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Introduction

In *Some Thoughts Concerning Education*, John Locke made an uncharacteristic but striking observation:

> God has stampt certain Characters upon Men's Minds, which, like their shapes, may perhaps be a little mended; but can hardly be totally alter'd, and transformed into the contrary.
>
> He therefore, that is about Children, should well study their Natures and Aptitudes, and see by often Tryals, what turn they easily take, and what becomes of them; observe what their Native Stock is, how it may be improved, and what it is fit for ... Everyone's Natural Genius should be carried as far as it could, but to attempt the putting another upon him, will be but Labour in vain.[1]

This study deals with a group of late nineteenth and twentieth century psychologists who spent their lives carrying out Locke's injunctions. They agreed that children differed in their innate capacities; tried to develop a scientific understanding of their 'natures and aptitudes'; devised 'Tryals' intended to see 'what turn they easily take'; and insisted that education should be based on each individual's 'Natural Genius'.

The argument focuses on three main themes: the emergence of the profession of educational psychology; the history of ideas about children's mental development, in particular the development of the subnormal and the gifted; and the role of psychological experts in formulating educational policy. It tries to relate the history of psychology to the history of the meritocratic ideal – the idea that educational opportunity should be determined by natural ability rather than personal contacts – suggesting that both the rise and the decline of mental measurement were bound up with the political career of this concept. It argues that the years after 1880 saw a revolution in our understanding of child development. In 1880, experts estimated children's intelligences by measuring the size of their skulls and insisted that their mental development recapitulated the development of the race; by 1950 educational psychologists had organised themselves into a profession and equipped themselves with most of the standard techniques of modern science.

[1] James L. Axtell (ed.), *The Educational Writings of John Locke* (Cambridge, 1968), pp. 159–60.

They developed relatively sophisticated tests for measuring intelligence, and argued about mental abilities at an impressive level of abstraction. They furnished government committees with influential information on the mental and emotional characteristics of schoolchildren, and made important contributions to such diverse areas as educational theory, child development, and statistical method.

Much of the analysis in this book concentrates on eleven key individuals: James Sully (1843–1923), Francis Warner (1847–1926), John Adams (1857–1934), W. H. Winch (1864–1955), P. B. Ballard (1865–1950), Charles Spearman (1863–1945), Thomas Percy Nunn (1870–1944), C. W. Valentine (1879–1964), Godfrey Thomson (1881–1955), Susan Isaacs (1885–1948) and, of course, Cyril Burt (1883–1971). Warner and Sully dominated the Child Study movement; Adams and Nunn introduced psychology into teacher training courses; Winch and Ballard combined their work at the London County Council with their enthusiasm for psychology; and Spearman set up the most influential research school in psychology in the country. It was Valentine, Thomson, Burt, and Isaacs, however, who were the hard-core members of the first generation of professional educational psychologists.[2] They spent their adult lives working in the subject; set up and presided over its most important institutions; attracted a number of gifted pupils into the profession; wrote a substantial body of textbooks and monographs; and did their best to sell the discipline to the educational and scientific establishments. Two non-psychologists are also given considerable prominence: Sir Francis Galton (1822–1911) and Karl Pearson (1857–1936), on the grounds that they developed a 'scientific research programme' which is at the heart of inter-war educational psychology: the analysis and measurement of individual differences. It was on the validity of this idea that the subject hung its claim to be a scientific movement as well as a guide to better teaching and classroom organisation.

These psychologists managed to command a considerable influence over English education between 1880 and 1950. They invented objective intelligence tests – later to be called IQ tests – which most Local Education Authorities eventually used to help allocate secondary-school places. The theory upon which these tests rested – that children differed from each other in their innate abilities; that these innate abilities were open to measurement by objective methods; and that they might be represented by single numbers arranged on a linear scale – was increasingly relied upon by the defenders of selective education in their arguments with their numerous critics. They were deeply involved with the movement for special education for the mentally handicapped, providing individual tests for the classification of the handicapped and helping to develop effective methods for teaching them as much as they could learn. They were also in the forefront of the

[2] For a lucid contemporary discussion of what psychologists did, and how they differed from psychiatrists and psycho-analysts, see *The Voluntary Mental Health Services. The Report of the Feversham Committee* (1939), pp. 14–15. For definitions of technical terms used in this book, see the glossary.

progressive education movement – a movement which sought to base education on the needs of the child rather than on the demands of educational tradition, and which campaigned to restrict adult authority and to introduce free-play into the classroom.

Their ideas were important for their intellectual content as well as their practical impact. The psychologists led a revolution in the relations regarded as appropriate between the child and the education offered to him. Education no longer entailed repressing the child's emotions and subjecting him to routine and drill; instead it was a natural process, with teachers doing little more than reinforce a biological development. The psychologists also reconciled two ideas which have been regarded as incompatible in recent educational literature: commitment to child-centred education and interest in the intellectual difference between children. R. H. Tawney summed up the scope and importance of this revolution in educational thinking with his customary eloquence:

> Important as have been the changes in educational practice of the last generations, the most significant development has taken place in the sphere, not of action, but of thought. It has been the emergence of an independent body of educational doctrine, with canons of its own, based not on traditional lore or social conventions, but on a study of the manner in which nature deals with the young. The characteristics and needs of different phases of their growth are known today with a precision impossible in the past. Biological and psychological realities are coming slowly to their own. Education is regarded as a process designed, not to enable children to fit into the moulds, or acquire the formulae, thought desirable by adults, but to enable them when they are children to be healthy, and, if possible, happy children, in the faith that it serves their future best, in proportion as it assists them to make the most of the present.[3]

The troubled development of educational psychology also points to three rather more general themes in recent English history: the academic community's lethargy in the face of innovation and scepticism in response to the promise of a 'science of education'; the English ambivalence about meritocratic selection and social mobility; and the intimate connections between scientific theory – particularly biological theory – and wider issues of public policy and political passions.

The second half of the nineteenth century witnessed one of the most important revolutions in English educational history: the belated introduction of compulsory state education. In the twentieth century this revolution was gradually extended, so that after 1944 every child whose health permitted it remained at school until the age of fifteen. For the first time ever schoolteachers were confronted with the entire range of the school population, drawn from different social backgrounds and endowed with varying abilities. Educational psychologists provided important advice on this unprecedented problem, designing tests to distinguish between ability and training, and helping to deal with the delinquent and the difficult. In

[3] R. H. Tawney, *Some Thoughts on the Economics of Public Education* (1931), p. 21.

particular, they provided invaluable help with the mentally subnormal. Teachers rapidly realised that a number of children were failing to profit from their education through no fault of their own: they simply lacked the intellectual ability. Psychologists distinguished between innate and environmentally induced backwardness; designed tests intended to rank children according to his innate ability; and classified the dull into several sub-groups, such as the subnormal and the backward.

The psychologists drew much of their inspiration from the burgeoning biological sciences. Whereas educational thought had once concentrated on the mechanics of teaching, it increasingly dealt with the child's natural development, turning itself from a 'mechanical to a biological art'.[4] A passion of a few eccentric scientists in the mid nineteenth century, biology established itself as a major force in the twentieth, with its own departments, journals, and professoriates. Many intellectuals were wildly optimistic about the discipline, convinced that it might help to improve the human stock, and even technical debates amongst biologists caught the public eye. Henry Adams felt that 'the fall or rise of half a dozen empires interested a student of history less than the rise of the *Grammar of Science*'[5] – a technical text by Karl Pearson, a biometrician at the University of London. For biology was rapidly becoming enmeshed with issues of politics and policy: the eugenics movement was only the most colourful of several attempts to translate the laws of natural selection into a social programme. Education is arguably the most interesting example of the influence of biological thought on social policy making.

Finally the book also tries to throw light on the rise of the meritocracy. It deals with the tendency of an advanced society to select able children for élite positions, and increasingly to equate ability with intelligence. The psychologists discussed below were obsessed with intelligence, hoping to construct an educational machine capable of training children according to their innate abilities. They believed firmly in equality of opportunity; everyone was to take an 'objective' test which would reveal their innate abilities. But they wanted opportunity to operate in a hierarchical and open-class society; and they felt that innate differences between children would ensure that more radical egalitarianism was nothing more than a fantasy. The influence of their work, together with the resistance to it and the eventual revolt against it, illuminates the highly ambivalent attitude of English society to the meritocratic ideal.

The historiography of this subject, although small until recently, has now entered a phase of rapid expansion. In general, it has been the work of historians of four very different kinds: professional psychologists; politically motivated polemicists; historians of science and medicine; and historians of education. Like the subjects of his work, the historian of educational psychology is caught between the often hostile worlds of psychology, medicine, education and politics.

[4] Graham Wallas, *Men and Ideas* (1940), p. 134.
[5] Ernest Samuels (ed.), *The Education of Henry Adams* (1918; 1973 ed.), p. 450.

Psychologists have written a good deal on the history of their discipline, most notably short biographical and autobiographical sketches, profiles of institutions, and recollections of their relations with other subjects. In particular, the first generation of professional psychologists – the group at the heart of this book – devoted a good deal of time to historical reflection. Although their work forms an invaluable body of evidence, it suffers from a number of familiar problems, sacrificing analysis to celebration, and telling us little about the social context of scientific arguments; its approach is thoroughly 'Whiggish'.[6]

Leslie Hearnshaw's biography of Burt is undoubtedly the most interesting product of this historiographical tradition. The book started out as a formal act of piety to one of psychology's founders: Hearnshaw delivered a funeral oration on Burt's achievement[7] and Burt's sister Marion commissioned him to write an official biography. But newspaper charges about Burt's professional dishonesty, which began to come out while Hearnshaw was at work, transformed his task, and forced him to produce a much more critical piece of historical research: too critical, perhaps.[8] *Measuring the Mind* includes a considerable body of material on Burt; yet it differs from Hearnshaw's work in several important ways. It deals with the public aspect of Burt's life, and says almost nothing about his private life or mental state. It sets his work firmly in the context of the intellectual tradition he belonged to – the psychology of individual differences – and is as concerned to illuminate this tradition as to examine his personal contributions to it. Above all, it deals with many issues about which Hearnshaw said little or nothing, notably the eugenics movement and the meritocratic tradition.

Predictably enough, most of the literature on educational psychology suffers from an undisguised bias against the subject. Few scientists have aroused as much hostility as have the psychometrists. Their work has played a central part in two of the most acrimonious debates in recent intellectual history: the debate about sociobiology[9] and the controversy over race and IQ.[10] An astonishing number of

[6] For biographical and autobiographical sketches, see C. Murchison (ed.), *A History of Psychology in Autobiography*, *Occupational Psychology*, esp. 22–3 (1948–9), and *Brit. J. Psych.* and *Brit. J. Educ. Psych.* for the year of death. For accounts of University Departments, see *Bull. Br. Psych. Soc.* (Nos. 9 and 10 deal with Oxford, No. 26 deals with Manchester, and No. 27 with University College, London). For histories of psychology written by psychologists, see J. C. Flugel, *A Hundred Years of Psychology* (2nd edn, 1951), and L. S. Hearnshaw, *A Short History of Psychology 1840–1940* (1964).

[7] L. S. Hearnshaw, 'Obituary: Sir Cyril Burt', *Bull. Br. Psych. Soc.* Vol. 25 (1972), p. 86. See also, 'Cyril Ludowic Burt, 1883–1971', *Proceedings of the British Academy* Vol. 48 (1972), pp. 475–92.

[8] L. S. Hearnshaw, *Cyril Burt, Psychologist* (1979). The preface (pp. vii–ix) provides an account of the writing of the biography.

[9] The contemporary literature on the 'sociobiology debate' is extensive. For papers representing various points of view on sociobiology, see A. L. Caplan (ed.), *The Sociobiology Debate* (New York, 1978); T. H. Clutton Brock and P. H. Harvey (eds.), *Readings in Sociobiology* (Cambridge, 1978). For criticisms of sociobiology, see R. C. Lewontin, *The Genetic Basis of Evolutionary Change* (New York, 1974) and R. C. Lewontin, Steven Rose and Leon J. Kamin, *Not in Our Genes* (1984).

[10] For criticisms of intelligence testing, see Brian Simon, *Intelligence Testing and the Comprehensive School* (1953) and *Education, Intelligence and Psychology* (1971); *The Politics of Educational Reform*

academics, including educationalists, biologists, sociologists and other psychologists, writing in a mind-boggling range of publications, have set out to blacken their motives and discredit their influence.

Some of the writings in this tradition are illuminating. In *The Science and Politics of IQ* (1974), Leon J. Kamin produces some spine-chilling quotations from the pioneers of American psychology. In *The Mismeasure of Man* (New York, 1981), Stephen Jay Gould suggests many important connections between craniometry and mental testing and presents some interesting interpretations of Burt's devotion to factor analysis. In *The Psychological Complex. Psychology, Politics and Society in England 1869–1939* (1985), Nikolas Rose provides some intriguing explanations of how 'psycho-eugenicists' like Burt and Spearman came to think as they did, focusing on broad intellectual movements, such as the rise of the idea that the population is a vital national resource, which governments neglect at their peril, and the spread of notions of efficiency and inefficiency. Brian Simon's work rests on formidable knowledge of English educational history. Yet too many of the works in this tradition suffer from the all-too-familiar failings of polemical history. They exaggerate the influence of psychologists on practical policy – policy-makers would have restricted immigration or supported selective education even if psychologists had reached different conclusions[11] – and ignore the intricacies of circumstance and context, mistaking consequences for intentions and sacrificing understanding to moral outrage. In other words, they tell us more about the campus politics of the 1960s and 1970s than they do about the history of psychology.

Several historians of biology have helped to reconstruct the intellectual world of psychometry. In particular, a small army of historians has reminded us of the eugenic dimension to the history of everything from family allowances to popular fiction.[12] In the first couple of decades after the Second World War, British

1920–1940 (1974), pp. 225–50; Leon J. Kamin, *The Science and Politics of IQ* (New York, 1974), and Kamin's contribution to *Intelligence: The Battle for the Mind: H. J. Eysenck versus Leon Kamin*, pp. 90–156 and pp. 172–187; N. J. Block and G. Dworkin (eds.), *The IQ Controversy* (New York, 1976); Stephen Jay Gould, *The Mismeasure of Man* (New York, 1981); B. Evans and B. Waites, *IQ and Mental Testing. An Unnatural Science and its Social History* (1981). See also Seymour B. Sarason, *Psychology Misdirected* (New York, 1981); and Samuel Bowles and Herbert Gintis, *Schooling in Capitalist America. Educational Reform and the Contradictions of Economic Life* (New York, 1976), esp. pp. 114–24. For a particularly sophisticated and persuasive statement of this case, see Clarence J. Karier, 'Testing for Order and Control in the Corporate Liberal State', reprinted in Block and Dworkin (eds.), *The IQ Controversy*, pp. 339–73.

[11] Franz Samelson, 'On the Science and Politics of the IQ', *Social Research* Vol. 42 (Autumn 1975), pp. 467–88. See also Samelson, 'Putting Psychology on the Map: Ideology and Intelligence Testing', in Allan R. Buss (ed.), *Psychology in Social Context* (New York, 1979). For a revisionist account of American psychology, see Michael M. Sokal (ed.), *Psychological Testing and American Society 1890–1930* (Rutgers, 1987). For a revisionist account of American sociobiology, see Carl N. Degler, *In Search of Human Nature. The Decline and Revival of Darwinism in American Social Thought* (1991).

[12] See, for example, Daniel Pick, *Faces of Degeneration. A European Disorder c.1848–c.1918* (Cambridge, 1989), pp. 155–75. Cf. Jonathan Harwood, 'Genetics, Eugenics and Evolution', *British Journal for the History of Science* Vol. 22, No. 74 (September 1989), p. 261.

historians all but ignored eugenics – as though it was a German invention attractive only to the most unhinged and unpatriotic Englishmen. The few books on the subject were dutiful studies by aging eugenicists.[13] But in 1969 Lyndsay Farrall pointed out, in a much-quoted PhD thesis, that eugenics was invented in England and excited the enthusiasm of generations of English intellectuals.[14] Since then the studies have poured from the printing presses.[15] In particular, Bernard Norton and Donald Mackenzie have examined the works of Galton and Pearson, traced the development of British statistics, and emphasised the connections between scientific thought and social interests.[16] More recently, Daniel Kevles has reconstructed the biographies of leading eugenicists, traced the rise of a 'reform eugenics' which criticised psychometric orthodoxy, and charted the recent revival of sociobiology.[17]

Not surprisingly, a few historians of education have found intelligence tests worthy of detailed examination. In particular, Gillian Sutherland's *Ability, Merit and Measurement* (1984)[18] examines in meticulous detail a problem which is closely connected – indeed, which often intersects with – the problem explored in this study. Yet, despite superficial resemblances, this study differs in its central preoccupations from Sutherland's book. Here we are concerned with the development of the profession of educational psychology, with changes in psychologists' understandings of children's mental development, and with the 'political' commitments of the psychologists. Sutherland's book, although it contains much invaluable information on both of these themes, is primarily concerned with the applications of the theory of mental measurement to the practice of educational selection.

[13] C. P. Blacker, *Eugenics: Galton and After* (1952) is the best of the breed.

[14] This dissertation has finally been published. See Lyndsay Farrall, *The Origins and Growth of the English Eugenics Movement 1865–1925* (New York, 1985).

[15] See, for example, G. R. Searle, *Eugenics and Politics in Britain 1900–1914* (Leyden, 1976); *Annals of Science*: Special issue on Eugenics in Britain, esp. Lyndsay Farrall, 'The History of Eugenics: A Bibliographical Review', *Annals of Science* Vol. 36 (March 1979), pp. 111–23; Lyndsay Farrall, *The Origins and Growth of the English Eugenics Movement 1865–1925* (Ann Arbor: Univ. Microfilm, 1970); Donald Mackenzie, 'Eugenics in Britain', *Social Studies of Science* Vol. 6 (1976), pp. 499–532; Pauline M. H. Mazumdar, *Eugenics, Human Genetics and Human Failings. The Eugenics Society, its Sources and its Critics in Britain* (1992); Elazar Barkan, *The Retreat of Scientific Racism. Changing Concepts of Race in Britain and the United States Between the Wars* (Cambridge, 1992).

[16] See, for example, B. J. Norton, 'Metaphysics and Population Genetics: Karl Pearson and the Background to Fisher's Multi-factorial Theory of Inheritance', *Annals of Science* Vol. 32 (1975), pp. 537–53; 'Karl Pearson and Statistics: The Social Origins of Scientific Innovation', *Social Studies of Science* Vol. 8 (1978), pp. 3–34; and 'Karl Pearson and the Galtonian Tradition: Studies in the Rise of Quantitative Social Biology', PhD thesis, University of London, 1978. D. Mackenzie, *Statistics in Britain 1865–1930. The Social Construction of Scientific Knowledge* (1981). See also Charles Webster (ed.), *Biology, Medicine and Society* (Cambridge, 1981).

[17] Daniel Kevles, *In the Name of Eugenics. Genetics and the Uses of Human Heredity* (New York, 1985). The essay on sources (pp. 383–405) is an excellent guide to the growing literature. See also Farrall, 'The History of Eugenics: A Bibliographical Review', pp. 111–23.

[18] Gillian Sutherland, *Ability, Merit and Measurement: Mental Testing and English Education* (Oxford, 1984).

The spread of competitive examination and meritocratic appointment has attracted less attention than it deserves. The best general introduction to the subject is Michael Sanderson's *Educational Opportunity and Social Change in England* (1987). John Roach's *Public Examinations in England* discusses the establishment of the competitive principle, the spread of the Oxford and Cambridge local examinations, and the rise of the civil service examinations.[19] It is particularly good on contemporary criticisms of examinations – criticisms which were to be reiterated in rather less eloquent terms by opponents of IQ testing. Keith Hope's unpublished book on *The Political Conception of Merit*[20] has been a valuable guide to this subject; in particular, it stresses the close links between Thomas Babington Macaulay, Francis Galton, and the psychometrists. Unexplored until Hope's work, these links help both to explain the origins of a number of ideas at the heart of educational psychology and to clarify the reforming intentions of the psychometrists.

The history of more recent educational history has been a boom business of late, as scholars try to explain the breakdown of the progressive consensus and the rise of the new right. How did the ideals of comprehensive education and child-centred teaching become tarnished? Why did increased investment in education fail to generate economic growth and diminish social inequality? How did the neo-conservatives seize the intellectual initiative from the Butskellite establishment? Such major issues are now being intensively researched and hotly debated. Much of this writing is polemical in tone and neo-Marxist in method: at once elegiac about the comprehensive experiment and critical of subsequent reforms.[21] Too much of the rest is new-right polemic rather than dispassionate history. But there are still some excellent books being written.[22] In *An Educational War on Poverty*, Harold and Pamela Silver have provided an authoritative account, based on exhaustive reading and enlivened by numerous interviews, of an Anglo-American bid to use educational resources to solve social ills.[23] Brian Simon has synthesised a huge range of primary material, though he interprets it from a perspective rather different from my own.[24] Writing from a rather different ideological perspective,

[19] John Roach, *Public Examinations in England* (Cambridge, 1971). Roach continues his account in 'Examinations and the Secondary Schools 1900–1945', *History of Education* Vol. 8 (1979), pp. 45–58.

[20] Keith Hope, *The Political Conception of Merit* (to be published by Russell Sage). See also *As Others See Us: A Study of Merit, Advantage and Deprivation in Scotland* (Cambridge).

[21] Clyde Chitty, *Towards a New Education System: The Victory of the Right* (Lewes, 1989); Ken Jones, *Right Turn. The Conservative Revolution in Education* (1989).

[22] Unfortunately, Britain is still not as well served as the United States with balanced general accounts of educational reform. See, for example, Thomas Toch, *In the Name of Excellence. The Struggle to Reform the Nation's Schools, Why It's Failing, and What Should Be Done* (Oxford, 1991).

[23] Harold and Pamela Silver, *An Educational War on Poverty. American and British Policy-making 1960–1980* (Cambridge, 1981).

[24] Brian Simon, *Education and the Social Order 1940–1990* (1991).

Christopher Knight has produced a meticulously researched account of origins of recent Tory educational thinking.[25]

The discussion here is confined to England and Wales for three main reasons. It is concerned with the relationship between psychological theory and educational practice – with the ways in which new ideas were taken up by policy makers and put into practice by local officials. It examines a peculiarly English aversion to the development of a new academic discipline, particularly when that discipline threatened to extend scientific methods to a realm which had previously been reserved for 'common sense'. Above all, it tries to analyse the highly ambivalent English reaction to the ideal which underpinned the work of these psychologists: 'the political conception of merit'. England's failure to commit itself wholeheartedly to industrialism and capitalism is reflected in its fears about 'social mobility' and the 'rise of the meritocracy'. Scotland is omitted because its education system was distinct from England's, and because it was much more open to both the academic study of educational psychology and the meritocratic ideal; it is consequently a useful comparative study rather than an integral part of the main discussion. But the numerous links between England and Scotland have forced a certain widening of focus. In particular, Godfrey Thomson has been lumped together with the English psychologists (despite the fact that he spent most of his working life in Edinburgh) because he was English in origin, even calling his autobiography 'The Education of an Englishman'. He profoundly influenced the leading debates within the psychometric movement; and his intelligence tests, the Moray House Tests, were more widely used than any other kinds of tests in inter-war England. Indeed, the international nature of educational psychology is one of its most interesting features. New ideas about children and education, and about the proper relationship between the two, flourished on the continent and in the United States, and were eagerly watched and rapidly absorbed in England. Paradoxically, then, the focus on a single national community illustrates the international nature of this particular scientific movement.

The analysis makes use of four historical methods: an examination of the personal and professional lives of a generation or so of psychologists; an analysis of the institutions of the Child Study movement, the British Psychological Society and other organisations which aided the growth of the discipline; a study of the impact of psychological theory on official policy making; and a reconstruction of the intellectual lives of these psychologists (and, in the process, of their critics). It is thus, at different points, an exercise in prosopography, in institutional history. The prosopographical sections rest on the numerous biographical and auto-biographical writings of these psychologists. Particular emphasis is placed on Burt's work because of the unique quality of his papers as well as his central (and controversial) role in the development of the subject. The institutional histories

[25] Christopher Knight, *The Making of Tory Education Policy in Post-War Britain 1950–1986* (Lewes, 1990).

draw on numerous well-stocked institutional archives, while the remarks on the formation of educational policy rest on the papers on the Board of Education's Consultative Committee. The intellectual history of psychology draws on a wide range of writings published throughout this period.

The narrative sets the development of psychological theory in the context of professional self-interest and social policy making. It explores the links between the pursuit of jobs and the production of ideas and between political interest and scientific arguments. It examines the psychologists' career patterns and immediate professional environments – their reasons for turning to psychology and their relations with other scientific communities – and also emphasises the influence which considerations of political policy and personal status exercised over the discipline's development; in other words, it is a history of ideas in their numerous contexts. Psychologists spent much of their time trying to satisfy an official demand for an objective classification of the child population; and they responded to snubs from members of established scientific communities by emphasising the quantitative aspects of their work.

Measuring the Mind tries to avoid the crude reductionism which sees ideas as the mere epiphenomena of 'social' and 'material' forces. Two standard positions in the historiography of science are considered and rejected. The first of these sees science as an instrument of the social interests of a monolithic group: the capitalist class or, in more sophisticated versions, the professional middle class. The second looks upon ideas as vehicles of self-interested professionals, advanced in so far as they serve their careers and rejected whenever they fail to do so. Such arguments tend to replace the 'logic of scientific discovery' popular in more traditional accounts of scientific innovation with the 'logic of social interests'. Yet, as James D. Watson has emphasised, 'science seldom proceeds in the straightforward manner imagined by outsiders. Instead, its steps forward (and sometimes backward) are often very human events in which personalities and cultural traditions play major roles.'[26] In particular, the contingent and the eccentric played an important part in the discipline's development. Indeed, the first generation of professional psychologists often found themselves teaching the subject more by accident than by design. Burt wanted to read medicine, was trapped by the conditions of his scholarship into reading classics, but found that psychology had been incorporated into the classics syllabus. Thomson obtained a PhD in physics in Germany but found that the conditions of his scholarship required him to teach in an English school or training college.

The narrative starts with an account of the Child Study movement – a late Victorian flourishing of interest in the child population which inspired numerous studies of child development and attracted some of the key inter-war psychologists into the subject. The movement was rooted in two distinct intellectual develop-

[26] James D. Watson, *The Double Helix: A Personal Account of the Discovery of DNA* (New York, 1980 edn), p. xi.