie to KP, Pearson Papers 815 (there are several letters from KP to Petrie at the Petrie Museum, University College London); KP toYule, 21 July 1895; KP to Gregory Foster, 2 Aug. 1903, College Correspondence AM/D/238 (University College Archives).

[24] Fee, "Nineteenth-Century Craniometry"; Oppenheim, *"Shattered Nerves",* 185; KP to Galton, 25 Oct. 1901, reprinted Pearson, *Galton,* vol. 3, 247; Karl Pearson and G. M. Morant, *The Portraiture of Oliver Cromwell with Special Reference to the Wilkinson Head* (Cambridge: Cambridge University Press, 1935).

Figure 15. The statistician at work, with skulls and Brunsviga. (Courtesy of UCL)

good Cambridge wrangler into a statistician. What he meant was that the wranglers had to get out of the closed world of analysis and learn to do real mathematical science, the science of quantity. Late in life he came to admire the efforts of Condorcet before and during the French Revolution to use mathematics to advance justice. Condorcet's great shortcoming was his indifference to data, a defect he shared with his Gallic milieu, and Pearson, echoing Edmund Burke, speculated that this failure to test their theories with practical facts made him and his science-minded allies incapable of guiding the French Revolution.[25]

The values of calculation became a part of Pearson's being, and he willingly snared himself in his own quantitative net. His recurrent trips after 1897 to the ancestral home in Danby to uncover family records were not, as might at first appear, a mere exploration for private purposes of the family tree, to learn his eugenic background. He was responding to his own solicitation for family data. Galton had introduced these "Records of Fam-

[25] KP to R. A. Fisher, 2 Aug. 1919 (originals in Adelaide, Australia), Hacker Papers, Box 17; Pearson, *History of Statistics,* 427.

ily Faculties," asking volunteers to send detailed information about as many relatives, living and dead, as possible. Pearson carried on and expanded this initiative, one product of which was the vast *Treasury of Human Inheritance*. Among the families mentioned in those volumes were the Yorkshire Pearsons.[26]

The contents of the *Treasury* point to one other aspect of his data-collecting activities—that he wanted to investigate traits that really mattered, not merely to assemble data sets on which to exercise his statistical tools. Since he was convinced that physical measures gave very little insight into mental capabilities, he declined to use them for this purpose. He insisted that (biological) anthropology should concern itself with really important characteristics, and not be content with easily measured ones. This meant studying character, will, and mental quickness, traits with consequences for the "struggle of nations," and assigning numbers as best one could. He gathered up a large stock of evaluations of pupils by their teachers to compare their abilities with those of siblings, and to assess them against the achievements of their ancestors. This was in defiance of a near consensus among natural scientists, which associated proper numbers with neutral instruments, not personal judgment. At the Royal Society in 1902, according to Pearson, the biologist Ray Lankester called it a "disgrace" to put any weight "on examinations or on the opinions of schoolmasters." Pearson believed that those in authority at schools and other institutions should have the capacity to make such determinations. His mature understanding of objectivity joined it to wisdom and self-control, and did not imply a radical exclusion of the personal.[27]

He also built an element of judgment into the interpretation of statistics. The Fisherian style of significance testing, as it was established in many disciplines in the 1940s, typically enforced a particular standard, most often the probability measure 0.05, as defining a credible scientific result. Fisher himself preferred greater flexibility, leaving room for scientific judgment. Pearson wanted to supply "as in physics" the probable error, and let readers fix their own standard of improbability. This was in a way to affirm Laplace's well-known line about probability as common sense

[26] KP to Yule, 15 Aug. 1897 (from Danby); Pearson, "Statistical Investigation in Variability and Heredity," *Nature,* 64 (30 May 1901), 102, an appeal for school forms, orange-tip butterflies, and blackbird or thrush eggs for various statistical investigations.

[27] Pearson, "Useless Body Measurements: A Call to Discard 'Rusty Old Weapons,'" letter to *The Times,* 25 Aug. 1920, 14e; "Tests of Mental Capacity," letter to *The Times,* 14 Jan. 1926, 8b; Pearson, *Life of Galton,* vol. 2, 232; KP to Galton, 28 Jan. 1902, Galton Papers 293/E. He presented the results in his Huxley lecture for 1903, "On the Inheritance of the Mental and Moral Characters in Man, and in Comparison with the Inheritance of the Physical Characters," *Journal of the Anthropological Institute of Great Britain and Ireland,* 33 (1903), 179–237 (and reprinted in *Biometrika*, 1903–4).

reduced to calculation or, as Pearson might have preferred, statistical mathematics as a tool to elevate and inform common sense.[28]

The Statistician Embattled

Pearson's combativeness was apparent already in his undergraduate days and again during the 1880s in acerbic political lectures and reviews on the German Reformation, but it was not until he found his calling in statistics that polemic became his métier. At times, especially during his decade or more of battles with the English biological establishment after 1899, he felt wounded by the hostility of his opponents. He was still more hurt by former students who seemed to turn against him. In the midst of a dispute with Yule about contingency tables and with William Bateson about statistics and Mendelism, he lamented to Joseph Larmor at the Royal Society that he never himself started controversies, but was attacked gratuitously in scientific papers in the name of original research. The Royal Society, he advised Michael Foster, should publish only enduring knowledge and remain aloof from ephemeral attacks.[29] This was a policy he conspicuously failed to apply as an editor, unless Pearson the critic be granted his understanding of self as above party prejudice. His disputes were really all the more bitter on account of this attitude. He was beyond question a fierce antagonist, and he made many enemies.

On occasion Pearson seemed close to paranoia, as evidenced by pointless and petulant insults scattered through inappropriate venues such as *Biometrika*—"surely the most personally-edited journal that was ever published," remarks Yule. Yule's examples include two titles, both from the terrible year 1914: "On certain errors with regard to multiple correlation made by those who have not adequately studied the subject," and "Correction of a Misstatement Made by Mr. ———," where the name omitted by Yule, but not by Pearson, was that of Yule's close friend and Pearson's former student, Major Greenwood. Still stranger is a line inserted in the third volume of his monumental Galton biography, where he referred to a statistical paradox now "again confusing the minds of Professors Raymond Pearl and Leonard Hill, who cannot grasp. . . ." He was by then on good terms with Pearl, also a former student with whom he had for a time fallen out, and a few years earlier he had sent Pearl a review copy of

[28] KP to Greenwood, 7 Jan. 1905 (he stipulated that the standard of improbability should be between two and four probable errors); Pearson, *Life of Galton*, vol. 2, 150.

[29] KP to Larmor, 19 July 1904, RR16.415; KP to Michael Foster, 5 Feb. 1902, CD 260, Royal Society Library.

the second Galton volume with the comment: "You are one of the few people who will be able to appreciate Vol. II of the Life from the statistical side."[30]

Yule referred in his obituary to Pearson's domineering personality, and this aspect cannot be entirely discounted, but the personality by itself is of only secondary interest here. The point is to understand these controversies in relation to Pearson's statistical project, his social vision, and his sense of the role and mission of the scientist. As in *The Grammar of Science,* he often argued that scientific method is distinctly valuable for society because it overrides subjectivity to produce consensus. This did not mean that disagreement was necessarily inconsistent with productive work at the frontiers of research, but it did discredit scientists whose methods could not yield conclusive results. After 1892 he looked to create objectivity by showing the way to an exact science of life, mind, and society. Authoritative science, he held, was crucial for social stability, and practical biological knowledge, that is, eugenics, would be needed in the struggle of nations that had now become so pressing.

He announced his grand ambition in an 1894 review on "Socialism and Natural Selection," called by his editor at the *Fortnightly Review* "the most important contribution to social science that has been made for twenty years." Despite his professed disdain for the "enthusiasm of the marketplace," Pearson welcomed the chance to express in a public forum his new mathematical creed.[31] The vital problems of evolution and society, he declared, were now *mathematical* problems, and he looked to a future when "the loose qualitative or descriptive reasoning of the older biologists must give way to an accurate mathematico-statistical logic. The trained biologist may discover and tabulate facts, much as the physicist does today, but it will need the trained mathematician to reason upon them. The great biologist of the future will be like the great physicist of to-day, a mathematician trained and bred."

It is scarcely surprising that such messianic ambitions should have occasioned unease among biologists. There also were forebodings of conflict in his attack here on the doctrines of August Weismann, then at the peak of his influence in Britain, and his allegation that biology had of late declined into "semi-metaphysical" reasoning, akin to that of "mediaeval writers on

[30] Yule, "Karl Pearson," 101; Pearson, *Life of Galton,* vol. 3, 103; KP to Pearl, 3 Oct. 1924, Pearl Papers, American Philosophical Society.

[31] *The Chances of Death* had only one edition. *The Ethic of Freethought* had, by 1892, sold 427 copies from a print run of 1000. Another 105 were given away, leaving 468 to be remaindered at half price. If Bernard Shaw is to be believed, its inclusion on the Fabian list "What to Read" then cleared the stock. In 1901 it had a second edition. T. Fisher Unwin to KP, Pearson Papers 866/6; Shaw to KP, 14 Nov. 1892, Pearson Papers 853.

physics."[32] Pearson's excitement in these years about the statistical study of Darwinian evolution reflected also a sense of social and political mission, to provide a quantitative basis for policy choices. In alliance with Weldon, and with the support of assistants such as Yule and L.N.G. Filon, he seemed to be making good progress in the 1890s, condoned if not welcomed by other biologists.

The quiet was disrupted by increasing tensions between statistical and experimental biology in the last years of the old century. Pearson did not initiate the controversy, which broke out in 1895 between Weldon and his friend and contemporary from St. John's College, Cambridge, William Bateson. While both were admirers of Galton, Bateson endorsed the master's doctrine of discontinuous evolution between organic points of stability rather than his statistical methods. A dispute about the interpretation of some biological data, overlying this disagreement about the mechanism of evolution and the best way to study it, turned quickly to intense personal enmity. Pearson was brought into the debate in late 1896 when he joined the Royal Society's Committee for Conducting Statistical Inquiries into the Measurable Characteristics of Plants and Animals, which had been formed three years earlier by Galton and Weldon. Also in 1896, on Galton's initiative and against the advice of Pearson and Weldon, the committee was enlarged by the addition of Bateson and several other biologists.

The same year, Galton introduced his statistical "law of ancestral inheritance," which, without specifying any genetic mechanism, expressed in percentages the contributions of parents, grandparents, and more remote ancestors to the inherited traits of an individual. That law, and Pearson's more mathematical revision of it in early 1898, hardened the resolve of the skeptics of statistical biology. Shortly afterwards, Gregor Mendel's studies of the inheritance of discontinuous traits emerged into the limelight—with Bateson as his leading champion in England—more than three decades after their initial publication. Pearson never took so public a role in these debates as Weldon, but he too felt excluded by the biologists. Galton, Weldon, and Pearson all resigned in frustration from the Statistical Committee in early 1900. Later that year, a very long memoir by Pearson was handled badly at the Royal Society, which circulated a criticism by Bateson even before the referees were sent the completed version of the memoir itself. Pearson and Weldon were understandably angry, though in one respect they may have welcomed the opposition, since it provided the occasion to solidify their scientific program by creating a journal of their own. *Biometrika*, established in 1901, became the official organ of the

[32] Pearson, "Socialism and Natural Selection" (1894), in *Chances of Death,* vol. 1, 103–139, on 103–105; H. Blanchamp to KP, 21 June 1894, Pearson Papers 693. He also raised Pearson's fee.

new statistics, the standard-bearer of a quantitative program in opposition to the biological mainstream, seeking converts. These debates crystallized as the "Biometrician-Mendelian controversy," which blazed away until Weldon's sudden death in 1906. Bereaved scientifically as well as personally, Pearson then largely abandoned experimental studies of evolution, though the attacks continued on both sides.[33]

Pearson is often supposed to have rejected Mendelian genetics on account of his positivistic refusal to countenance invisible, hypothetical objects. This is quite mistaken. As we have seen, he quested for the most remote and fundamental entities. Having swallowed protyles and ether squirts pouring forth from a higher dimension, he was unlikely to choke on genes. He called the genetic element a conception rather than a material reality, but for this philosophical idealist all explanations were conceptual, and if the status of the "gene" (a new word in the new century) remained uncertain, this was because it had not yet been made an object of sensory experience. His critical razor slashed away not at genes and molecules, but at reifications of categories he thought purely descriptive, such as "force" and "matter." He never disputed the reality of Mendelian unit characters on philosophical grounds.

Indeed, he never challenged their existence at all, but was at pains to emphasize his open-mindedness about Mendelism. He wrote in *Nature* in 1904 that the existence of Mendelian traits, exhibiting a degree of discontinuous variation and the characteristic ratios of dominant and recessive traits, was perfectly compatible with the biometric program, and indeed implied a law of hereditary regression. In a scientific paper the same year, he pursued a line of inquiry initiated by Yule as to the consistency of predictions based on Mendelism with observed regressions of offspring on parents, finding them somewhat too low. He called this a challenge to the Mendelians, but then a few years later undertook to clear up the discrepancy himself. In 1910, he told Pearl that Mendelism led directly to the law of ancestral inheritance, a geometrical decrease of hereditary influence with successively more remote ancestral generations. In 1922, he wrote rather favorably about Mendelian genes, though stipulating that even simple traits typically involve five or ten of them. Near the end of his life, he meditated that since science is only description, nature may be accurately characterized in more than one way. It was, he charged, the Mendelians—he meant Bateson—who defined one and only one approach as legitimate.[34]

[33] Provine, *Origins of Theoretical Population Genetics,* chaps. 3–4; MacKenzie, *Statistics in Britain,* chap. 6; Olby, "Dimensions of Scientific Controversy"; Rushton, "Nettleship, Pearson and Bateson"; Sloan, "Mach's Phenomenalism."

[34] Norton, "Metaphysics and Population Genetics"; Morrison, "Modelling Populations"; Pearson, "Mendel's Law," *Nature,* 70 (27 Oct. 1904), 626–627; KP to Pearl, 28 Feb. 1910; Pearson, *Galton Centenary,* 10; Pearson, *Life of Galton,* vol. 3, 288.

Pearson's philosophy of tolerance, however, was cast in the terms of positivist measurement, not quite a neutral language. "Biometry is only the application of exact statistical ratios to the problems of biology. . . . A description by modern statistical methods need not, as such, be itself opposed to any physiological hypothesis."[35] The problem was not that Pearson rejected genes or Mendelian ratios, but that he subordinated them to a larger program of statistical description and prediction, and that he regarded the higher statistics as the appropriate standard even for Mendelian genetics. Statistical methods and positivistic laws in biology were thus elevated over experimental interventions and genetic reductions. What Pearson allowed in principle he often scorned in practice, finding decisive statistical flaws behind most Mendelian findings during the years of sharpest debate. On some matters his opponents provided him easy targets, as with their proliferating claims for one-gene traits, such as criminality, pauperism, and feeblemindedness. Such simplicities were condoned or even "discovered" in many cases by prominent university biologists. To Pearson, this simplistic Mendelian eugenics invited ridicule of his favorite political issue. He fell out with Charles Davenport, listed at first as a founding *Biometrika* editor, over such issues, and he suspected that Americans were particularly susceptible to Mendelian follies. "I think the day will come," he told Pearl, "when American men of science will themselves protest against the work that has been put forth in the name of eugenics."[36]

Pearson's ambitions, uncontainable within any disciplinary barriers, led him into disputes wherever he thought statistics was needed but not deployed or was being used fallaciously. He complained of the failures of anthropometry and sought to define for this field a new standard of statistical quality—hence a new character and method for the anthropologist.[37] He attacked the theory of general intelligence put forth by his University College colleague, the experimental psychologist Charles Spearman, for faulty statistical methods and rejected the mathematics of general and specific factors that gave a theoretical grounding for IQ, the intelligence quotient.[38]

He was most frequently provoked, however, by medical and public health writings, and his disputes about tuberculosis, parental alcoholism, and the "opsonic index" as a guide to vaccine therapy were played out in

[35] Pearson, "Mendel's Law."

[36] See his correspondence with Davenport, held by the American Philosophical Society; KP to Pearl, 20 Dec. 1913. On these matters, see Kevles, *In the Name of Eugenics;* Spencer and Paul, "Failure of a Scientific Critique."

[37] He spoke in such terms in KP to Greenwood, 14 Aug. 1920, Pearson Papers 915.

[38] Karl Pearson and Margaret Moul, "The Mathematics of Intelligence, I. The Sampling Errors in the Theory of a Generalised Factor," *Biometrika,* 19 (1927), 246–291; Pearson (anonymously), "The Mathematics of Intelligence" (review of Spearman, *The Abilities of Man*), *Nature,* 120 (1927), 181–183; also letters to *Nature* about this, Pearson Papers 771/6.

semipopular lectures as well as *Biometrika* articles. He took a dim view of medical science, which, he told Shaw, was full of humbug, because medical researchers feigned omniscience so their former students would refer patients to them for consulting practice. He called for more "general culture or academical training" for practitioners and for hospital doctors to be paid as teachers and researchers. Above all, medicine needed statistics, whose proper role he saw as comprehensive. Statistics could define a new basis for clinical studies of therapeutic effectiveness as well as for public health investigations of the causes of illness and the effects of habits and environments. Perhaps it could even cure the most pervasive shortcoming of the medical profession, "that it mistakes association for causation."[39] Notwithstanding his professed skepticism about causes, he rejected mere correlations in medicine. To get beyond them, he advocated large-scale medical experiments with controls. On one occasion, he proposed to test antityphoid serum by inoculating every second man in a regiment of eight hundred and using statistics to determine if the results were "significant."[40]

In addition to his programmatic and critical writings, Pearson carried the flag for statistical medicine by assembling detailed family records and by studying the variability of disease. By the 1920s his message was getting through. Although he declined the invitation to chair an "advisory committee on statistics" under the Medical Research Council, he left a legacy through the work of Major Greenwood. A doctor by profession, Greenwood had been inspired by *The Grammar of Science* to answer the call of the higher statistics. During the 1920s and 1930s, his position at the Ministry of Health and association with the Medical Research Council gave him the standing to incorporate statistical designs and analyses ever more systematically into medical studies. His own student, Austin Bradford Hill, provided much of the statistical expertise in the late 1940s for the landmark British randomized clinical trials. This experimental tradition developed out of Pearson's teaching, though with increasing input beginning in the 1930s from Fisher's work on the design of experiments. Pearson's medical battles, which peaked in the decade before the Great War, generally involved a combination of statistical and eugenic principles as well as a deep suspicion of scientists who sold their souls to popular movements, this much-despised "enthusiasm of the marketplace." Typically, as in his polemics about the effects of parental alcoholism on offspring, he held that unthinking or tendentious quantification lent spurious credence to superficial environmental explanations when deeper and more powerful

[39] KP to Leonard Huxley, 5 May 1898, Huxley Papers 24.91; KP to Bernard Shaw, 8 Nov. 1910, Ransom Library Research Center.

[40] KP to Lt. Col. R.J.S. Simpson, 24 May 1904, Pearson Papers 159/1; Matthews, *Quantification and the Quest for Medical Certainty*, 99.

hereditary ones were passed over. These were rarely presented as honest differences of opinion, but rather as a failure of competence or scientific spirit in his opponents.[41]

As Yule, who suffered much, implied in his obituary notice for the Royal Society, the unfailing courtesy and generosity of Jekyll in personal matters gave way to the viciousness of Hyde whenever Pearson was challenged on a scientific issue. There were a few exceptions. He was always respectful of research physicists, as opposed to mere textbook writers, even when they violated his canon of proper scientific thinking. His frequent attacks on doctors, psychologists, and social scientists thus betrayed a meager respect for their fields. Galton, a crucial source of his statistical methods and, by the late 1890s, something of a father-figure for him, always had Pearson's respect, really reverence, even when his expressed doubts went to points of some consequence. Conversely, Galton remained profoundly loyal to his statistical protégé. Weldon, who could be as cantankerous as Pearson, also maintained the right to dissent and sometimes exercised it bluntly. In early 1895 he criticized Pearson at a Royal Society meeting, inspiring the latter to complain that he felt as if a family squabble were being publicly aired. There must be some deeper reasons for such misbehavior by this "splendid fellow," he told Yule. "I fear he considers that we are poaching on his preserves. I would retire at once, but I am sure only the mathematician can bring down the game upon them."[42] In the end, their alliance proved stronger than such tensions, and within a few years they were joined in battle against the enemies of biometry. Weldon's research career had formed quite independently of Pearson and indeed had provided him a crucial inspiration. As a collaborator, indispensable and coequal, he could never be dominated, and Pearson did not try.

But as statistics became a coherent program under Pearson's charge, disagreement or even independence had less and less place in it. The intersection of dominating personality and missionary ambitions that characterized much of Pearson's statistical career is perhaps most vividly revealed in the relationships, harmonious as well as antagonistic, within his own laboratory. To his loyal staff, "the professor" was the most gracious and attentive of masters. With some of his more expert male coworkers, notably Yule as well as Weldon, private and scientific life were joined as one. Yule learned some Norwegian, vacationed with Karl and Maria Pearson in Norway, and was proselytized into reading, although without much enthusiasm, Nor-

[41] His ambitions, and Greenwood's, for medical statistics are expressed in the KP-Greenwood correspondence, Pearson Papers 707 and 915. On the Medical Research Council, see E. S. Pearson, *Karl Pearson,* 95. On Pearson's medical controversies, see Matthews, *Mathematics and the Quest for Medical Certainty,* chap. 5; Stigler, "Pearson and the Cambridge Economists"; Eyler, *Sir Arthur Newsholme;* Mendelsohn, "From Eradication to Equilibrium."

[42] KP to Yule, 25 Jan. 1895.

wegian authors such as Ibsen and Jonas Lie. In subsequent years, as the operation expanded, Pearson worked hard to make his laboratory an island of statistical comity in a hostile world. He dealt with the proliferation of staff and students by making the rounds every day, discussing the problems faced by each in her or his work. His excellent memory, so they said, enabled him always to recall their progress thus far. He encouraged many, women as well as men, to sign on as coauthors, even when the inspiration was clearly his, and on some occasions, as when most of the laboratory was engaged in calculations to aid the war effort after 1914, he refused to take personal credit but assigned authorship to the laboratory as a whole.

This ethic of collectivism, however, was a double-edged sword. Already by the late 1890s there were definite limits to the independence allowed to his students, former students, and employees, and in subsequent years this was narrowed still further. He always took an interest in the careers and livelihoods of his "coworkers." In the case of the women, this meant trying to be sure they were treated with respect and that their compensation (if they worked for pay) did not fall too far behind what a man in a comparable position would receive. For the men, he was aware that a successful career would eventually mean moving on to an independent position, and often he was a fount of encouragement and support. Yet institutional independence did not imply full scientific autonomy. To depart from the lines of research established by the professor was, almost always, to prove one's lack of competence or ill will, and this led again and again to painful ruptures. The break with Yule, himself an original thinker and a statistician of the first rank, was among the most disturbing. The two fought bitterly over the correlations of discrete variables in contingency tables and about the statistical treatment of time series. When Pearson condemned the generous and well-meaning, if mathematically undemanding, efforts of the Dane Wilhelm Johannsen to use Pearsonian statistics in his biological research on "pure lines," Yule came to his defense. Pearson, who was unimpressed by Johannsen's mathematics and subscribed as an article of faith to the doctrine of inherent natural variability, considered such behavior a betrayal of the biometric way, and of himself as teacher and friend.[43]

The files of Pearson's correspondence with other male collaborators, including Greenwood, Davenport, and Pearl, tell similar tales. The break usually followed an accusation by Pearson of statistical incompetence or ill will. It was always the student who had abandoned true statistics, never Pearson stifling dissent. He would of course not think of discouraging

[43] Yule, "Pearson"; MacKenzie, *Statistics in Britain,* chap. 7; Aldrich, "Correlations Genuine and Spurious"; on the variability of genetic material as a critique of pure lines, see Pearson, *Galton Centenary,* 12; on the controversy generally, see Roll-Hansen, "Crucial Experiment of Wilhelm Johannsen."

independent or original work, but he could not allow *Biometrika* to be the vehicle for publication of flawed statistical analysis, since enemies were always scrutinizing the journal for points of weakness, and defective papers would call into question the whole biometric cause. Sometimes, to be sure, his criticisms were on the mark. But the demand for solidarity went beyond monitoring his students and contributors for errors. He construed every project as part of a collective undertaking.

His women assistants confronted the collectivity with fewer options. They had less prospect of improving their circumstances by moving on from Pearson's laboratory, which in many ways provided them unusual scientific opportunities. Pearson had networks of recruitment at Girton College, Cambridge, the more mathematical of the two women's colleges there. (Bateson's research program in experimental genetics, meanwhile, recruited heavily from among women at Newnham, where the curriculum placed more emphasis on biology).[44] Pearson was steadfast in supporting the right of students at the women's colleges to earn university degrees. He recognized that he could hire the same level of competence for a lower salary, and get greater loyalty or at least continuity into the bargain, by recruiting women. Most, to all appearances, viewed "the professor" with much appreciation. His attentiveness and charismatic demeanor inspired real affection in many cases, and still stronger emotions in some. Julia Bell and Ethel Elderton protested Yule's critique of Pearson's personality, recalling a man of great patience and kindness who allowed his coworkers to maintain independent views.[45] Within months of Maria Sharpe Pearson's death, in 1928, "coworker" Margaret Victoria Child, then in her early forties, accepted his proposal of marriage.

Others faced a situation that could become unpleasant. Pearson regarded them not merely as employees, but as fellow laborers in the Lord's vineyard. Thus Beatrice M. Cave, who aspired to and eventually achieved an independent research career, requested very politely in 1916—a particularly difficult and unhappy period for Pearson—to be released from her contract with the University of London to accept a better position elsewhere. When the job fell through, she informed him that for the time being she wished to stay after all. But he would have none of this. Complaining to the provost of the University of London, Gregory Foster, of her disloyalty, he arranged for a letter of termination. To Cave he wrote acidly that nobody who was scheming to leave had any place in his laboratory, and that her behavior was not in accordance with what public school boys call "playing the game." He would, he continued, never try to hold

[44] Richmond, "Women in the Early History of Genetics."

[45] See letters by Yule, Greenwood, Elderton, and Bell in Box 2, Yule Papers, Royal Statistical Society. These letters make clear that Yule and Greenwood had both been deeply wounded by Pearson's criticism, and also that they regarded him as an almost superhuman figure.

onto his workers, contract or no contract, if "they have not full loyalty to the ideas of our Founder." This last personage was Galton, whom Pearson increasingly invoked in an almost divine role. It was no personal feeling, but the Great Cause, that disallowed Miss Cave's selfish behavior.

From 1920 until his retirement in 1933, Pearson organized a series of annual Galton or biometric dinners to enhance his employees' sense of purpose and often to honor distinguished visitors such as Harald Westergaard or Walter Shewhart. His lectures on these occasions could be elegant and disarming, his facility with words undiminished. When the sculptor Hope-Pinker presented his bust of the professor, Pearson quipped that "looking the bust in the face, I can only say I feel unworthy to have been its prototype." Still, there was something decidedly maudlin about the annual program of toasts, which began: "1. In pious memory of Sir Francis Galton. 2. In Remembrance of all benefactors. 3. In memory of the biometric dead." These were biometric saints, models of self-sacrificing devotion, whose efforts stood as inspiration to the living.[46]

Pearson's expectations and demands did not lead to open controversies with the women in his laboratory. Neither, for different reasons, were his complaints to administrators at University College and the University of London expressed directly as conflict. They found him always quite willing personally to allow some grant funds to be used for other purposes, but absolutely insistent that the intentions of donors, patrons, and founders be respected to the letter. This was no matter of personal greed, for among the diversions of funds he protested was one to increase his own salary. By insisting on the letter of the law he succeeded in 1903 in getting for his Biometric Laboratory the full £1000 offered by the Worshipful Company of Drapers as an annual grant to one or more research project at University College. He was less successful at gaining full control of the 1911 Galton bequest to create a Eugenics Laboratory, and with the anonymous donation by Sir Herbert Bartlett to create space for his growing empire in a new building, largely because the Great War intervened.[47]

A last person, this one masculine, who was subjected to Pearson's inflexibly impersonal commitment to the mission of his laboratory and who could fight back—with effects that in the end were quite devastating—was R. A. Fisher. Pearson had recognized Fisher's exceptional statistical talents from the start, after Fisher submitted a paper to *Biometrika* in 1914. There were some tensions when Pearson refused to publish Fisher's critique of a paper by a biometric associate in 1916, on the grounds that there would have to be a reply, and he could not waste precious space on

[46] See Pearson's wartime diary, with many letters pasted in, pp. 98–104, Pearson Papers 246. On the biometric dinners, see Brautigam, "Inventing Biometry, Inventing Man"; E. S. Pearson, *Karl Pearson,* 108–111; quote on bust from 1928 biometric dinner, Pearson Papers 32.

[47] College Correspondence AM/D/238; Pearson Papers 246.

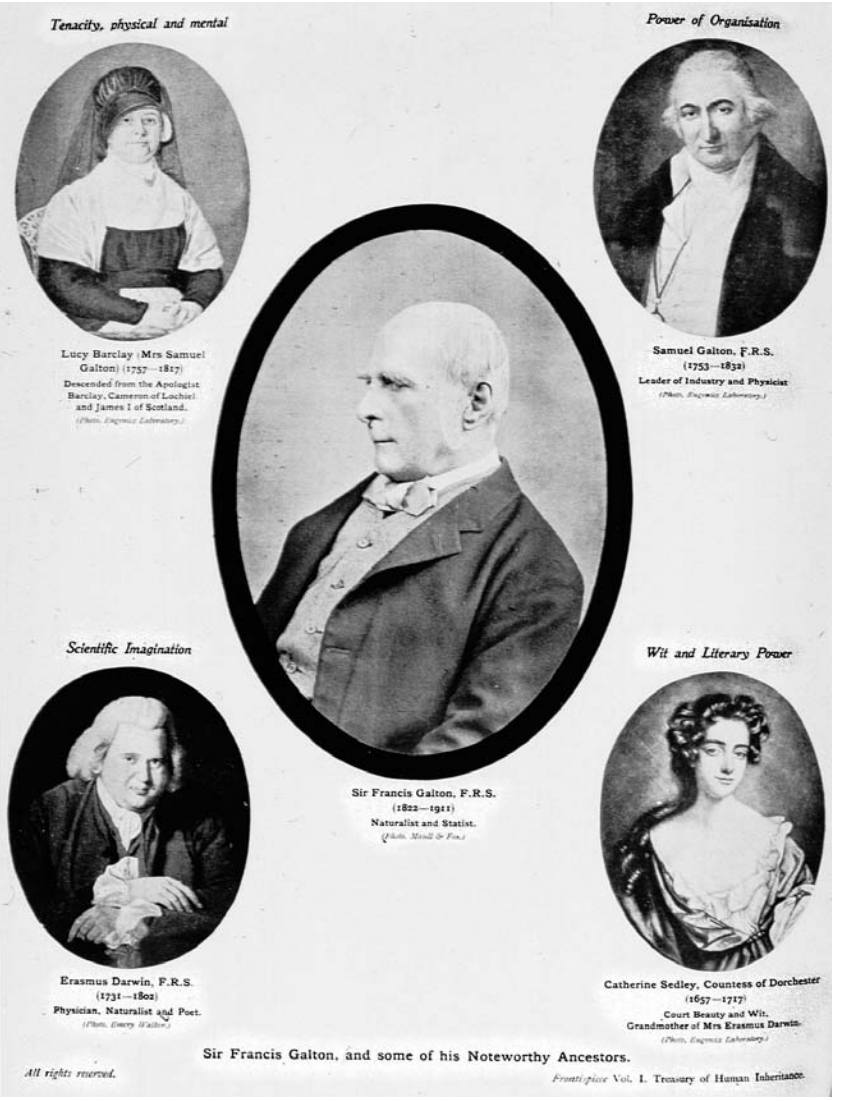

Figure 16. Pearson tracks down the eugenic sources of Galton's talents. (From Karl Pearson, ed., *Treasury of Human Inheritance*, vol. 1, frontispiece, 1912)

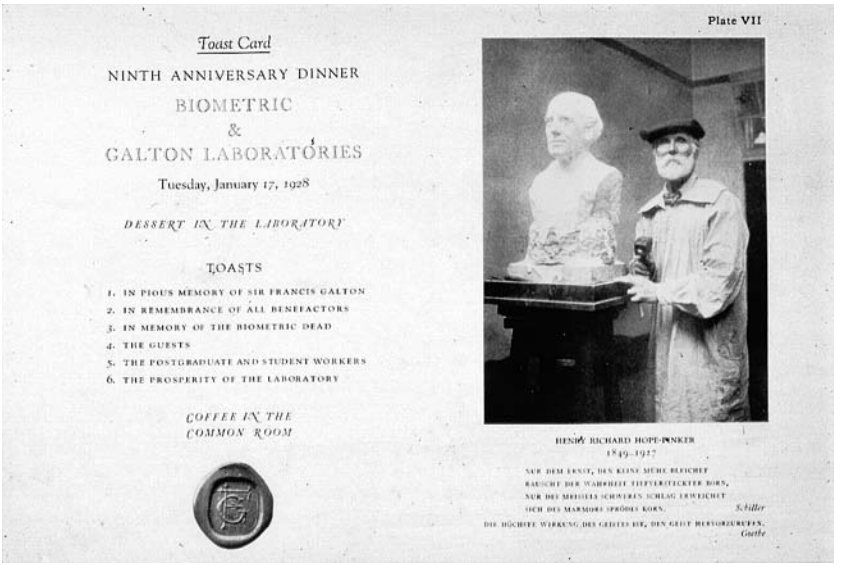
Plate VII

Toast Card

NINTH ANNIVERSARY DINNER

BIOMETRIC

&

GALTON LABORATORIES

Tuesday, January 17, 1928

DESSERT IN THE LABORATORY

TOASTS

1. IN PIOUS MEMORY OF SIR FRANCIS GALTON
2. IN REMEMBRANCE OF ALL BENEFACTORS
3. IN MEMORY OF THE BIOMETRIC DEAD
4. THE GUESTS
5. THE POSTGRADUATE AND STUDENT WORKERS
6. THE PROSPERITY OF THE LABORATORY

COFFEE IN THE COMMON ROOM

HENRY RICHARD HOPE-PINKER

1849–1927

NUR DEM ERNST, DEN KEINE MÜHE BLEICHET
RAUSCHT DER WAHRHEIT TIEFVERSTECKTER BORN,
NUR DES MEISSELS SCHNÖDES SCHLAG ERWEICHET
SICH DES MARMORS SPRÖDES KORN. *Schiller*

DIE HÖCHSTE WIRKUNG DES GEISTES IST, DEN GEIST HERVORZURUFEN. *Goethe*

Figure 17. Hope-Pinker sculpts a bust of Pearson, eight years before he joins the biometric dead. (From E. S. Pearson, *Karl Pearson;* courtesy of Cambridge University Press)

controversy during the war. That same year he wrote a lukewarm report for the Royal Society on Fisher's classic paper (as it now seems) reconciling biometry with Mendelism. In 1919, nevertheless, Pearson offered Fisher a position in his laboratory. Since so much training was required to make even an excellent mathematician into a statistician, he explained, Fisher would have to commit for an extended period, and at the somewhat modest salary of £350. "I want a man who will throw himself wholeheartedly into the work at the Laboratory as it is at present organized," wrote Pearson, not one who would wander off on his own statistical projects. "A real taste for and patience in the somewhat laborious work of computing, tabulating, and reduction is essential. Mathematical knowledge is very essential, but it is in a sense secondary;" the scientific work of the laboratory must drive the mathematics. Pearson of course did not dream of claiming the prerogative to dictate Fisher's career. He merely asked Fisher to enlist his skills in the vital scientific work of the Biometric Laboratory and to put aside all ambitions of a personal kind.[48]

[48] KP to R. A. Fisher, 2 Aug. 1919, Hacker Papers, Box 17; Norton and Pearson, "Note on the Background."

Fisher, for some reason, declined, installing himself instead as statistician for the agricultural field station in Rothamsted, where he developed a brilliantly original scheme of experimental design and statistical analysis. In later years, he became Pearson's most effective statistical critic. His tone, over the years, shifted from bitter to magisterial. In various retrospectives he dismissed Pearson as an unoriginal and sometimes incompetent statistician who overshadowed more capable contemporaries such as Edgeworth and W. S. Gosset ("Student") through his energetic entrepreneurship and self-promotion. Fisher disdained not only Pearson's own work, but a whole tradition, including Yule and Greenwood, which he characterized in terms of fitting frequency curves to observational material. "Modern" statistics, to Fisher, meant tests of significance applied to experimental data—rules of quantitative inference—which he defended by sharply castigating his predecessor.[49] Yet the despised forerunners had introduced the language of statistical significance and with it what the radical mathematician Lancelot Hogben called "the statistician as arbitrator on matters about which trained observers disagree." To Hogben, Fisherian tests of statistical significance were the highest development of Pearson's biometric way, to be contrasted with Jerzy Neyman's efforts to reconceptualize statistical analysis as a direct basis for practical decisions. "Freud too might have called Pearson a father to Fisher," remarked the pioneering Bayesian, Leonard J. Savage.[50]

Eugenics, Evolution, and Statistics

Having come, by about 1885, to regard Darwinian evolution as the great explanatory principle for human history as well as the development of life, Pearson showed a clear willingness in the era of the Men and Women's Club to endorse state intervention in human reproductive decisions in the name of socialism and social efficiency. He did not at that time distinguish sharply between purely biological and cultural inheritance, and so his eugenic commitments were not very explicit before the late 1890s. Galton established and funded a eugenic laboratory in 1906, which soon afterwards fell under the supervision of an ostensibly reluctant Pearson, and

[49] On Pearson and Fisher, see Eisenhart, "Pearson, Karl," esp. 454–457. For Fisher on Pearson, see Fisher, "Professor Karl Pearson and the Method of Moments," *Annals of Eugenics,* 7, part 4 (June 1937), 303–318 (published just two months after Pearson's death); Fisher, "Statistics," in A. E. Heath, ed., *Scientific Thought in the Twentieth Century* (London: Watts, 1951), 31–55, on 34–36; Fisher, *Statistical Methods and Scientific Inference* (Edinburgh: Oliver and Boyd, 1956), 2–4; Fisher, *Statistical Methods for Research Workers,* 13th ed. (New York: Hafner, 1958), 16–17, 22; Edwards, "R. A. Fisher on Karl Pearson."

[50] Hogben, *Statistical Theory,* 328–329; Savage, "On Rereading Fisher," 447.

Galton's will in 1911 led to Pearson's selection as the first Galton Professor of Eugenics. From about 1900 to the outbreak of World War I, eugenic themes dominated Pearson's public addresses and essays. His tone was quotably acerbic, and his arguments were often statistical. Contemporary historical and literary scholarship on eugenics has, properly, placed great emphasis on Pearson's eugenic preaching. In recent decades, eugenics has been widely seen as the real motivation for his statistical work, and even as the force that shaped it.[51]

Galton had tried out eugenic advocacy in the 1860s without getting much response. For the following three decades, he devoted himself principally to the scientific and statistical aspects of "natural inheritance," with the potential eugenic significance of this knowledge always in mind. By 1890 his ideas had become important for researchers on evolution, whether or not they favored eugenics. Eugenics emerged as a popular movement only in the new century. Pearson was among the earliest and most forceful of eugenicists, having warned of the danger of modern reproductive patterns even before 1900. In that year he called on Galton to "take the field for eugenics" and enlisted himself as a loyal deputy. The eugenics movement, which became international, was simultaneously popular and scientific, extending from genetic congresses to fitter family contests at the Kansas state fair. It was as often Lamarckian as Darwinian, and its popularity in Britain and America involved a wonderfully simple Mendelism, conveyed, for example, by placards showing the inheritance of mental defect.

Pearson's eugenic lectures drew deeply from the quantitative idiom of statistics, the science of mass phenomena. "Of a definite child of A and B we can assert nothing with certainty, but of all the children of a definite class of parents like A and B we can assert that a definite proportion will have a definite amount of any character of A and B with a certainty as great as that of any scientific prediction whatever." In his 1907 Boyle Lecture at Oxford on "The Scope and Importance to the State of the Science of National Eugenics," he emphasized the statistical foundation of its objectivity:

> To become a true science, you must remove our study from the strife of parties, from the conflict of creeds, from false notions of charity, or the unbalanced impulses of sentiment. You must treat it with the observational caution and critical spirit that you give to other branches of biology. And when you have discovered its principles and deduced its laws, then, and then only, can you question how far they are consonant with the current moral ideas or with prevailing human sentiment.[52]

[51] Decisive here is MacKenzie, *Statistics in Britain*.

[52] Magnello, "Non-Correlation of Biometrics and Eugenics"; Matthews, *Quantification and the Quest for Medical Certainty,* 126; Pearson, *National Life from the Standpoint of Science,* 18; Pearson, *Scope and Importance of National Eugenics,* 11.

In another lecture, "On the Groundwork of Eugenics," he listed three main points. First: "We depart from the old sociology, in that we desert verbal discussion for statistical facts." Next, we deploy the new calculus of statistics. Finally, we recognize that nature is more powerful than nurture, and that acquired traits are not inherited. From the data of human reproduction, it was plain that the least prosperous, and presumably the least fit, classes had overwhelmingly the largest families. To this he added his measurements of the heritability of human traits, which he found to be very high and virtually the same for mental and social as for physical characteristics. In "Nature and Nurture: The Problem of the Future," he argued categorically that quantification was the indispensable tool of eugenics: "General theories of society are of no use, verbal discussions are no use, philosophical reasoning is no use. We need to observe, measure, and record, to analyze by the methods of exact science, before we can advance in our sociology."[53]

Not all of Pearson's eugenic investigations were founded on statistics. Galton's Eugenics Laboratory was more concerned with tracing family records of disease and other peculiarities than with statistical analysis in the mathematical sense, and even after taking over as its head, Pearson maintained its institutional distinctness from his Biometric Laboratory. The lavish volumes growing out of this work that began appearing in 1907, the *Treasury of Human Inheritance,* consisted of extensive genealogical charts (omitting names) representing presence or absence of various traits, most of them medical abnormalities but also including such characteristics as the attainment of distinction in law and science. The last were of particular interest to Pearson, who evidently compiled those tables, and he also was listed on the volumes as general editor, though the day-to-day work had been mainly supervised by David Heron. Certainly there were interactions, including a regular flow of personnel, between the Eugenics and Biometric Laboratories, and the *Treasury* was also full of information on variability. At the time of his retirement in 1933, Pearson invoked the crucial dependence of eugenics on statistics to challenge the separation of his chair and his laboratories into statistical and eugenic units, under two different professors.

Against Huxley, whose lecture on "Evolution and Ethics" called for civilized interventions to move beyond the inhumanity of nature, Pearson preached socialism and eugenics as the next phase in the biological progress of the human species. Civilization, for Pearson, was the expression and not the antagonist of biological progress. But he was no more

[53] Pearson, *The Groundwork of Eugenics* (London: Eugenics Laboratory Lecture Series, 1909), 19; Pearson, *Nature and Nurture: The Problem of the Future* (London: Eugenics Laboratory Lecture Series, 1910), 7–8.

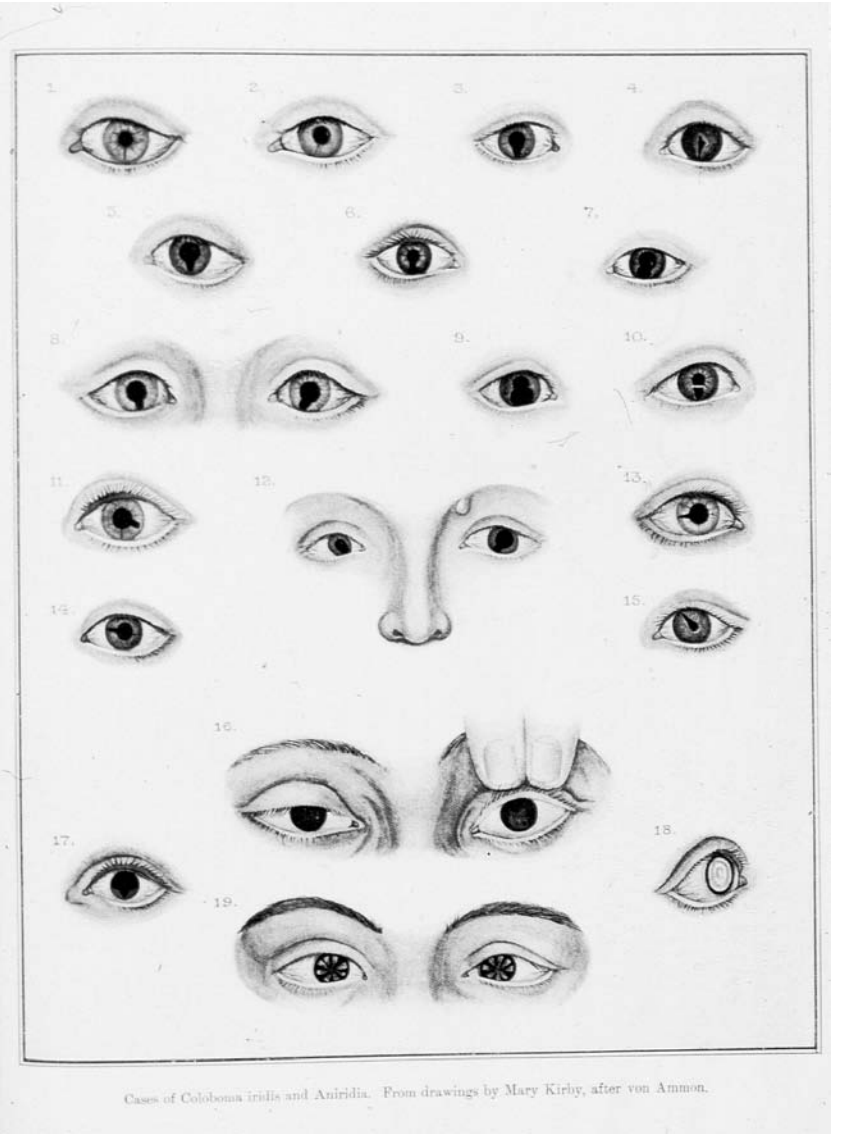

Figure 18. Abnormal eyes: specimen of the work of the Eugenics Laboratory. (From Karl Pearson, ed., *Treasury of Human Inheritance*, vol. 2, part 5, plate P, 1932)

favorable than Huxley to natural selection within society, which, by increasing sickness and starvation among the poor, would promote discontent, disorder, and possibly revolution. Since biological struggle was now principally a competition of state against state, such inefficiencies could be fatal to a whole nation. Pearson was especially provoked by the vast popular success of Benjamin Kidd's *Social Evolution,* a book that drew from contemporary biological thought and from political currents in which Pearson also moved, but that was not the work of a trained scientist. He had no truck with Kidd's individualistic politics, his doctrine that socialism meant biological degeneration. Kidd called for a biological religion as a kind of opiate, to reconcile the unfit to the hardships and restrictions that were unavoidable if natural selection was to continue to operate.

Pearson was not so much a social as a socialist Darwinist, and he saw Kidd's program as retrograde. The replacement of individual struggle with scientific planning was for Pearson the next phase in human evolution. Since social stability, and hence fitness, depended on the health and contentment of working people, Pearson demanded that the rewards of natural superiority be kept within "healthy bounds."[54] Reproduction had to become a matter of policy, to be regulated by science and not by hunger or poverty. To this end, he resurrected his early arguments for state support of child-rearing, now specifying more clearly that provision for motherhood would be limited to cases of "sound parentage." The affirmation of social hierarchy in such arguments has an obvious conservative dimension, but his willingness to make reproduction a matter or social rather than individual choice was still radical. For Pearson, as for many Fabian socialists, eugenics was allied to improved education and a socialized economy, which could only work, they supposed, if the population were intellectually and morally fit. Eugenics would not halt the advance of the finer moral sympathies, but guide them along the paths of efficiency and racial progress. His views typify, or perhaps caricature, the role of eugenics in the birth of the welfare state.[55]

Typical, too, was his support of empire, which in his youth he had disdained as a distraction from the problems of class inequality at home. On practical issues affecting populations near home, a measure of humanity shone through. He demanded that technical and commercial teaching remain fully accessible to the less wealthy members of "the London middle-classes—the democracy of this city." He opposed Christian lectures at University College in the name of preserving it as a welcoming place for students of "Buddhist, Mahometan, and Jewish faiths." Of the more dis-

[54] Pearson, "Socialism and Natural Selection." See Crook, *Benjamin Kidd;* T. H. Huxley, *Evolution and Ethics* (London: Macmillan, 1894).

[55] Pearson, *Scope and Importance,* 25; Paul, "Eugenics and the Left."

tant, however, he spoke with greater scientific stridency, and he unhesitatingly asserted the inferiority of non-Europeans. "No thoughtful socialist," we learn, "would hesitate to cultivate Uganda *at the expense of its present occupiers* if Lancashire were starving. Only he would have done this directly and consciously, and not by way of missionaries and exploiting companies." Many centuries, he argued, had not sufficed for the "Kaffir or the negro" in Africa to produce a civilization that could be compared with the Aryan, and Europeans had every right to move in and make use of the land that native populations could not fitly occupy. To hold back in the name of peace and cooperation would be to halt human progress.[56]

In the early years of the twentieth century, Pearson spoke of the nation being tested by its war against the Boers and failing, and of the need for a scientific, eugenic socialism to improve its efficiency and restore its fiber. He wrote of the "primary duty of the woman to rear strong and healthy children, and the primary duty of the man to carry arms in its defence." He became a vocal champion of educated professionals as against idle aristocrats and the lazy or incapable poor, and he increasingly naturalized class difference. In the relatively open society of railways, schools, and factories created by the nineteenth century, most of the nation's talent had already made its way up the social hierarchy. To those who would challenge this conclusion, imagining there was still a great reserve of ability in the lower classes, he called for quantitative evidence: "Statistics on the table, please."[57]

Pearson's most militaristic phase extended from roughly the Boer War to 1910. Rejecting, as he insisted, the parochial jingoism of the barroom, he instead called for military struggle in the name of science. The pressure of competition was no less essential as a stimulant to progress in the era of social selection than it had been in the earlier era of individualistic natural selection. "Mankind as a whole, like the individual man, advances through pain and suffering only. The path of progress is strewn with the wreck of nations, . . . the stepping stones on which mankind has arisen to the higher intellectual and deeper emotional life of to-day." On occasion he exalted war as a necessary prod to human advancement. "Are not the physique, the intellectuality, the morality of man, the product of that grim warfare between individual and individual, between society and society, and between

[56] Pearson, "Lord Kelvin on Science and Religion," letter to *The Times,* 11 May 1903, 7e–f; Pearson, "The University of London," letter to *The Times,* 17 Dec. 1898, 9a; Pearson, "Socialism and Natural Selection," 111; Pearson, *National Life,* 21, 26.

[57] Pearson, "The Decline of the Birth Rate," letter to *The Times,* 23 Oct. 1906, 3b; Pearson, "National Deterioration," letter to *The Times,* 5 Sept. 1905, 5c–d. He issued this challenge, "statistics on the table," repeatedly, as in another letter to *The Times,* 12 July 1910, 11f, in a debate about the effects of alcoholism (see Stigler, "Pearson and the Cambridge Economists)"; and again in 1912 in his debates with Almoth Wright about the opsonic index (Matthews, *Quantification and the Quest for Medical Certainty,* 110).

humanity and nature, of which we even yet see no end?"[58] More often, though, he spoke of the healthy competition of nations as cultural and economic rather than military, and, as his disenchantment with Germany waxed, he increasingly identified military values with the regrettable dominance of Prussia in the unified German state. Now that a wider European war seemed no longer merely hypothetical, he feared it more and more, and during the actual fighting he called war "an unmixed evil," even if "it is an evil we must at times bravely and unhesitatingly face." He complained of German pretensions to a monopoly on culture, invoked by some there as the ultimate rationale for war, and proclaimed the "international character of all true science." At the same time, he referred with increasing alarm to German economic competition, and called for more liberal support of science in his own country to restore its economic power. Unlike many contemporaries, he seemed more desirous of public respect and appreciation for science than of institutionalized state financing.[59]

What he had imagined in the early years of the twentieth century to be the voice of an Old Testament prophet, challenging English complacency with his calls for a more efficient state, has been understood retrospectively, and not without reason, as pandering to the worst forms of national imperialism. Near the end of his life, in 1934, he once even spoke with seeming indulgence of Hitler's vast eugenic experiment, which, however, would probably fail because the Germans were still novices in modern statistics. Possibly this was a joke gone awry, for there is no other evidence in his writings of fascist sympathies, and a letter the same year suggests that he found the Nazis intolerable.[60] Still, his political standpoint for decades was almost unremittingly harsh and disdainful of the gentler sympathies. In his most moralistic moments, he could hector a middle-class audience for the self-indulgent habit of choosing marriage partners on the basis of superficial love rather than thinking of the future of the race.[61] On the other hand, he was never the man on horseback, never the leader of a movement. While appealing to eugenics to halt the catastrophic racial decline of his own nation, he called for further study rather than precipitate action.

He was always, in his self-conception, the man of the study and not of the marketplace, one who endorsed scientific enthusiasm but political cau-

[58] Pearson, *National Life,* 64; Pearson, *Scope and Importance,* 22.

[59] Pearson, "The Philosophy of Natural Science," *Nature,* 55 (11 Nov. 1896), 1–4, on 1; also two unsigned contributions during the war to *The New Statesman:* "Germany in the Eyes of an Onlooker," vol. 3 (22 Aug. 1914), 608–610; and "Wie steht's mit der deutschen Cultur," vol. 4 (10 and 17 Oct. 1914), 9–11 and 33–35, on 33–34. See also Alter, "Bewunderung und Ablehnung"; Alter, *Reluctant Patron.*

[60] *Speeches at a Dinner,* 23; KP to Raymond Pearl, 6 Nov. 1934, Pearl Papers.

[61] See Pearson's manuscript lecture on eugenics, 1923, in Pearson Papers 79/1.

tion. The man who in 1879 was flummoxed by the demand to inscribe his faith in a box on the registration form at Heidelberg, wishing instead to explain himself in a treatise on religion, had changed little by the early twentieth century. Pearson so loathed the thought of being confined within someone else's movement that he could not even remain loyal to his own. Once his doctrines showed signs of becoming popular, he began immediately to doubt them, or at least to question the competence of his followers. He sneered at the propagandistic efforts of the Eugenics Education Society and chided Shaw for supporting the immediate implementation of radical eugenic measures from which the founder of eugenics himself, Galton, had drawn back. Shaw should remember, Pearson declared, that eugenics, like socialism, must penetrate gradually, without alarming mankind unduly. In 1913, he wrote to *The Times* that the science of race efficiency had been turned by early popularization into a subject for "buffoonery," and that the need of the present was for the academic and not the popular side of the movement. Eugenic politics required a level of scientific knowledge that was not yet in place, he thought. At the peak of his eugenic extremism, in 1904, he told the Sociological Society that eugenics remained a "question of the study now, but to-morrow it will be the question of the market-place, or morality and politics."[62] When he died in 1936, this tomorrow had still not arrived.

Pearson's eugenics "of the study" consisted in practice of hortatory speeches drawing from the analysis of public statistics, supported by biometric measurements and other researches into heredity. His statistical program was unmistakably linked to his eugenic commitments, but not as effect to cause. The bond was loose and reciprocal, mediated by a deep devotion to a quantitative science of biological evolution. It was evolution that had excited him so in 1893 when he began to envision a scientific career in statistics. His sense at this time of eugenic entailments was vague and indirect, subsumed in his exultation that he, an applied mathematician of uncommon ambition and dilettantish attainments, might take a commanding role in advancing the most original and comprehensive scientific theory of the nineteenth century. In 1896, when he and Galton began discussing eugenics, he professed surprise that his own studies showed the action of natural selection to be overwhelmed by human fertility differences. It must be muddled somewhere, he told Yule, perhaps disingenuously;

[62] On the Eugenics Education Society, see Leonard Darwin to KP, Pearson Papers 673/6; Pearson, *Life of Galton,* vol. 3, 362, 371–372; on Shaw, see ibid., 260; on buffoonery, see Pearson, "The Position of Eugenics as a Science," letter to *The Times,* 15 Oct. 1913, 4e; on study and marketplace, see Pearson, *Life of Galton,* vol. 3, 262; also Solovey, *Demography and Degeneration,* 32, 73.

"otherwise there is another nail in the coffin of natural selection as applied to civilised man." Not even in private documents did he reduce the importance of statistics to eugenics. His correspondence with Weldon, his inseparable biometric collaborator, is silent on eugenic issues.[63]

From the early 1890s, he explored the whole range of scientific fields that might be reshaped by statistics. Some of his earliest statistical papers addressed meteorological and astronomical topics as well as biological, anthropometric, and social ones. Two weeks after Galton's death, in 1911, Pearson told Greenwood that statistics, not eugenics, was the most important of Galton's contributions, since "the spirit of mathematics must inform *all* science." When his second volume on Galton's life came out, he worried that Galton's reputation was linked too narrowly to his eugenic advocacy. "The ordinary reviewer has no other thought in his mind than 'Galton & Eugenics,' which is far from the whole story." Statistics, after all, "is almost the Novum Organon of all true sciences." The development of ideas inspired by Galton, he announced in a centenary appreciation, was leading to a "revolution in scientific logic," one that would "ultimately produce a renascence in every science in which statistics plays a part," in short "every branch of modern knowledge." But then he seems to have regretted this distancing from eugenics, and in the published version of this same lecture he omitted the sentence just quoted. If, he asked instead, we take away Galton's contributions to eugenics, "what is there left to honour him for?"[64]

The Aristocracy of Science

What sort of science would statistics advance? What should be the role of science in an age of statistics? Pearson's ambitions were characteristically exalted and have become almost unimaginable. He believed in scientific expertise, but equally in science as the basis of wisdom. Although he adhered to an ideal of scientific selflessness and renunciation, he thought it perfectly consistent with the cultivation of individuality. His utopia would have been a very special kind of scientific culture, led not by mere specialists but by moral leaders who rejected blind faith in favor of the naturalism and rationality of scientific method.[65]

[63] KP to Galton, 2 Jan. 1896, Galton papers 293/B; KP to Yule, 30 Dec. 1895; KP to Galton, 10 Jan. 1901, 25 Oct. 1906, Galton Papers 293/E–G.

[64] KP to Greenwood, 3 Feb. 1911; KP to Pearl, 3 Oct. 1924; KP to Greenwood, 14 Aug. 1920; Pearson lecture on Galton, 1922, Pearson Papers 32; Pearson, *Galton Centenary,* 17; Magnello, "Non-Correlation of Biometrics and Eugenics."

[65] Parts of this section are based closely on Porter "Statistical Utopianism."

To define more circumspectly the significance of Pearson's commitment to eugenics is not to displace him from the practical or political world. He scarcely believed in pure science; he was unmistakably an applied mathematician, and proud of it. In the 1890s, when he took up statistics, Darwinian evolution was for him the leading edge of advancing rationality. This was less for eugenic than for religious reasons, a liberation from theology. Science he viewed as a jealous God, which brooked no rivals. Although he made a habit in his maturity of writing off the battle between science and religion as now otiose, this stance was premised on the optimistic assumption that, in the march of historical progress, Christianity had already been vanquished and might now be preserved in its little enclave, a museum with a fence around it. But the inmates, who included such nonnegligible personages as Gladstone, Salisbury, and Balfour, stubbornly refused this confinement and threatened to mislead millions with their challenges to Darwinian naturalism and their reaffirmation of design in nature. The reactionary, because religious, view of science put forward by these political worthies in the mid-1890s bothered Pearson all the more because Lords Salisbury and Balfour were prominent in the new conservative government, which he despised. That their scientific arguments were endorsed by great physicists such as Kelvin appeared to Pearson to be part of an insidious movement that was impeding the ascent of science in public life.

In the face of such arguments, Pearson counterattacked with bitter sarcasm, impugning motives as well as competence.[66] The new age would have no more place for an archaic natural theology than for an outdated materialism. Instead, the world was a scene of human activity and labor, a collective effort to find meaning by making truth and to gain success by achieving efficiency. Rationality seemed a new and fragile thing. Not until Darwin, he claimed, in a rare historical lapse, did mankind outgrow the mythology of a moment of divine creation in 4004 B.C. The human spirit was liberated by such discoveries, and science should fight for them.[67]

There were other obstacles to the new order. Pearson had no sympathy for fin de siècle spiritualism, especially when it claimed the backing of science. He complained of the physicist Oliver Lodge's participation in the Society for Psychical Research, discerning, he believed, a seeker after mystical truth rather than a disinterested inquirer. To mix science with such mysticism disturbed him as much as claiming a rational basis for religion, and it was all the more dangerous because statistical analysis of spiritualist

[66] For example Pearson, "Politics and Science," *Fortnightly Review* (1894), and "Reaction" (1895), both reprinted in *Chances of Death,* vol. 1, 173–255.

[67] Pearson, *Charles Darwin: An Appreciation* (London: Questions of the Day and of the Fray, 12, 1923).

experiments had already in the 1890s assumed a prominent role in this discourse. H. G. Wells, a fellow skeptic, instanced the low social rank of mediums and witnesses and the incapacity of statistics to detect slight effects as reasons to reject claims for psychical phenomena. Pearson preferred to doubt for other reasons. "If, to suppose an instance, the greatest living anatomist were to announce that he had dissected a dogfish and found lungs therein, adduce his wife, a local general practitioner, two servants, and a lady named 'Miss Z.' in evidence, and add that he had lost the specimen, there can be scarcely any doubt that, in spite of his position and his character, the science of anatomy would remain exactly where it was before his discovery was proclaimed." The high odds achieved by these psychical experiments were "significant, very significant," but what they proved was "lack of psychical acumen, and not telepathy."[68] Pearson was among the most ardent of scientific naturalists, and in the early 1890s statistics was especially appealing to him as a bastion of support for the creed of science.

The growing role of quantification and calculation in the world since Pearson's time has been achieved mainly in the guise of self-effacement, as a set of methods made impersonal by the strict logic of rules and conventions that govern their use. Statistics, by reputation, supplies a protocol for seeking answers to comparatively narrow and clearly formulated questions. Its domain is factual, not ethical, and it is wielded by specialists, not by statesmen and intellectuals. But Pearson saw the future of this new mode of science in terms more compatible with the social and political hierarchies of his own time, as a basis for thought and action among the leaders of society. His culture did not idealize rational bureaucracy, infinitely subdivided, but invested authority in elite generalists. An ambitious champion of a new scientific organon naturally aimed to seize the opportunities presented in his own world, and a history that presupposes the bureaucratic structures of the late twentieth century, will inevitably miss the point.

There is no doubting that Pearson wanted to build statistics as a field, one that would, for example, provide posts for the students he set out to train. He was not so sure about the "discipline," a form of scientific organization that he identified with the scientific narrowness of contemporary Germany. His frequent references to plodding Germans supplied the exemplar of what his science should not become. He complained in 1895, and then for decades afterwards, that "in the great research machine of Germany there is scarcely more room for originality than in the great political machine." The German system had been reshaped to train only the *Fachmann,* the disciplinary specialist, and had lost its capacity to educate "the men who wield imagination in science. . . . It is not a display of minu-

[68] Pearson, "Peculiarities of Psychical Research," *Nature,* 50 (13 Dec. 1894), 153; also *Nature,* 50 (27 Dec. 1894), 200.

tiaea but an education in the use of the mind that the university must provide."[69]

The point was of course not to deny the value of scientific expertise, but to comprehend it in relation to the wider domain of knowledge. On this, as on so many topics about which he felt passionately, he was torn. He believed deeply in the need for specialist training. In his grand utopian project for scientific education, "The Function of Science in the Modern State," published originally as the preface to a supplementary volume of the *Encyclopaedia Britannica* in 1902, he invented a magnificent hierarchy of scientific schools. At the bottom were programs for shepherds and milkmaids, whose work could after all be made more efficient. This was a kind of scientific management, but with a difference, for they would not receive mere instruction in routines. Instead, their education would emphasize principles, including an introduction to scientific method, to make them adaptable and creative rather than machinelike practitioners of the agricultural arts. Further up the hierarchy he imagined secondary and higher craft schools, commercial schools and universities, technical universities, law and medical schools, and schools for statesmanship. At the scientific summit were national laboratories and institutes in every field of science, including technical and medical ones. Throughout, his principle was consistent. Pure science should not be particularly emphasized, except for the training of research scientists. The point was to focus on technical subjects, but to teach in such a way that even the lowliest and narrowest study became an exemplification of scientific method. "The recognition of this fundamental fact is the reformation which must take place in academic studies."[70]

Even for technicians and others on the intermediate levels of prestige, his protocol required deliberate efforts to broaden their curriculum. They should receive an introduction to comparative history and folklore; they should learn foreign languages, set off if possible on a *Wanderjahre,* and participate in athletics. As much as possible, especially for elite students, education should be a process of exploration akin to research. This was the great German university ideal of the early nineteenth century, now, so far as Pearson could see, largely lost. His career was in a way an effort to restore it in a new form, a campaign against excessive narrowness. In "this day of specialization," he wrote late in life, a wide-ranging intellectual preparation such as Galton's had become all too rare. Of course he was

[69] Pearson, "Academic Germany—A Puff" (unsigned review of Friedrich Paulsen, *The German Universities*), *Saturday Review,* 80 (1895), 271. See also "Wie steht's mit der deutschen Cultur." He often criticized German science in his letters, e.g., KP to Weldon, 9 Oct. 1900; KP to Yule, 30 Aug. 1896; KP to Greenwood, 17 July 1904. On statistical posts, see Pearson, *Life of Galton,* vol. 3, 381.

[70] Pearson, "Function of Science," quote on p. xxv.

thinking also of himself, and as he became more secure about his own early failure to specialize, he spoke with growing conviction of the need for competence in many fields to investigate such vital problems as evolution. He condemned what he saw as the plodding style of textbooks, and refused to write any of his own. Even for those unambitious mediocrities who must make up the majority of students, it was the mission of the teacher to force them to think for themselves. Superior students, driven by a thirst for real knowledge, would demand the deeper understanding that science could provide.[71]

Pearson's own teaching, convincingly described as brilliant by various observers and former students who were in no way blind to his flaws, was a creative synthesis of the newest ideas and methods. When he began lecturing in statistics, in 1894–95, he presented not the standard mathematics of probability or error theory, but his own research in progress, work that would transform the field. His ideal of the statistical laboratory was to get beyond the limits of any classroom, to provide a space where the student "learns to handle his own material."[72] And the education of a statistician should not be limited to the merely professional. Late in his career he relied on history to connect statistics with the broader currents of social and intellectual life, as well as to inculcate an ideal of a life in statistics. The teacher, he believed, should educate the whole person, and for Pearson it was a tragedy when a good mathematician knew only mathematics.

His disdain for the commonplace and the formulaic reflected his missionary ambitions, "the gospel that statistics formed the narrow path, which would lead to salvation." This theme pointed back to his youth, when he held up the "enthusiasm of the study" as his noblest life purpose. His lectures on the history of statistics bemoaned the reduction of science to a mere profession, another road to a respectable living. In more heroic times, the banner for science and statistics was carried by men like Edmund Halley, a passionate investigator: "We are not dealing with a professional scientist, a professor sitting in his chair and earning his living by teaching and doing a reasonable amount of research to maintain his reputation. No, we have something quite different; Halley was a man for whom the whole book of nature had absorbing interest." The eighteenth-century mathematician Thomas Simpson, by contrast, was a scoundrel, supporting himself by converting De Moivre's great discoveries into textbook routines. "We are passing from the scientific enthusiasm of the

[71] Pearson, *Galton Centenary,* 8–9. For his opposition to textbooks, see his complaints about one that Davenport was writing, reflecting his doubts of Davenport's biometric competence: Davenport Papers, American Philosophical Society.

[72] See KP's lecture at a dinner for Harald Westergaard, 9 March 1925, Pearson Papers 32; the words quoted were spoken in praise of Westergaard's Copenhagen laboratory.

founders of the Royal Society to a period when men followed science as a profession." It was a sad transformation. "Science as a pursuit must always stand higher than science as a profession."[73]

Pearson's idealized man of science was creative yet disciplined, a Kuhnian *avant la lettre*. "Fruitful new hypotheses have almost always been the product of master-minds, which have worked out old theories to the point at which they are seen to absolutely contradict phenomena. The 'prentice hand finding some new fact at present unaccounted for by the old-established theory is generally over-hasty with the fabrication of a new hypothesis."[74] Such bold theorization had, in Pearson's telling, a class dimension. His exemplary scientific heroes were not men of the professional middle classes, but Darwin and Galton, whose inherited wealth allowed them to be true to science and keep free of the petty corruption and careerism that were increasingly prevalent in the sciences as in so much of life. For himself, a university professor, it was a struggle to remain aloof from all the little distractions and temptations of the academic world.

In political terms, too, he thought increasingly of the proper role of science by analogy to the traditional standing of the aristocracy. As early as 1887 he had written of the need to "aristocratise government at the same time as we democratise it; the ultimate appeal to the many is hopeless, unless the many have foresight enough to place power in the hands of the fittest."[75] In the twentieth century, his revisionist aristocracy took the form of a concrete if whimsical proposal initiated by Francis Galton to reconstruct the House of Lords on the basis of hereditary merit. Neither man thought much of the British hereditary elite as then constituted. Still a socialist, Pearson had even less respect for the achievements of men of business, and none at all for mere wealth as an index of capacity or achievement. Surely there were better ways to maintain the House of Lords than to appoint grasping plutocrats, tradesmen, and failed cabinet ministers. His admiration went out to scientists, scholars, artists, statesmen, and administrators, and he imagined that an upper house might be formed from the most accomplished of them. Neither Galton nor Pearson believed that hereditary transmission should be perpetual, certainly not for those whose descendants were mediocre, but the hereditary principle admitted a eugenic defense. Pearson invoked "the truth drawn from observation that,

[73] Pearson, *History of Statistics,* 95, 176; KP speech at dinner for Mr. and Mrs. Walter Shewhart, 5 May 1932, Pearson Papers 32; Pearson, *Life of Galton,* vol. 2, 154–155.

[74] Pearson, "Philosophy of Natural Science" (note 59), 2. On Kuhn's reading of Pearson, see the first of his Lowell lectures (delivered March 1951), Box 3, folder 1, Kuhn Papers, MIT (I thank Karl Hufbauer for this reference).

[75] Quote from Pearson, "The Moral Basis of Socialism" (1887), in Pearson, *Ethic of Freethought,* 306. On the opposition of Victorian moralists to selfishness, see Collini, *Public Moralists,* 65.

for good or bad, children, in a certain marked and measurable degree, resemble their parents."[76]

On occasion he endorsed the inclusive view that the "aristocracy of worth" was "not confined to any social class; it is a caste which is scattered throughout all classes; let us awaken it." At other times he took the caste notion more literally, suggesting that through selective breeding and differentiated education it would be possible to cultivate distinctive scientific, political, and commercial elites.[77] This language of inheritance was, however, always subordinated to meritocracy, the proper course "between the Charybdis of Democracy and the Scylla of an Hereditary Peerage."[78] He would require that family abilities prove themselves in every generation, demonstrating intellectual and moral worth through high-level service to society. Carlyle's ideal of the hero and hero worship, which appealed so strongly to men of science in Galton's generation, remained attractive to Pearson.

Although science was far more central to Pearson's ideal of the Carlylean hero than in the original, he did not think that scientists should be placed in charge of the apparatus of state. He merely insisted that their knowledge should guide public decisions of all kinds, and that a proper scientific education was indispensable for every person in a position of authority. He adopted a tone of almost desperate urgency. What the country needed was effective organization, a centralized state that could avoid the chaos of economic competition at home to achieve efficiency in the struggle abroad. Britain has "the flesh, blood, and sinews of a nation, but to make it foremost in the struggle, to make it a homogeneous, highly-organized whole, you must have a complex nervous system." By nervous system he meant knowledge, or science, "that classified experience which we term wisdom." Not religion or dogmatic philosophy but only scientific study could identify the requirements of continued progress and establish a sound morality. He despised all talk of "rights of man," calling instead for a "social morality," founded on "the solid ground of human history, human experience, and a knowledge of human nature."[79] Although his vision included a place for specialized experts, each assuming responsibility for a domain of particular competence, this would not suffice at the top of the hierarchy. Pearson adhered to a somewhat traditional view that the ruling classes were qualified by supple, disciplined minds, hereafter to be formed by a grammar of science. As he explained to an audience at Oxford, he envisioned the higher statistics as an indispensable part of their mental equipment.[80]

[76] Karl Pearson, "Primogeniture and Heredity," letter to *The Times,* 31 March 1910, 8.

[77] Pearson, *Galton,* vol. 2, 93–94; vol. 3A, 353; Pearson, *Function of Science,* ix–xi.

[78] Pearson, *Galton,* vol. 2, 122.

[79] Pearson, *National Life,* 33, 54, 13–14; unsigned review of two books on socialism, *Saturday Review of Politics, Literature, Science, and Art,* 79 (1895), 130–131.

[80] Pearson, *Scope and Importance.*

This notion of a scientifically literate elite was, in his time, more plausible as a strategy for bringing together knowledge and power than any scheme for a tyranny of expert specialists. The period has too often been characterized in intellectual histories of the late Victorian and Edwardian periods, especially when they turn to social Darwinism and eugenics, as straightforwardly an age of science. Although scientific education was widely advocated, especially in the aftermath of the disastrous Boer War, as an answer to national decline, the political elite continued to come up mainly through Eton and Oxford, equipped with a classical education rather than a scientific one.

Winston Churchill wrote in 1902 to H. G. Wells in response to his *Anticipations of the Reaction of Mechanical Progress upon Human Life and Thought:* "Nothing would be more fatal than for the Government of States to get in the hands of experts. Expert knowledge is limited knowledge, and the unlimited ignorance of the plain man who knows where it hurts is a safer guide than any rigorous direction of a specialized character."[81] Churchill's protest has been dismissed by modernist-minded historians as the vain effusion of a man now out of his time. Many contemporaries were not so sure. Pearson related a pertinent anecdote to Weldon in 1901: "I heard a good tale the other day from a Civil Service Examiner. The heads of the Commission were asked why 75 p.c. of the appointments were given to Oxford literary school men. They replied that there were only 25 p.c. of the civil service appointments wherein gentlemen were unnecessary; they accordingly were not able to give more than 25 p.c. of the civil service appointments to mathematics & science. How in the world is the country going to survive under such a regime?"

After the First World War, Pearson explained his ambitions very clearly, and in print. The state must be freed from minds trained in literature and jurisprudence. The function of science extends to every branch of administrative activity. But this was the vision of a disaffected man, not his description of current reality. Neither did Wells imagine that experts had as yet acquired much influence. "The modern democracy, or democratic quasi-monarchy, conducts its affairs as though there was no such thing as special knowledge or practical education. The utmost recognition it affords to the man who has taken the pains to know, and specifically to do, is occasionally to consult him upon specific points and override his counsels in its ampler wisdom."[82]

[81] Letter, 17 November 1902, quoted in Harold Perkin, *Rise of Professional Society,* 169.

[82] KP to Weldon, 6 Jan. 1901; Pearson, *The Function of Science in the Modern State,* 2d ed. (Cambridge: Cambridge University Press, 1919), preface to 2d ed., vi; H. G. Wells, *Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought* (New York and London: Harper and Brothers, 1902), 167.

Churchill's disdain for mere experts confirmed Wells's assessment of the standing of the man of science in relation to higher affairs of state. Pearson's story, implying that mathematicians could not be gentlemen, recalled the charge that so vexed T. H. Huxley after he himself had assumed the tenuous role of statesman of science: "How often have we not been told that the study of physical science is incompetent to confer culture; that it touches none of the higher problems of life; and, what is worse, that the continual devotion to scientific studies tends to generate a narrow and bigoted belief in the applicability of scientific methods to the search after truth of all kinds? How frequently one has reason to observe that no reply to a troublesome argument tells so well as calling its author a 'mere scientific specialist.'"[83] Huxley countered that science is vindicated by its utility in practical life, but also by asserting the need for general understanding of science in an increasingly scientific age. He thus answered critics such as Matthew Arnold not by contesting the importance of culture, but by asserting the claim of science to an important part of it. Science could not be limited to scientists or walled off from the rest of life. The very term "scientist" suggested a soul too confined. "To any one who respects the English language, I think 'Scientist' must be about as pleasing a word as 'Electrocution,'" he wrote in 1894. Perhaps he supposed, as did many "men of science" of his generation, that this term, although in fact coined by William Whewell half a century earlier, was one of those execrable Americanisms by which the language was being corrupted.[84] In a cultivated country, on the eastern shore of the Atlantic, science could be refined as well as practical.

Expertise among the Victorians was indispensable, but also, as Wells noted, rather lowly. The word is related etymologically to "experience," and in the nineteenth century an "expert" was more likely to be a person who did things than someone who had formally studied them. In educational terms, expertise was acquired principally by practical training rather than by scientific schooling. It was the domain of specialists and suggested narrowness and the distortion of personality, the fashioning of students into useful tools rather than educated persons. As Wells put it: "The man of special equipment is treated always as if he were some sort of curious performing animal."[85] Pearson's more elevated ideal did not exclude an engagement with practical problems. He held that the study of steam engines or bridge structures could be "more expansive to the mind" than theoretical mechanics, and it was in such terms that he justified it. Science,

[83] Thomas H. Huxley, "Science and Culture" (1880), in Huxley, *Science and Education: Essays* (New York: Greenwood Press, 1968), 134–159, on 140–141.

[84] Ross, "Scientist."

[85] Wells, *Anticipations,* 168.

including technical science, remained for him an aspect of culture, to be taught along with literary subjects at universities.[86]

This ambition, to merge technical education with science and even letters, can scarcely be called successful in Pearson's time. But the alternative, to invest public authority in highly specialized technicians, was still less promising. Mere expertise was perhaps never more strictly subordinated to general culture than in the decades around 1900. The Northcote-Trevelyan reform of the British Civil Service, implemented by Gladstone in 1870, established an examination system for government officials that gave all the advantages to Oxbridge. An expert, in the new system, was examined on knowledge relevant to his post, then worked his way up through the lower ranks on the basis of practical experience. Further advancement into the higher ranks for these specialists was not contemplated. The upper levels were filled by men of general culture, as displayed by their demonstrated competence in elite academic subjects, especially classical languages, modern languages, and mathematics.[87] The new upper civil servants regarded public service as a calling. Rather than advancing within a single department, they followed a career track that moved from ministry to ministry. The intellectual capacity to adapt almost instantly to a new domain and the moral integrity to administer selflessly were most valued by this system. The best qualification for the upper civil service was understood to be a classical education. Huxley and Pearson would have science take over this role.

In science, as in administration, the late nineteenth century was in Britain a time of professionalization based on meritocracy. Scientific professionalism meant the growth of universities and an increasing number of university posts, and the restriction of scientific bodies, most notably the Royal Society, to a more selective membership. It also meant a greater distance between the scientist and the public, the narrowing of Huxley's Victorian role as public man of science. Through such social processes, and through the mixing of science students from good families with literary ones at public schools and Oxbridge, the social standing of science did advance somewhat during Pearson's lifetime. Even statistics and related tools of quantification experienced a modest efflorescence. But it was more nearly the assimilation of elite scientists into the upper classes than a triumph of specialist expertise.

Pearson supposed correctly that enhancing the status of science meant joining it to the formation of elites. But he could not be much encouraged

[86] Pearson, "The Proposed Technical Institute at South Kensington," letter to *The Times,* 13 Feb. 1906, 7b; Pearson, "The Proposed English Charlottenburg," *The Times,* 14 July 1905, 15b–c.

[87] Roach, *Public Examinations in England;* Kelsall, *Higher Civil Servants in Britain,* 60–62; Gowan, "Origins of the Administrative Elite."

by the very slow progress of this educational cause, and of the social transformation that would attend it. Not only the literary men, but even students of science, seemed incapable of seeing its cultural significance. Could the scientist be more than a trained monkey, competent to do just what he had been taught, and lacking vision, suppleness, and wisdom? In an age of advancing specialization, the obstacles to making scientific education into liberal education were disheartening. The seeming incapacity of scientific memory to grasp the deep commitment and complex personal development at the heart of a successful scientific program frustrated him equally. The denial of complex individuality to the scientist and the refusal to see men of science as possessing the dignity and well-roundedness that would fit them for high office were closely related. A scientific life was as much a bildungsroman as a career in art, literature, or politics. Why did posterity insist on reducing it to an eponymous discovery or equation, a mere name with all the life left out?

CHAPTER TEN

Epilogue:

COMPOSING A LIFE

> Today socialism is trying to declare the beloved private self to be a worthless illusion, which should be replaced by social causes and duties. But in this it had long since been preceded by the natural sciences, which dissolved precious private things into nothing but impersonal processes. . . . Psychologically . . . one has already gone so far as to dissolve the person into typical bundles of typical averages of behavior. Sociologically, he is treated no differently.
>
> —Ulrich in Robert Musil, *The Man without Qualities,* p. 1617.

KARL PEARSON'S WAS a literary life of devotion to truth. From youth he had understood his development as a bildungsroman, a character formed through diverse experiences who is yet never dominated by external circumstances. He composed his life self-consciously as akin to a novel and more than once portrayed it in writing as an actual work of literature. In his later years he may have felt the justness of Shaw's dramatic title: "Karl Pearson: A Tragedy." He felt this tragic dimension most acutely during those periods of depression provoked by the deaths and other losses that punctuate human existence. What had his tireless dedication to science really accomplished, in the end? He was bothered especially by the question of immortality, by then understood mainly as an issue of memory. He feared, prophetically, that the passions, ambitions, and achievements of his career would be reduced to eponymous labeling of a discovery, and all the "toil of the years," the expansiveness of his life, work, and vision, forgotten. In 1929, he was asked by an early historian of statistics, Helen Walker of the Columbia School of Education, how he should be represented in a source book she was planning. He must have responded by insisting on the unity and coherence of his work. No particular paper, she agreed, could give a valid impression of the totality of his writings. "We shall certainly respect your preference not to be 'fragmentised.'"[1]

[1] Helen M. Walker to KP, 15 Jan. 1929. On these issues generally, see Shortland and Yeo, eds., *Telling Lives in Science.*

Pearson believed, with cultural historians of his generation, that the individualized "self" was not timeless but had arisen in Europe with the waning of the Middle Ages. However deep was his admiration for the socialistic ethos and economy of pre-Reformation Germany, he understood the emergence of individuality as a necessary and, ultimately, beneficial phase in the progress of humanity. But in the age of professions and of mass society, the rising social order that, according to his anticipation of human progress, should combine personal development with collective organization, the unity and wholeness of self seemed increasingly threatened. Perhaps, as the line quoted above from Musil's sprawling and unfinishable novel implies, science had long since arrived at the same conclusion. But Pearson was bothered by a different aspect of science from Musil. In the quoted passage, Ulrich discussed persons as objects of science, the reduction of will, spirit, or mind to a material substrate on which causes act. Pearson firmly denied all through his life that scientific explanation was a threat to human dignity. "The mechanical theory of the universe is the idealism of science, not its realism."[2]

Not the metaphysics of science but the increasing narrowness and thoughtless careerism of its practitioners defined Pearson's tragedy. In science, as Arthur of *The New Werther* had complained in 1880, it was possible to live a life that would be recalled for nothing more than the invention of an integral. This was not renunciation, which could only be practiced by a coherent and purposeful self, but liquidation. In an increasingly professionalized enterprise, it was becoming ever easier to *be* little more than the inventor of an integral. Huxley, Pearson, and other scientific stalwarts resolutely opposed the procrustean compression of self into the cramped frame of some specialty or strict methodological prescription. Yet Pearson's position was a deeply ironical one. His work undoubtedly helped to form what was, in the early twentieth century, virtually a new human type, the scientist, social scientist, engineer, or manager who regarded legitimate thought as equivalent to strict, impersonal quantification. Even within the tribe of professional quantifiers, it has generally been regarded as eccentric, though it is by no means unknown, to extend the doctrine of quantitative rationality to intimate relationships and aesthetic judgments.[3] At the other extreme, some quantitative purists would rigorously separate personal from scientific life, allowing an uninhibited emotionality to fill whatever spaces are not accessible to number and calculation.

[2] Pearson comments on the "influence of realism in literature and art on morality," Pearson Papers 35, ca. 1900–1905.

[3] See Espeland, *Struggle for Water*. Ken Alder meditates on statistics and the changing definition of the scientist in *Measure of All Things,* 305–308.

Musil, by education a disciple of Mach, spoke in his authorial voice of placing precision itself under observation, "considering it as an intellectual habit and way of life, allowed to exert its exemplary influence on everything it touches." The man of precision, he explained, exists already as businessman, administrator, sportsman, and technician as well as scientist, but for the present only as an "inner man" and "only during those daytime hours they call not their life but their profession." The "logical outcome" of this "utopia of precision" he identified as a "paradoxical interplay of exactitude and indefiniteness." As Ulrich explains: "Maybe the time is coming when people will on the one hand be very intelligent, and on the other hand be mystics. Maybe our morality is already splitting into these two components. I might also say into mathematics and mysticism. Into practical improvements and unknown adventure."

Pearson may never have read Musil, but he was in some ways the man of "precision and soul" whom the novelist idealized and gently mocked. He showed throughout his youth and into maturity an appreciation of the mystical aspects of life. This mysticism inhabited for him the forms of reality that went beyond the possibility of sensory experience, and also of what determines the direction of a life, beyond the human will. But Pearson, in contrast to Ulrich and also to Goethe's Wilhelm Meister, refused to submit quietly to the destiny conveyed by events. Unlike Ulrich (and Mach), he would not abandon the "whole man confronting a whole world" for "a human something moving about in a general cultural medium," and he was less skeptical of having "firm ground underfoot and a firm skin all around." Pearson looked everywhere for wholeness and unity. Thus he could offer as the moral of his *Treasury of Human Inheritance,* a multivolume catalog of inherited deformities, "that the human being is to be treated as a whole; there is not one inheritance of disease, another of anthropometric characters and a third of psychical qualities. You cannot divide the human subject up."[4] For Pearson, as for Ulrich, precision and mysticism were not opposites, but ran together. Pearson, however, was desperate to save the self.

Udny Yule wondered if Pearson's abandonment of literature and history for the monomania of statistics so unbalanced his personality as to account for his missionary fanaticism of middle age. This is unsatisfying, both because there is abundant evidence of harsh polemical tendencies from his youth, and because he never really forsook his humanistic interests. Somehow a belief in literature coexisted with his red-hot statistical fervor under

[4] Ross, *Origins of American Social Science,* 431–432; Bannister, *Sociology and Scientism;* Musil, *The Man without Qualities,* 266, 837, 234, 312; Karl Pearson, ed., *Treasury of Human Inheritance,* vol. 1 (London: Dulau, 1912), preface, dated 14 Jan. 1912, iv.

the philosophical rubric of effective summaries of experience. He justified fiction as an alternative form of economical description that encompassed emotion, morality, and human conflict as well as natural facts. He struggled always to hold the extremes together, be it literature and science or passion and reason, so as to maintain a sense of the larger frame within which he moved. Such breadth of vision was a mark of the whole man, the cultured individual, and he bemoaned the poverty of science walled off into narrow specialties, conceived without reference to larger purposes or historical development. Scientists in this professionalized mold, scientists by occupation rather than by inspiration, could not comprehend the richness of conception and the intellectual grasp entailed in building a new field such as statistics. Knowing nothing of history, they did not understand how the work of a scientist was formed against the background of his time and place. Neither could they appreciate the formidable obstacles to really original research and the greatness required to overcome them.

Mere fame meant little to Pearson, and he turned down most of the honors offered to him as decoration for a career that, by 1905 or 1910, was destined to succeed. He wanted to be remembered, but this would count for nothing if he was reduced to a name. He despised the minimalist caricature retailed by textbook authors who make a living from science by reproducing and sucking the life from once-creative ideas, usually without concern for their original context and hence with no possibility of proper attribution.[5]

The Absence of Autobiography

Such a person as this might have been expected to write an autobiography. Yet despite, or perhaps on account of, being so concerned with his self-development and with the relation of his work to the life he led, he did not. Overlaying what he had self-mockingly called his egoism was a faith in the collective character of science. Musil explained that the man of precision, "given to taking everything seriously and without bias, is biased to the point of abhorrence against taking himself seriously, and there is, alas, no doubt that he would regard the utopia of himself as an immoral experiment on persons engaged in serious business."[6] Pearson, who took himself very seriously, worried about this self-obsession. Since it took him three quarto volumes, the last a double one, to contain Galton's life, it would indeed have been a distraction, if not an immoral experiment, to write his own.

[5] Yule, "Karl Pearson," 101; Pearson, *History of Statistics,* 185.

[6] Pearson, *History of Statistics,* 266.

Shaw supposed that Pearson was terrified of revealing himself, especially of displaying his weaknesses: "You are absolutely the damndest fool I know—a deliberately self-damned fool. Your aim is never to give yourself away, never to make a fool of yourself, to efface all vestiges of the occasions on which you have violated this rule, and never to expose yourself to the same danger again. Further, you take it on yourself to urge this line of conduct on all young pilgrims, so that if Bunyan were alive now he would cancel Mr. Worldly Wiseman & the Flatterer and all other tempters, and substitute only Karl Pearson."[7] Shaw, writing in 1893, had in mind the anonymity of the passion play Pearson had just sent him and his refusal to join forces with the Fabian Society. He replied to these charges, quite reasonably, that exhibitionism must have its limits, and that his irreverent publications on history, women, and scientific method were scarcely the work of a shrinking violet.[8] He was far from retiring, yet he was indeed full of ambivalence about self-revelation and self-advertisement.

One early outcome of this tension was his *New Werther,* let out, as I have noted, behind the transparent disguise of willful exaggeration under the pseudonym of Loki. The passion play, a work of utter sincerity, contained much of himself in the person of Jesus, and if he did not quite think of it as autobiography, he certainly did exploit the medieval genre to cast light on the deep moral choices facing an earnest person in his own time. Thereafter, his repressed autobiographical inclinations assumed diverse forms. At the end of his life he composed two brief reflective comments, one on the altogether appropriate occasion of his retirement dinner, the other inspired by a discussion of Tripos reform and the arguable defects of the system that had prevailed in his youth. Just a few years earlier, in 1930, he completed the third and final volume of his Galton biography, covering the years when he and Galton often discussed their shared concerns with statistics and eugenics. Pearson printed extensive excerpts from both sides of their correspondence, including much material about his own family background and experiences of childhood and youth, letters that shed light on Galton's biographer but not on his biography.[9] In the 1920s, Pearson gave excellent, deeply researched lectures on the history of statistics, organized biographically and written out in full. While these contain only a little about his own life and accomplishments, there is much about the relation of scientific careers to the times in which they were lived, and

[7] Shaw to KP, 20 June 1893, Pearson Papers 793.

[8] KP to Shaw, 24 June 1893, Shaw Papers, British Library, 50513 f 22. This particular exchange began with a detailed and seemingly critical letter on 20 June from Pearson about Shaw's play *The Philanderer,* a letter I have not found. Stanley Weintraub, *Bernard Shaw: The Diaries, 1885–1917,* vol. 2, 947.

[9] On this point, and indeed with specific reference to Pearson and Galton, I can recommend a novel by A. S. Byatt, *The Biographer's Tale.*

of mathematical production to the broader shape of a life. In the same years, he often talked about himself in his speeches for the Galton and biometric dinners, and again he left behind full texts.

During the Great War he started a diary, ostensibly for the benefit of his successor someday soon, but with all the features of an *apologia pro vita sua*. It is a bilious text, written in a period of particular frustration and often, as the document explains, during moments when he was laid up with lumbago. The diary consists largely of complaints about college and university administrators, irresolute donors, unsupportive Galton Laboratory board members, medical and Mendelian antagonists, misguided American contributors to *Biometrika*, and insufficiently dedicated female laboratory assistants, all documented whenever possible by letters pasted onto the pages. In a typical episode, an uninvited visitor with whom he had once crossed swords ignores his oft-expressed doubts that intellectual powers could possibly be Mendelian and wonders aloud whether "music in the Welshman was a 'Mendelian recessive.'" This recalls to Pearson's mind an earlier incident, which he commits to the diary: "I said to one of the Mendelians, I forget which, that there was a curious law of heredity worthy of Mendelian investigation as a problem in dominance. He asked which, and I replied The statement that it takes three generations to make a gentleman, but I don't think he saw the point of it." What was the point? The Mendelian in question, whose ancestry we might otherwise suppose Pearson to have slyly insulted, is in no way identified. Possibly the anecdote signified that Pearson himself, offspring of a self-made man, was a more dangerous animal than your average effete socialite, and let those who would cross him do so at their own peril. It was a most uncourtly soldier who composed these memoirs.[10]

There are other documents of a broadly autobiographical character. He published in *Biometrika* some papers on the history of statistics in his own time, often with himself on center stage, and made the journal itself a deeply personal expression, even if the language was generally abstract and mathematical. He told Galton already in 1900, apropos of its unexpected spelling: "the 'k' was mine (K.P. not C.P.)."[11] He was always present in the obituaries he wrote for colleagues and workers. The *Treasury of Human Inheritance,* with its material on the Yorkshire Pearsons, had a hint of an autobiographical dimension, and there is much more of this in the genealogies he assembled. He came increasingly to regard the self, his own in particular, as formed still more by hereditary influences than by personal

[10] "Journal of the Galton Laboratory. Confidential. 1915–1918," Pearson Papers 246, quote on 38.

[11] Pearson, *Life of Galton,* vol. 3A, 241, quoting letter of 13 Dec. 1900 (also Galton Papers 293/D).

experience. Finally, we have his letters, especially those written to Maria Sharpe after he proposed marriage to her. A man less keen to preserve what he could of the traces of his past would not have left so much behind, and one who was self-consciously sculpting his own titanic reputation, a Sigmund Freud, would have swum back across the Rubicon to burn letters like these. Pearson may have been careless, or even have deliberately destroyed some records, during his youth. On occasion he discarded letters that upset him, or that appeared without interest, and there were certainly times when he wanted letters burned so that friends or family members would not be hurt by what they contained.[12] Still, the whole Pearson *Nachlass* is in a way an invitation to examine and assess this life, with remarkably little left out, and it includes much personal commentary by K.P. himself.

Pearson believed in biography. For all his disparagement of egoism and praise of renunciation—all his socialistic, later statistical, insistence that the individual is nothing, the population everything—he wanted to represent life as something that could be lived whole. There is one obvious instance in which he expressed himself otherwise: his Machian parable (from the *Grammar*) of the blackboard that is gradually refashioned into an enameled table, a process of change that reduces identity to a fiction. In the context of his other comments on the problem, it must be read as an expression of anxiety and not only as an attack on individualism. Of the "apparent want of unity" in the contents of his collection *The Chances of Death,* he explained that "this heterogeneity will be found more in the titles of the several essays than in their contents. There must always be a unity . . . when a mind with its opinions and methods of investigation reasonably matured approaches even very diverse problems." Indeed, the signal characteristic of this mind was everywhere to find unity, "to see all phenomena, physical and social, as a connected growth." In his historical essays, some written as much as fifteen years earlier, his fundamental conclusion was "that mediaeval or western Christianity was a product neither of Jewish nor Greek minds, but of the Teutonic folk-spirit." It illustrated an indispensable axiom of comparative religion, "that neither the propounder nor the dogma, but the convert, makes a religion what it is."[13]

Indeed, Pearson's sense of life as bildungsroman, which allowed for and even required personal development as continual change, applied also to races and civilizations. He preferred the study of Teutonic to that of Greek

[12] KP to Galton, 17 Feb. 1907, Galton Papers 293/H, and Galton to KP, 18 Feb. 1907, 245/18H, involving some undefined but embarrassing relationship of Weldon to Eva Biggs, a spiritualist.

[13] "The Spirit of Biometrika," *Biometrika,* 1 (1901–2), 3–5; Pearson, *Chances of Death* (1897), preface, vi, ix.

culture because he believed the Germans and Scandinavians were effectively the ancestors of the English nation, and surely of the Yorkshire Pearsons. This harmony of racial and personal history reveals how his eugenic faith gave expression to his sense of personal identity. From childhood he had disliked the utilitarian psychology and philosophy of John Stuart Mill, whose personal crisis grew out of the associationist theory of the mind as passive, casting doubt on any idea of a core self. It is not so much the environment that makes the mind, Pearson argued, as the mind that seeks and creates a favorable environment. He came more and more to regard his own achievements in eugenic terms, as an expression of the hereditary traits of those stubborn Quaker ancestors whose colossal strength of character had enabled them to survive in a hostile world. Not least among the attractions of eugenics was that it gave assurance of a stable self, anchored in the past, which would not flutter and blow away in the winds of circumstance.[14]

In his assessments of others, also, he was inclined to presuppose some essential unity to what might appear disparate. In reply to a critic in 1895 who doubted that Arthur Balfour's natural theology had much to do with his activity as a conservative leader, Pearson denied that we can "separate Mr. Balfour the reactionary theologian from Mr. Balfour the reactionary politician. It is against this principle of dividing a man into compartments that I wish strongly to protest." Of Condorcet, Pearson observed that it would be impossible to understand his political action without reading his mathematical works.[15] In classic mathematical papers, he found peculiarities of manner and temperament, implying the possibility of outstanding personal distinction, everywhere. This view underlay his contempt for textbooks, which flattened the style and left the discoverers out. His discrimination extended even to computation, to books of numerical tables, which he refused to regard as interchangeable. When Major Greenwood spoke injudiciously of the advantage of cheap and convenient tables, Pearson exploded. Let him, if he knew no better, take his squares and cubes from Barlow:

> My admiration goes to Guldinus, who computed the first table of this kind & did to the same extent; did it by brute force. . . . I am sensitive on the history of science & simply shudder when you write why worry about Degen when there is Rolbein for 2/6! Why worry about Briggs, or Vega or even Napier when there is Chambers for 5/. ? Why worry about Galton or Darwin when you can have J. Arthur Thompson in monthly parts? Why worry about any of the *opera magna* of science, when you can find their boilings down in a dozen textbooks.

[14] Pearson, *Life of Galton,* vol 1, 112, 210; Pearson in *Speeches Delivered at a Dinner;* Pearson, "The Ancestry of Sir Francis Galton," *The Times,* 7 Feb. 1912, 5f.

[15] Pearson, "The Double-Headed Mr. Balfour," letter to the editor of the *Daily Chronicle,* 7 Oct. 1895; Pearson, *History of Statistics,* 472.

> For me the books I have mentioned stand as landmarks of computing science, and I believe they will one day for you, if you are ever driven to heavy computing work.[16]

Even nature he described as teeming with individuality, and not only in biology. To the astronomer, "it is hardly too much to say that every star he has studied has its own physical and chemical individuality." Beneath the sameness of the statistics, there is, perhaps always, "an infinity of bodies" characterized by "individuality and change." Pearson's puzzling insistence on the variability of molecules appears in the third edition of *The Grammar of Science* as a defense of their uniqueness. "Experience gives a certain sameness and a certain variation, both are really statistical results," and beyond the numbers nothing may be fully identical with anything else. "The absolute sameness of the molecule is only a statistical sameness, and . . . an ultimate individuality, a variation within the class, may be hypothecated as a means of describing new developments which may hereafter be observed when the powers of discrimination are finer."[17]

The Form of a Life

Pearson tried out various authorial styles in his sincere as well as his explicitly fictionalized autobiographical accounts. *The New Werther* took Goethe and Carlyle as inspirations. His passion play was steeped in Hamerling, and Ibsen as well as Rousseau can be discerned in the tortured, well-meaning, aggressively confessional ruminations he sent to Maria in the summer of 1889. The sour and solipsistic wartime diary recalls Meredith's egoists and some protagonists from Knut Hamsun's early novels. Only in the tales of the 1920s and 1930s does Pearson appear in his own reminiscences without literary complications as a scientific or religious saint, bearing the torch of truth and triumphing over adversity.

What forms are available to the historian to sketch out the shape of a career, including its sources and implications? Modern historical writing has been disturbingly insensitive to prose style, excellence being most often associated with the smooth flow of journalism. We historians do attend now to the question of voice, of letting the silent speak and avoiding the impersonal guise of authorial omniscience. But history is about tone, flow, and feeling as well as information and argument. History is also a form of literature, even if it aspires properly to accuracy and balance. There is no call for aggressive displays of literary virtuosity, the historical text as

[16] KP to Major Greenwood, 7 Jan. 1922, Pearson Papers 915.
[17] Pearson, *Grammar of Science,* 3d ed. (1911), 155–156.

self-referential art. I would rather aspire to an adaptation of means to ends, a style that conforms to its matter, and that opens up unexpected aspects of a topic or a historical period. In writing of serious and ponderous yet heavily ritualized activities such as science, diplomacy, law, scholarship, education, and management, I prefer at all costs to avoid imitating the prose of the natives. The noble task of historians of these things is to gently subvert it.

Science itself follows definite principles of style—principles, indeed, that form an important element in its cultural identity. Pearson, a prickly nonconformist in most of his activities, inadvertently helped to mold that style with his statistical methods. The scientific paper in its standard form minimizes narrative, drawing attention away from the actual experience of the work and the idiosyncrasies of the object under investigation to provide an idealized view of an experiment or model after the bugs have been worked out. It focuses overwhelmingly on principles or laws, the abstract claims of science, in preference to concrete objects and events in the world, and the person of the scientist remains largely out of the picture, even if the first person singular and the active voice are once again permitted in scientific prose. This first person, after all, is rarely allowed a more dynamic verb than to set up, observe, or measure. We would be surprised to find it pondering, stewing, searching, yearning, arguing, or exulting. We never see it on vacation, in bed, reading, with children, or even at a committee meeting. We would search the journals and textbooks in vain to learn how scientific life is made satisfying or frustrating; how it interpenetrates, or not, with the everyday, the practical, and the human; how it makes *meaning*.[18] Often with the aid of statistics, science simply reaches conclusions, within certain margins of error, or at a specified level of significance. We are dealing here with the preeminent tool of modern scientific impersonality. Where can we find the delicacy of style to deal with that?

It would be self-denying indeed not to exploit humor. This exalted bureaucrato-scientific aspiration to selfless impersonality is an impossible ideal. In what would seem on the surface the dullest meetings of technical specialists, the contradictions of perfect standardization in a world that remains mercifully heterogeneous play the part of the fool in a play, or the unwanted relative in a farce. Repressed or exiled, they reappear again and again in a new guise, always demanding attention and always finding advocates. The accounting standards board debates how "good will" should be depreciated by a public corporation after being assigned to a Caribbean subsidiary, while company executives motor around the offshore entity in a luxury yacht acquired and outfitted at great expense with the proceeds of this spurious sale. A vastly expanded water project, involving (let us

[18] I refrain from continuing here with questions of undoubted importance about economic, political, commercial, and military aspects of science.

suppose) port facilities for corporate pleasure boats, is recommended by House political staff to create new "benefits" and ease approval for a flood-control project—demanded by suddenly soggy cotton growers—that has been turned down by public engineers for its inadequate ratio of benefits to costs. American medical researchers have their laboratory notebooks subpoenaed so that the Congress, that bastion of objectivity, can determine if they have followed the rules of scientific method as articulated in textbooks and public lectures. Definitions of Latin American or Asian ethnicities propounded by a well-meaning census bureau and linked to the management of diversity are broken apart through the political mobilization of the populations classified. Humor here is not simply a sugar coating for prose about an inherently dull subject, but a way of bringing to light what faceless authors try so hard to ignore or suppress—the spontaneous processes, admirable or not, that subvert our modern drive for rationalization and reveal its contradictions.

In a story such as the career of Karl Pearson, emphasizing private relationships and utopian ambitions as well as scientific and historical writings, jokes are a bit too easy. They have a place, and indeed are irrepressible, but I have not wanted to ridicule the more personal aspect of this life of scientific method and statistics. The choice to focus on a single life at all might seem to turn attention away from the collective cultural, intellectual, and material processes to which history should call attention, and this project has found skeptics even among colleagues whom I particularly like and admire. Incorrigibly, I continue to believe the work is justified by the extraordinary interest of Pearson's diverse activities. My deeper ambition, however, is to raise a larger question: What has become of the liberal ideal of personal development in an age of professionalized science and scholarship?

Modern humanists, if this somewhat archaic job description may be preserved, have perhaps rejoiced too much over the "death of the subject." Against the forces of disintegration, within and without, individuals try to infuse their lives with meaning and continuity. The models for doing so are historically specific, though for those who know history, as Pearson did, they draw from many ages. His conscious struggle to preserve and assert his own distinctive self across a wide range of activities might be understood as a symphonic creation. It did not, like Bolero, reiterate the same statement with ever wilder abandon, but developed certain themes, perhaps after the fashion of the Symphonie Fantastique. A motive or idée fixe, in several related versions, is central to the work. As it surfaces with more or less clarity in the context of disparate musical developments, we realize to what extent each movement in turn has been structured by it.

I have emphasized three related polarities that run through Pearson's personal and scientific life. One is the opposition between surface or sham and authenticity or depth. On many occasions, in relation to objects as

diverse as buildings, persons, and cultures, Pearson condemned superficiality and false appearances. These were the defects of a capitalist order based on greed which yet pretended to the beliefs and morals of Christianity, a form of hypocrisy for which so many Victorian critics indicted their own society.[19] Yet Pearson frequently doubted the possibility of getting beneath appearances and celebrated the merely descriptive language that gave up vain metaphysics. This point leads to a second fundamental polarity—between connectedness and detachment. As in love, so in science, he longed for intimacy with the beauty of feminized nature. At certain ecstatic moments, especially in youth and early adulthood, he felt that he had achieved something like this, but it could not last. For a few years beginning in 1888 he imagined that conceptual or perceptual experience of ether squirts might give him access to a higher dimension of reality, and still later he looked to eugenics for a connection to the deep purposes of the cosmos. In more sober moments, however, these desires seemed irreconcilable with the stern demands of science, for precision rather than mystical union. This alienation from nature and from God signified, in Pearson's idiom of radical philosophical idealism, also an alienation from self. He offered images of disembodied confinement, as in the telephone exchange, to which he was resigned by the early 1890s as destiny. Accordingly, he spoke of the need for renunciation, elevating it as one of the highest ideals of humanity. It was also the basic moral principle of science, which thereafter should prefer accurate description and prediction over any pretense to deep truth. Or could geometrical description itself be the deeper truth, proving the utter dependence of world on mind that he was forever seeking?

The third in this trinity of polarities is between egoism and the disappearance of self. Pearson cultivated many versions of self-denial, from the dissolving of self into nature to the selfless love of Spinoza's pantheistic God who offered no love in return, from an enveloping cultural history to a moralized Marxian socialism. Statistics reaffirmed for him the lesson of cultural history, that the individual is merely the infinitesimal part of a collective reality. He demanded in private that the woman he loved maintain an independent career so as to protect him from his undoubted egoistic tendencies and, in speeches and publications, exalted scientific method as a check on personal prejudice and self-interest. His discovery of statistics, his own decisive contribution to scientific method, completed and negated this great project as he, Karl Pearson, became the voice of impersonal objectivity. As he preached self-denial, he became increasingly passionate about the destruction of individuality, which he now dreaded. Science should not annihilate the self but raise it up to higher social standard. The

[19] Houghton, *Victorian Frame of Mind,* chap. 14.

right way could not be achieved mechanically, merely by calculation, but required the wisdom and discernment of the cultivated scientific person.

These polarities, or tensions, were not his alone. I offer Pearson's life as a microhistory, a local story, involving a person much too odd to be called "representative" of his age, place, or field of activities, yet one who provides startling insights into historical transformations in the large. It was his deeply ironical fate to contribute, through his language of scientific method and his creation of new statistical tools, to a more standardized form of scientific practice. For he was radically opposed to routine, a consistent advocate of enthusiasm and creativity. Perhaps he deserved what became of him, since he was very far from being an uncompromised advocate of human freedom. In the course of a life full of contradictions, the tireless champion of method and calculation was snared in his own web. Most scholars who have examined the personal and political aspects of Pearson's life have regarded him as a malign figure. For me, he is more nearly a tragic one, and that despite the almost incomparable success of his scientific program.

My interest in Pearson has, of course, a personal dimension, too. In my dissertation research, more than two decades ago, I was put off by the arrogance of his books and articles on scientific method, the function of science, and eugenics, even as I was startled by his range and competence. The highhandedness and complacency of these writings remain as unattractive as before, and for me, after spending years working to comprehend his intellectual and emotional life, more disturbing than ever. In *Trust in Numbers* I wrote of Pearson as an exemplary and influential advocate of science in opposition to the merely personal, emphasizing his doctrine of scientific method as a strategy for standardizing the self. This argument was not altogether wrong, and his *Grammar of Science* was often read that way in his own time, but it missed a crucial nuance. Method for Pearson was not mechanical, to be followed as a routine, but a call to the higher morality of the scientific spirit, to a self-overcoming that demanded a strong self and not a weak one. In treating Pearson as I did I may have encouraged a misreading of *Trust in Numbers* as the story of an iron cage whose destiny it is to close, of the inevitable tendencies of faceless bureaucracy and objectivizing science. I did not, however, represent the quantitative mentality as a conquering army in the tragic saga of impersonality triumphant, but as an aspect of the mutual shaping of science, bureaucracy, and the larger culture. From this standpoint, the outcome of advancing quantification may be subtly different from what many thoughtful scientists wanted. For Pearson, despite his unflagging faith in the fundamental validity of statistical methods, there was something distressing about where science seemed to be headed.

It may seem that this ambivalence is mine as much as Pearson's. I would

not disagree. I was drawn to Pearson—and managed to maintain my enthusiasm through eight years of research—because of the unwonted richness, the disaffection, uncertainty, and ambivalence that I continued to discover. My interest began with his *New Werther,* which I had occasion to seek out in 1994, just as I was finishing *Trust in Numbers.* The sense of personal and religious crisis expressed in that juvenile production, with all its ambition, frustration, and passionate longing, resonated for me despite the conspicuously overwrought pathos. It also suggested promising connections between the personal and the scientific. His vast correspondence, which I began to read systematically at University College, London, confirmed and enriched my sense of interwoven threads of the personal, literary, historical, and scientific.

Did ever a Renaissance magus inhabit a world denser with meaning than that of Karl Pearson? He was torn between mathematical science and history, as I had once been, and he tried against all odds to hold out against the crushing demand for specialization without being reduced to a dilettantish gadfly. After his choice was seemingly made in 1884 for applied mathematics, his intellectual career continued to range over an immense territory, and this did not quite cease even in 1892, when he found his mission in statistics. I have been fascinated also by the personal dimension, this intense, passionate, generous, yet self-obsessed man with a strong confessional urge, an obstreperous individual and habitual loner who was lost without friendship, who sexualized nature and intellectualized sex, who drew on every resource available in an effort to know himself, who took his belief in ideals to an impossible extreme. His career went off in every direction yet was far from merely disjointed, providing me the license to explore a world that defied all specialties, and to try to comprehend, following my subject, what sense was to be made of it.

Pearson's life, as lived, was very far from the objective rules of scientific method. He was, as should by now be clear, an inveterate producer of fictions. He was forever telling and embellishing his own story, not only for friends but for posterity, as if one purpose of his life was to supply a character for a novel or a history. Unlike the peasant participants in passion plays whose simplicity so charmed him, and for whom God and an umbrella were equally real, he could not believe in the supernatural, and he insisted on the moral duty to distinguish fiction from reality. Yet the pattern of his life was a mosaic of experience and imagination, which a faithful history should somehow capture, and in my writing I have tried to envelop the infinitesimal moment of an event within those reconstructions in memory and embellishments in fiction that make it part of the record of a life. Raphael Wertheimer, Oscar Browning, Maria Sharpe, and even Francis Galton were imaginary as well as real characters, and the moments of confrontation between their physical persons and Pearson's imaginative

representation could be disturbing to other friends and correspondents, and to themselves.

Pearson also was imaginative in reconstructing himself. He shaped his life partly in reference to the fictions of Goethe, who wrote of life as a process of growth and self-realization, and of Hamerling, who justified sensuality as a source of artistic expression. In his betrothal drama, Pearson followed or consciously avoided scripts from Ibsen dramas, which were also known to Maria. To face the public he required always a disguise, so that in his published writings that inner self he once identified as feminine was usually concealed behind a mask of self-confident rationality. Over the years, this persona became more and more real as its vulnerable counterpart was allowed to atrophy. Hence his reminiscences as an old man display almost nothing of the uncertainty, the confusion, and the self-doubting so copiously illustrated in his early letters and anonymous fictional writings. As the author of his own life, Pearson created a character of relentless rationality, the very solution he offered as remedy for the world's ills. Even this did not mean rejecting literature, whose purpose he now construed as the economical summary of experience. Pearson explained fiction as the representation of human patterns of feeling and behavior, nature as following laws of mind, and science as utterly dependent on imagination. This great champion of statistics, then, managed very nearly to merge science and literature in a life devoted to fact and suffused by fiction.

He lived equally in a dialogue with the past, situating his own society within the long-term historical development of Germanic culture. Some specific turning points, especially the German Reformation, had a definite contemporary meaning for him, representing the danger of unreason unhinged. Scientific rationality he understood not just as epistemology, but historically and socially, as the foundation of a new age. He was keenly interested in the larger tendencies of history, which he made it his business to comprehend and from which he then drew meaning and morals. Historical figures, as much as literary ones, were part of his world of reference, and he compared himself and his contemporaries to them. He held steadfastly to a faith, very nearly religious, in progress, perhaps all the more so because of his tendency to pessimism, and it was important for him to understand the direction of history in his own time so he could align himself with it. He was loyal to the end to a historical sensibility that would recover the conditions of life and thought within which scientists and other creative individuals worked. They had a place in his imagination, which I have tried to express.

Science, for Pearson, reflected the values of the collective; it was itself socialism, since it defined a mode of thought and investigation that canceled out the private self. The individual had at best uncertain status in the

social and cultural form of history he preferred, and still less significance in statistics. Yet the ideal of individual development was among his enduring commitments, one he applied most implacably to himself. Intensely ambitious, he wanted deeply to make his mark on the world, and he came to believe that he had through a program of statistics that he saw as principally the outcome of his own efforts, though he pretended sometimes to credit everything to Galton or Weldon. Science might be universal, but he was determined to put his stamp on it, and even to see the distinctive signs of his own personality in scientific works as unpromising as compilations of measurements and computations. As with Condorcet, whose mathematical abilities Pearson thought unimpressive, he wanted his own mathematical writing to reveal "the presence of a strong and unique personality; here in the somewhat arid desert of symbols, is an oasis with its spring of refreshing ideas for the parched and weary traveler." He had no truck with the idea that real science might ever be routine or automatic. Instead, it should become forever richer, placing ever greater demands on the skill and inspiration of the scientist. In some remarks on Newton, for example, we find: "Like every simplification of scientific notions the law of gravitation while simplifying our philosophy of the universe, made the study of it—which hardly existed before—infinitely more complicated."[20]

Pearson's analysis of scientific method in *The Grammar of Science,* and his relentless advocacy of statistics throughout the sciences, were an inspiration to reformers, engineers, and social and natural scientists who saw his work as the key to an escape from history, the negation of individual peculiarities, the standardization of reasoning, and the triumph of pure fact over the subtleties of literary invention. They had plausible grounds for believing so. But the founder of modern statistics was a very complicated man, who on various occasions refused almost all of his own simplifications, and who yearned to reshape the sciences and their interactions with the world in a way quite different from what his field was made to stand for.

Karl Pearson: A Tragedy?

Shaw thought Pearson's life a tragedy because of his insistence on "enthusiasm of the study" over that of the "marketplace" and his habit of working and acting independently. Pearson practiced detachment also in his positivistic distancing from nature, that object of intense youthful longing. "But what are we going to do with the things that won't let us understand them? [Musil's character] Fishel asked prophetically. We measure them,

[20] Pearson, *History of Statistics,* 489, 649.

we weigh them, we analyze them mentally."[21] Pearson himself did not believe that this distancing proceeded from any remoteness or lack of warmth on his part. He identified with a characterization of Condorcet, his predecessor in social quantification, which he repeated several times in his lectures. Condorcet was a volcano, the heat of passion boiling in his heart, though his exterior was draped in ice. Pearson arranged to have read at his funeral, in 1936, some lines from "A Grammarian's Funeral" by Robert Browning. "This man decided not to Live but Know." In death he hoped to pass "to the place where either no problems exist, or their solutions are clear as day."[22]

Although Pearson's name is known to almost everyone who works with statistics, his desire that it might be associated with a distinctive style and vision went nowhere. So personal an institution as his collection of laboratories could scarcely survive his retirement intact. Raymond Pearl anticipated the worst "if the university should appoint that lousy scoundrel R. A. Fisher . . . to succeed you." Fisher was, in fact, named to the Galton chair and was installed in Pearson's office, from which he removed the tasteful backdrop of skulls and took down many of the pictures of eminent statisticians and inspirational mottos posted on the walls. "His chief aim seems to be to cast scorn on his predecessor and all who use any of his methods," complained this disgruntled predecessor.[23] Indeed, Fisher persuaded many statisticians of the next generation of Pearson's indifferent mathematical competence. They came to believe, with some reason, that he had put himself in the way of further progress in his field. Subsequently, as is the fate of most scientists, he was reduced to a name, which many no longer know to distinguish from that of his son, Egon. In the building now named for him at University College London, nobody knows who this Karl Pearson was.

How could he be remembered for his wide-ranging intellectual ambition, his odd and untimely program for the future, and his very personal style in a field of endeavor—exact science—that puts little value on any of these and has scarcely any capacity to hold on to memories beyond a single generation? If, as the institutions and practices of scientific recollection generally presuppose, the history of science is not much more than a

[21] Musil, *Man without Qualities,* 1678.

[22] Pearson, *History of Statistics,* e.g., 450, 505; E. S. Pearson, *Karl Pearson,* 125. The last line is from his remarks on the passing of his coworker H. E. Soper, in Pearson, *Tables for Statisticians,* Part II (1931), vi. He chose to be cremated, his body released by fire from the prison of the tomb. He called it "the more fitting end for what must one day perish. It is with pain that I think even today of Francis Galton's mortal remains confined in a vault." Pearson, *Life of Galton,* vol. 3 (1930), 435n.

[23] Pearl to KP, 31 Dec. 1932, Pearson Papers 782; KP to Pearl, 30 Aug. 1935, Pearl Papers.

progress of technical knowledge, the people and the cultures that make and nurture it are really of very little significance. Pearson, who believed quite otherwise, nevertheless helped to create this more standardized world of seemingly interchangeable science. This is what his beloved "scientific method" has come to stand for, a form of intellectual practice that he inadvertently encouraged and that he sought to challenge with a life whose keynote would be intellectual love.

Pearson insisted on the integrity and coherence of his career and vision, but it is difficult to examine that life from the standpoint of the present without finding a deep tension. He appears as the disciplinary founder of a program of calculation that defines and symbolizes for us the mechanical aspects of scientific reason, the utter impersonality of science. Yet there is another Pearson who rejected routines, condemned the distortion of self implied by excessive specialization, and tried to redeem his own individuality along with that of every scientist. One Pearson stands for technical solutions to precisely stated problems, the other for generality and wisdom. I am far from believing that Pearson's own words and deeds were consistently wise. The question, however, loses none of its poignancy: Which of these ideals constitutes his legacy? We can scarcely doubt that his career has come to stand for the more routine, mechanical, and bureaucratic vision of science. And in this sense, we really do live now in a scientific age, one that depends utterly on the technical methods and achievements of science. But if we wonder why the knowledge of science seems to have so little influence on larger decisions and public attitudes, this legacy may give us a part of the answer. Call it Pearson's choice, though he tried to opt for the other one.

Bibliography

There are two indispensable works of reference for anyone who cares to undertake work on Pearson. G. M. Morant, *A Bibliography of the Statistical and Other Writings of Karl Pearson* (London: *Biometrika* Office, 1939), provides a very nearly complete list of Pearson's writings apart from letters to newspapers, including summaries of some of his more important books and articles. M. Merrington, B. Blundell, S. Burrough, J. Golden, and J. Hogarth, *A List of the Papers and Correspondence of Karl Pearson (1857–1936) Held in the Manuscripts Room, University College London Library* (London: University College, 1983), is a guide to the archive.

The bibliography to follow does not provide anything like a complete list of primary sources used in this study but is really only a guide to the footnotes. I list the Pearson correspondents who are most important for this study, then a few of his papers and books, and finally I list my main secondary sources.

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