IMAGES OF HUMAN NATURE : EXPERIMENTAL PSYCHOLOGY IN VICTORIAN BRITAIN

A thesis submitted to the University of Manchester for the degree of Doctor of Philosophy in the Faculty of Science

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April, 1984

DECLARATION

No portion of the work in this dissertation has been submitted in support of an application for another degree or qualification at this or any other university.

ABSTRACT

This thesis has two main aims. One is to make a contribution to the rather sparse literature on the history of British psychology. Another is to present a series of studies on the way in which scientific knowledge is socially constituted. The approach adopted has been to proceed on the basis that the form and content of scientific knowledge cannot be understood in isolation from the social context in which it is produced. It is argued that the history of psychology has involved the constitution of particular conceptions of nature and human nature, and that it is through these presuppositions that one path lies by which psychological knowledge is linked to its social context.

The thesis falls into three parts. The first discusses the institutionalization of experimental psychology in Victorian Britain through a consideration of the journals in which psychologists could publish, the societies in which they were active and their place within the universities. The second part discusses one of the main themes which emerged in experimental psychology in this period. Through a discussion of the work of Alexander Bain, Francis Galton and others an account is given of the formation and development of the concept of mental ability and means for measuring it in Victorian Britain. The final part takes up another main theme in late Victorian psychology — the relation between mind and body. Through a consideration of the work of William McDougall, competing conceptions of the relation of mind and body are discussed. It is argued that the philosophical positions taken by McDougall and others on this issue must be understood in a wider social and cultural context. An account is then presented of how such presuppositions can structure scientific theories. This is done through an analysis of the main aspects of William McDougall's published work.

PREFACE

The writing of a doctoral thesis involves the accumulation of a number of debts, both intellectual and personal. I would like to thank all those who helped in one way or another in the course of my research. Particular thanks must go to the library staff of the University of Manchester, especially for coping with my many requests to consult dusty volumes from the library store. I would also like to thank the staff of the Inter-library Loans office for dealing with my at times seemingly endless inquiries. The staff of the Jewish Library of Manchester Central Reference Library were also a great help with part of the research for this thesis, particularly in their forbearance of several weeks of requests to consult volumes of the 'Jewish Chronicle'. During the course of my research I spent a considerable time in the Manuscripts Room at University College, London. I would like to thank Janet Percival and her staff for their friendly reception and valuable help in long hours of examining the papers of Francis Galton. A further acknowledgment must go to Mr. Sakne of the British Psychological Society for enabling me to consult papers in his care.

On a more personal level, my greatest thanks must go to my Supervisor, Jonathan Harwood for his many comments and much advice, for coping with a thesis whose subject rapidly diverged from my original aims, for patiently awaiting each instalment and for giving much needed encouragement. I would also like to thank those who commented on parts of this thesis, particularly Roger Smith and Maureen McNeil for reading an earlier version of the material in Chapters six and seven. Researching a thesis of this nature can be a very isolating experience, and I would like to thank those who made it less so, particularly Tim Lang, Dougie Russell and others from the B.S.S.R.S. Todmorden Group, and Phil

Blackburn, Ken Green and Sonia Liff for providing intellectual and political stimulus in other areas. The final production of this thesis has not only necessitated considerable energy on my part, it has also required considerable manual labour. I would like to thank Yvonne Aspinall for typing this thesis with great accuracy and skill and for persevering with my often tortuous handwriting.

Finally, I would like to thank David Bloor of the Science Studies Unit at the University of Edinburgh, whose undergraduate course first stimulated my interest in 'Science, Technology and Society'.

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CHAPTER 1

INTRODUCTION

... ideology is fundamental — not a factor, not a contaminant, not intruding from the social context but constitutive. It doesn't only influence the choice of topic, the sort of questions asked and the kinds of answers which count as answers. All these criteria are shaped by ideological considerations, but they also work at a much deeper level, affecting the constitution of fundamental views of nature and society. We begin by treating nature as a manifold i.e. terrain so complex that it is amenable to many interpretive frameworks. Values, needs and social orders make selections from the myriad of perspectives or overlays which could be applied to Nature... Ideological constitutiveness does not change the number of planets, the speed of light, or the freezing point of water, but it fundamentally affects conceptions of planetary systems, cosmological frames of reference, and classifications of states of matter. Above all, it directs and frames our inquiry — what to think about and how to think about it.

Robert Young, 'Science is a Labour Process', Science for People No. 43/44 (1979), 32.

In recent years a growing number of studies have appeared which treat the production of scientific knowledge as a social process, conditioned by the particular historical contexts in which it is developed. One of the aims of this thesis is the presentation of case studies of experimental psychology from this perspective. A second aim has been to make a contribution to the rather bare catalogue of secondary literature dealing with the development of experimental psychology in Britain.

Initially I did not intend to write the thesis which follows. When I began researching, my aim was to produce a study of aspects of experimental psychology in Britain in the period 1900-45. After examining the secondary literature and some of the main primary sources I realized that the task which I had set myself was much more difficult than originally thought. I found it almost impossible to consider the post 1900 development of British psychology without a clear idea of the intellectual and institutional history of the discipline before this date. Some of the themes and approaches which I wished to study were already formed to a great extent by the early years of the present century. Further, I found a great deal of the available secondary literature actively unhelpful in alleviating the situation in which I now found myself. Accordingly, I felt distinctly uncomfortable about basing a study on such a shifting bed of sand of unknown depth and began more and more to retreat chronologically. As a result, my plan of looking at twentieth century British psychology was abandoned in favour of the series of studies of the formative years of the development of the discipline in this country which form the subject of this thesis.

Science and Culture

For some time the history of science has been a discipline racked by controversy. Widespread disagreement exists about how science develops, the epistemological status of scientific knowledge and the methods which one should use in doing the history of science.[1] In recent years increasing

numbers of historians and sociologists have been concerned with charting the links between natural knowledge and its social context. Although a considerable amount of important work has been produced this approach has not gone unopposed. Some historians have felt the emphasis on science as a social activity has diminished the primacy of internal explanations based on the close study of experiments, observations and theories. Others have persisted in arguing that the space available for the social history of science is limited. As Thomas Kuhn put it:

> ...there seem at times to be two distinct sorts of history of science, occasionally appearing between the same covers but rarely making firm or fruitful contact. The still dominant form, often called the 'internal approach' is concerned with the substance of science as knowledge. Its newer rival, often called the 'externalist approach', is concerned with the activity of scientists as a social group within a larger culture.[2]

No one seriously doubts that there is a relationship of some kind between science and the social context in which it develops. The question at issue is what the nature of this relationship is, and how far one can go in connecting scientific knowledge with the culture in which it is set. One perspective on this connection has been provided by Ben-David. In his The Scientist's Role in Society (1971) he argued that although there existed the possibility that social context influences the development of science by drawing attention to certain subject areas rather than others, the result of this is rather limited:

> ... although societies can accelerate or decelerate scientific growth by lending or denying support to science or certain parts of it, they can do little to direct its course. This course is determined by the conceptual state of science and by individual creativity — and these follow their own laws...[3]

Thus he argues that the pace and direction of the 'advance' of scientific knowledge can be affected in some way by the social context. Although he allows that content can also be affected this is only viewed as a negative influence, for example as in the case of Nazi genetics or Stalinist agrobiology.

In contrast to Ben-David's approach, it has been argued by numerous historians and sociologists that this 'influence' of society on science can be put in a much stronger way: the form and production of new ideas and the process whereby they are accepted or rejected can be affected by social factors 'internal' or 'external' to the scientific community. Recently, increasing numbers of historians have been concerned with identifying links between natural knowledge and its social context. The first steps towards such a contextual history of science have already been taken and there exist a number of concrete studies which analyse the production, evaluation and acceptance of scientific knowledge as social processes.[4]

The theory laden nature of statements about the natural world and the way in which scientific knowledge is not completely determined by 'reality' are widely accepted and there is no need to argue once more for the validity of such a viewpoint here.[5] The task now facing the historian of science is the refinement and clarification of the ways in which scientific knowledge is constituted. What is needed is an attempt to demonstrate the exact links between accounts of the natural world and society. As Shapin has argued:

> The mere assertion that scientific knowledge 'has to do' with the social order or that it is 'not autonomous' is no longer interesting. We must specify how, precisely, to treat scientific culture as a social product.[6]

The question must be posed: How exactly is scientific knowledge connected with its social context?

In general terms, scientific knowledge is the product of a dialogue between scientist and 'reality'. External nature is not apprehended directly but is inescapably mediated through human consciousness. It is because the natural world is not known directly, but only through theories which are developed about it that scientific knowledge must be viewed as a product of its social context. The type of theories which are developed are subject to social influence of various kinds and at various levels.

Perceptions are not neutral, unequivocal reflections of 'reality', but depend on non-empirical conceptual categories. Essentially, theories are preferred ways of thinking about the natural world. They are not, however, infinitely flexible, but are constrained by the phenomena which they seek to apprehend.

Given that scientific knowledge is inescapably socially constituted there are several aspects of this process which can be studied. One could examine the processes involved in observation and experiment;[7] the influence of professional vested interests;[8] the effects on knowledge of the professionalization of science in the late nineteenth century.[9] The approach adopted here is to consider the taking up within science of intellectual resources associated with other forms of culture. This approach stresses the assumptions and commitments which scientists possess in one sphere of their lives being transferred to their scientific work. One well known example of this type of approach is Robert Young's study of Darwinism.[10] In this paper he demonstrated that ideas associated with the early nineteenth century Malthusian debates over the correct distribution of wealth and power in society were also taken up by writers, including Darwin, concerned with the scientific understanding of the distribution and succession of organic forms. Young argues that there was a 'common context' in which concepts used in moral and political thought were also employed in the natural sciences. In this he stresses that it was not only Malthus's theory about population which was deployed but also his more basic assumptions about nature. It is this stress on the importance of basic assumptions employed in considering the natural world which seems to me to be of crucial importance. One could cast such an argument in very general terms and indeed Young has done this with regard to the metaphysical assumptions underlying modern science. At the deepest level world views or philosophies of society are historically constituted and within different periods of history different priorities and conceptual frameworks arise.[11]

One can, I believe, press these considerations into service at a more specific level. I would argue that the development of experimental psychology has involved the making and remaking of conceptions of nature and of human nature. The historian considering the development of psychological theories needs to be sensitive to the underlying image of human nature which they embody. As Buss has argued, what is needed is an approach which

> ...involves a contextual analysis of....psychological theories and ideas...that penetrates to the underlying values and image of humanity that are presupposed.[12]

These images of human nature are inescapably moulded by the social context in which they are produced. Thus, in abstract terms the move is from a socially constituted historically specific model or image of what human nature and the 'mind' is, to particular theories about the mind based upon these assumptions. In practice, of course, the situation is much more complex than this static presentation. The chapters which follow will spell out this approach in a more historically sensitive manner.

It is also important to recognize that new scientific theories are not simply <u>produced</u> socially, they are developed in the context of <u>already existing</u> traditions of knowledge and theorising. This tradition can be drawn upon, utilized or altered in the service of particular approaches. A theory of knowledge is also needed which recognizes how, with the elaboration of empirical detail, a system of knowledge becomes relatively self sustaining and independent of immediate social interests. I have attempted to maintain a hold on these perspectives in order to present a more rounded approach to the production of knowledge than has often been given.

One further comment of a historiographical nature is necessary here. It will be noted that most of the chapters which follow focus on the work of particular psychologists. I hope that I have not simply provided a straightforward biographical account of these people and their work. There is a deeper historiographical question at issue here. Considerable interest has recently been shown in an approach to history which can

loosely be labelled 'structuralist', based to a great extent on the work of Michel Foucault.[13] This approach appears to entail a study not of the text and the author but of the 'discourse'; in other words an anatomy of arguments. It seems to involve abandoning attempts to read texts as self-contained entities and to investigate the intentions of specific authors, in favour of establishing a general, impersonal pattern of concepts and arguments. Indeed, one recent study of the history of mental measurement in Britain (Rose: 1979) adopted precisely this approach. In his long and interesting paper Rose states that he is not seeking to search for the origins of psychological knowledge or the causes which constitute it in a particular way at a particular time. He also explicitly attacks attempts to treat knowledge in this way.[14] His project is to

> delineate the singularity and specificity of the different discourses and practices involved...the play of their relationships and dependencies, the possibilities opened up by their correlations and consequences.[15]

Although Rose's analysis is indeed of value, he does treat the production of scientific knowledge in abstraction. While showing some sensitivity to the context in which psychological theories might be deployed in the services of particular interest groups, these theories are themselves presented apart and divorced from the intentions and social position or concerns of their proponents.

Fundamentally, I would take issue with this approach and argue that it is not enough to establish the internal history of ideas and chart the deployment of scientific theories for specific purposes. In addition the context provided by evidence of the author's intentions and by the social concerns and connections of the period must also be considered. Unless the historian is to abandon the attempt to know what happened and why, and to explain change and development, it is crucial to consider the social and intellectual context and the social position and aims of those involved.[16]

The Historiography of Psychology

Almost two decades have passed since Robert Young published an

extensive critique of what was then the orthodoxy in the history of psychology.[17] Although changes have occurred since then and a great deal of important work has been done, many of the faults remain. Young criticized much of the history of psychology for relying far too much on secondary sources rather than delving into the primary literature; for often adhering to a 'great man' view of history; for distorting the way in which historical events actually occurred by failing to respect the way in which problems were seen at the time. Another of his criticisms was that the history of psychology had remained too long under the shadow of E.G.Boring's A History of Experimental Psychology. Although Boring's work remains indispensible it is too often, even now, taken to be the history of psychology rather than as a starting point for further investigations. More general surveys on the theme of the history of psychology from ancient Greece to the present day, largely derivative of Boring, continue to be produced and reissued in new editions.[18]

Another theme which can be discerned when reading the literature is that there remains a basic uncertainty about what the history of psychology actually is. This is exhibited in almost any issue of the publication which has done most to promote the subject - The Journal for the History of the Behavioural Sciences.[19] Until recently almost all books and articles on the history of psychology were written by working scientists. Their interest and viewpoints have naturally led them to stress the history of problems of current interest. This history is often written backwards from the point of view of the modern textbook. Criticism of this ahistorical practice has been forthcoming from within the discipline. In the first volume of The Journal for the History of the Behavioural Sciences George Stocking presented a critique of the mainstream approach to the subject.[20] Taking his cue from Butterfield's well-known Whig Interpretation of History (1931), Stocking sought to distinguish between two approaches to the subject: "presentism", understanding the past for the sake of the present; "historicism", understanding

the past for the sake of the past. When working psychologists look at the history of their subject the history they engage in is likely to be 'presentist'. This is due to the demand that the past be related to and even useful for furthering professional activities in the present. In Stocking's view the obvious pitfalls of the 'presentist' approach need to be borne in mind, what is needed is a 'historicist' approach which considers knowledge and events firmly in their historical context. Since Stocking wrote this critique many more large-scale surveys of the history of psychology, many of them written as the story of inevitable progress towards present day theories, have been published. In the U.S. a whole 'school' of the history of psychology has grown up which treats the subject as a tool for use by working psychologists and the subject is being taught as an integral part of undergraduate psychology courses.[21]

In recent years, however, a great deal of illuminating work has been produced in the United States which does owe more to scholarship than anecdote. One could here mention biographical studies such as Dorothy Ross's work on G.S.Hall, Michael Sokal's on J.M.Cattell, and Matthew Hale's on Hugo Munsterburg; the work of Russell Marks on intelligence testing and that of Hamilton Cravens on the broad sweep of twentieth century U.S. psychology. Recent reappraisals of the German experimental tradition, particularly of Wundt's work are also important.[22]

In stark contrast to the great interest in the subject in the U.S. the history of psychology in Britain remains in an almost non-existent state.[23] The publication of Hearnshaw's still useful Short History of British Psychology (1964) has not been followed by many detailed studies and several produced recently consistently fail to come to grips with the issues or the literature.[24] I hope that the studies presented here will help fill this gap.

The Argument: A Summary

The period on which this thesis focuses runs from the 1850s to the First World War. Before the mid-nineteenth century psychology was well

established as a subject for discussion both in Britain and elsewhere. Prior to this period, however, psychologists did not rely on the use of experimental techniques. It was only in the period under study that experimentation became a firm and accepted part of psychology and that a separate disciplinary identity was forged by people who could call themselves professional psychologists.

The chapters which follow are gathered around three main themes. One is how experimental psychology developed into a separate discipline in Britain with journals, professional societies and university departments. Another theme is the development of conceptions of mental ability and methods for measuring it. A third is competing conceptions of the nature of 'mind' and how it relates to 'matter'.

Chapter 2 surveys the institutionalization of experimental psychology in Britain. I argue that a study of the emergence of experimental psychology in Britain must encompass the constraints and encouragement due to broader social and cultural factors. The major part of this chapter concentrates on three main aspects of the institutionalization process: journals, professional societies and the establishment of psychology departments and laboratories in universities.

Chapter 3 concerns the origins of mental testing in Britain. I argue that contrary to the impression given by many existing accounts, the development of mental testing was not merely a technical innovation; it also embraced the constitution of a particular way of viewing human nature. The discussion focuses on the work of Alexander Bain, perhaps the most respected psychologist in Victorian Britain. Bain played a key role in the development of the psychology of individual differences. For much of his life Bain was deeply interested in individual mental differences and in his published works he discussed the subject fully and extensively. I argue that the image of human nature to be found in Bain's writings was, at a general level, a naturalization of the increasing

division of labour in British society. On a narrower focus, his writings were a product of his place in the changing social structure of Victorian Britain, in which existing power structures were breaking down and new social groups emerging.

This theme of the development of mental testing is continued in Chapter 4 which concentrates on the contributions of Francis Galton and a small group of 'followers' to the development of mental tests and mental measurement. Although Galton has been the subject of several studies, there rather surprisingly exists no substantial historical study which concentrates on his psychological writings. I take issue with the orthodox conception of Galton as a lone figure developing mental tests almost in isolation from existing theoretical traditions and other researchers. Instead, I argue that he drew heavily upon existing ways of viewing human beings (in terms of the possession of more or less 'mental ability') and methods for measuring the mind. I also argue that the view of human nature embodied in Galton's writings was a product of his social and political commitments and his place within the social structure of Victorian Britain.

In Chapter 5 I follow this discussion of the 'Galtonian' tradition of mental measurement by focusing on a series of studies produced by Joseph Jacobs relating to the mental and physical ability of Jews. Jacobs was a Victorian polymath who occupied a prominent position in the British Jewish community. I argue that the very detailed studies which he produced were motivated and shaped by a concern about anti-Semitism and Jewish immigration into Britain from Europe. Jacobs used the methods of physical and mental measurement developed by Galton to mount a defence of Jews and Jewish immigrants. The subject of this case study constitutes an important, though neglected, application of Galton's ideas.

Chapters 6 and 7 tackle other important themes in Victorian psychology. Through a detailed discussion of the work of William McDougall

these chapters probe Victorian thought concerning the relation between body and mind and the consequences of particular conceptions of this relation for the form of psychological theories. McDougall was without doubt the major British psychologist in the first decade of the twentieth century and made important contributions to physiological psychology, the psychology of behaviour and to evolutionary theory. I argue that his conception of the human organism as set in action by a non-material entity was a particular response to the social changes occurring in Victorian Britain. Like many other intellectuals he shied away from traditional religion and passed through a personal 'crisis of faith'. He did not, however, seek to embrace an outright materialism and professed a variety of vitalism which would be amenable to investigation by the methods and approach of natural science.

In Chapter 7 I argue that McDougall's conception of human beings had far reaching implications for the psychological work which he produced. His physiological psychology, psychology of behaviour and his contributions to evolutionary theory were all, I argue, premised on his belief in vitalism.

The approach taken in this thesis is to treat scientific knowledge as inextricably bound to the social context in which it is developed. In particular, in the case of psychology it is of crucial importance for the historian to consider the general way in which the natural world has been 'framed' and how this framing is linked in a multitude of ways both to previously existing knowledge and the society in which it is produced.

Chapter One

Notes

1. See (Macleod: 1977) for an excellent survey.
2. (Kuhn:1968, 76).
3. (Ben-David: 1971, 11-12).
4. See (Shapin: 1982) for an excellent survey.
5. See for example (Barnes: 1974, Chap.3; 1977, Chap.1).
6. (Shapin: 1979, 42).
7. See for example (Wynne: 1976), (Pickering: 1981).
8. (Barnes, Mackenzie: 1975).
9. (Turner: 1974a; 1978), (Jacyna: 1980).
10. (Young: 1969).
11. (Young: 1977a 66, 71; 1979).
12. (Buss: 1979, ix).
13. For a discussion of Foucault's works see (Weeks: 1982), (Guédon: 1977).
14. (Rose: 1979, 6, 61).
15. Ibid, 6-7.
16. See (Skinner: 1969; 1974; 1978, x-xii), (Dunn: 1968, especially 98).
17. (Young: 1966).
18. See for example (Klein: 1970), (Shultz: 1981), (Watson: (1965) 1968). For an excellent account of the history of the history of psychology see (Ash: 1983).
19. cf. (Young: 1973b,180): "The history of psychology is a discipline whose relationship with psychology and with the history of science has yet to be defined."
20. (Stocking: (1965) 1968a,1-12).
21. See for example (Brôzek, Pongrantz: 1980.), (Buss (ed.):1979), (Ash: 1983), also (Smith: 1982) for a critique. The 1970s saw the production of several bibliographic tools for the would-be historian of psychology, for example (Viney et al.: 1979), (Watson: 1978).
22. (Ross: 1972), (Sokal: 1972; 1980), (Hale: 1979), (Marks: 1981), (Cravens: 1978), (Danziger: 1979b; 1980), (Bringmann: 1975).
23. For a survey of the European situation as a whole see (Brozek:1975).
24. See for example (Evans, Waites: 1981). An exception to the dearth of good history of psychology has been the work of students of Robert Young at Cambridge; see (Smith: 1970; 1973; 1981), (Cooter: 1978), (Durant: 1977), (Bynum: 1974), (McNeil: 1979).

CHAPTER 2

THE PSYCHOLOGICAL ENTERPRISE IN VICTORIAN BRITAIN

I have given a special heading to... (psychology) ... because its emergence as a definite line of experimental research seems to me one of the most important features in the progress of science in the past quarter of a century.

E. R. Lankester
Presidential Address to the
British Association, 1906.

In his opening address to the Second International Congress of Psychology, held in London in 1892, the philosopher Henry Sidgwick declared that:

> England has fallen somewhat behind in the recent movement of psychology in the experimental direction. English psychologists have hardly taken any part in the efforts that have been made during the last thirty years to convert psychology into an exact science by precise experimental determination and measurement. [1]

Sidgwick was speaking at a time when there were as yet no laboratories or university departments devoted exclusively to the 'new' experimental psychology in Britain. His judgement is, however, rather harsh. Since the mid-nineteenth century a number of psychologists in Britain were extremely interested in the 'new' psychology which was being developed on the basis of the pioneering work of Weber, Wundt, Helmholtz and others in Germany. Although no university departments or laboratories existed there was an extensive network of institutions, journals and personnel in which the subject was earnestly discussed. Soon after the turn of the century, however, the situation had begun to change, as the quotation at the head of this chapter suggests. By this time two official and one 'unofficial' laboratories had been established in British universities and the number of academic posts in psychology was growing, although slowly.

My aim in this chapter is to survey the geography of the institutions through which British psychologists expressed and organized themselves, and found employment in late Victorian Britain. This is a necessary preliminary discussion to the studies which follow.[2]

The Development of Experimental Psychology in Britain

The past two decades have seen the publication of a large amount of research within the history and sociology of science relating to the development of new disciplines. This work has ranged over a wide body of

scientific specialties and a considerable timespan.[3] Most of this literature has tended to concentrate on disciplines which have had some measure of fairly rapid 'success' or whose emergence was clustered around a particularly prominent 'research school'. In contrast, in the case of the development of experimental psychology in Victorian Britain success, in terms of the practitioners' aims and the construction of a distinct disciplinary identity, was slow in coming and no coherent and well organized research school can readily be identified. In confronting this situation the historian must of necessity consider the social and cultural constraints on the emergence of the new area of study as much as upon the institutional framework within which it developed.

One of the earliest discussions of the development of new scientific disciplines was that of Hagstrom. He argued that new disciplines emerged when competition for recognition and status within an established field became intense and research became subject to diminishing returns in terms of recognition and status. In these circumstances, he argued, scientists would tend to move out of that specialty into and perhaps creating another, where recognition now more easily gained. This perspective stems from his central preoccupation with the system of 'social control' within the scientific community.[4]

An example of this type of approach is the much cited and quoted paper by Ben-David and Collins on the emergence of experimental psychology.[5] They convincingly argue that good and productive ideas are not in themselves sufficient for the emergence of a new specialty. For the latter there must exist a network of scientists interested in the area, a means of communication between them, a mechanism for the recruitment and training of new practitioners and the provision of financial or other resources. Some of their analysis dealing specifically with experimental psychology is not, however, so convincing. Their central thesis is that the creation

of a new scientific identity (or 'role') precedes and makes possible the formation of a new scientific perspective. They maintain that during the 1850s and 60s there were in Britain and France a number of comparatively isolated people interested in the experimental study of the mind and that there was neither a communications network to transmit ideas nor research 'roles' specifically devoted to those ideas. In contrast, they argue that in Germany a new research role and network of institutional and social links was developed. They see this as having occurred through a movement of researchers out of physiology (where opportunities for professional advancement were declining) into mental philosophy (where academic competition was less severe). Since the status of philosophy was low the migrants developed the use of experimental methods in an attempt to improve it.

Ben-David and Collins have been criticised on several grounds, notably for placing great emphasis on the career development of Wilhelm Wundt and for neglecting the separate origin of experimental psychology in the U.S.[6] Their thesis can also be criticised in several other ways. For example, their portrayal of 'mental philosophy' at this time is a caricature of what was actually occurring in Britain; for example, some people who became heavily involved with experimental psychology began primarily as philosophers, some shifted their interest from philosophy to psychology at a time when there was no prospect of an academic post. More importantly, I would argue that their account tends to be abstracted from the wider social and cultural context outside the universities and is too narrowly focussed to encompass the subtlety of the actual historical events.

The analysis of Ben David and Collins is, however, useful in several respects, for example they are correct in stressing the importance of developments in Germany. In the late nineteenth century German universities drew students from far and wide, particularly in the sciences, because of

the combination of teaching and research in the German university system. Once a tradition had been established students, especially from the United States and Britain, flocked there seeking an advanced research oriented education.[8] A large number of American students went to Germany, to Göttingen with Lotze, or Leipzig with Wundt. The experience which students such as J. M. Cattell gained there was to prove an important factor in the development of experimental psychology in the U.S.[9] Many British students were also attracted mainly because of the research orientation of German universities and their much broader curriculum. Most leading British psychologists of the period prior to 1914 spent some time studying in Germany, first at Göttingen with Lotze, then at Leipzig with Wundt, then Würzburg with Oswald Külpe. For example, James Ward and James Sully studied with Lotze, Charles Spearman and W. G. Smith studied with Wundt, William McDougall with G. E. Müller at Göttingen.[10] Just after the turn of the century Wurzburg became a centre which provided training for a number of important British psychologists, with H. J.Watt, Cyril Burt, J. C. Flugel, C. W. Valentine, and T. H. Pear studying there between 1902 and 1909. It is important to recognise that British students not only gained intellectually from the training which German universities had to offer, they also brought back with them a particular cultural experience.[11]

Although the new discipline of experimental psychology initially 'took off' in the German university system its leading edge lay, increasingly, in the U.S. Here William James, J. M. Cattell, G. Stanley Hopkins and others explicitly set out with the task of promoting the nascent science within American higher education and the U.S. scientific community. They founded research programmes, journals and professional psychological organizations. By the early 1900s they were succeeding in their campaign to persuade school administrators, professional educators, social workers, mental health professionals, business leaders, foundation executives and

government officials of the wide relevance of psychology. Between 1884-98 American universities granted 54 doctorates in psychology, in 1899-1908 the number was 139, 1909-18 it was 234. By the end of this period there were 25 universities granting doctorates.[12]

At least part of the reason for the relatively rapid spread of experimental psychology from Germany to the U.S. and its slowness in building up a body of practitioners in Britain is due to the differing institutional settings. American higher education developed in such a way that it was especially receptive to the more successful aspects of the German system. Only here did the German system of combining in a university the functions of teaching and research rapidly gain ground.[13]

It would, however, be a profound misconception to equate the 'new' psychology simply with the emergence of a professionally organized and self-consciously defined group of specialists.[14] In Britain such a professionally organized grouping never, as I argue below, really developed before the turn of the century to anything like the extent it did in the U.S. Yet, British psychology in 1900 was radically transformed from its appearance of fifty years earlier. Neither should one equate the 'new' psychology simply with the introduction of experimentation. Of crucial importance was the forging of a view of human nature which made it possible even to conceive in a thoroughgoing manner of a science of the mind. The very act of setting up a psychological laboratory signified a willingness to accept the idea that the mind could be studied with the instruments and assumptions of 'modern' evolutionary natural science. There were of course debates and disagreements about the role of experimentation or about whether it was necessary or desirable to use trained subjects in experiments; what was not at issue at the turn of the century was the applicability of an experimental approach to the mind.

To gain an adequate picture of the development of experimental

psychology in Britain one has to consider factors other than institutional ones, or the state of the 'reward' system, or the opportunities for forging a new scientific role (as Ben-David and Collins suggested). It is of fundamental importance to consider the wider social significance of attempts to develop an experimentally based approach to the study of the mind and to view science as an integral part of wider culture.

The development of an experimental approach to the phenomena of the human mind had a wider cultural significance in Victorian Britain and was closely integrated with broader debates then being conducted among Victorian intellectuals in general. Experimental psychology formed part of a general movement towards a naturalistic view of human beings. The period in which experimental psychology emerged was one in which there was an intense public struggle among intellectuals in Britain over valid ways of conceiving the natural world. On the one hand proponents of the naturalistic approach, as it was termed at the time, such as T.H.Huxley, and John Tyndall argued that the universe could be adequately comprehended by the methods of modern evolutionary science; the introduction of divine power was neither necessary nor desirable. On the other hand, various clerics and supporters of the established church enthusiastically battled against this seemingly spiritually barren and godless approach. This whole 'conflict' was at a deeper level embedded in the social fabric of late Victorian Britain and was the embodiment of a struggle for authority between the old establishment such as the professions of law and the ministry and the growing band of professional scientists. It was a struggle over who should have authority in society as well as over what particular cosmology was valid.[15]

The proponents of the new approach to the study of mind, such as Alexander Bain and Herbert Spencer, challenged the identification of the mind as the property of a spiritual entity. They insisted on relating mind to the material conditions in which it originated; mental phenomena

were to be considered as a product of the organism in its relation with the environment. They further considered that the traditional introspective approach to psychology was inadequate and that experimentation was a necessary adjunct to it.[16] In the context of Victorian Britain this attempt to develop a psychology which did not conceive the universe in material and spiritual terms was subject to constraints in several ways.

Most importantly, concern was expressed over what was viewed as its possible moral implications. In particular, it was felt by some observers that such an approach could lend credence to materialist or fatalistic theories of human conduct. The way in which the universe was conceived was held to have significance for the regulation of individual behaviour and controversy centred on the question of whether an external power was needed to enforce the 'moral law' and to secure the 'social order'.[17] In the Fortnightly Review, in which a long debate over the validity of a naturalistic approach took place, W. L. Courtney argued that if Conscience was

> ... only a function of physical organization, it is more than ever difficult to see whence will be derived the power of ethical sanction.[18]

British psychologists who acclaimed the innovations in psychology in Germany and who supported attempts to develop a science of the mind were torn by conflicting allegiances. Because of their place within the Victorian intellectual community they were sensitive to the question of the foundations of the moral order. They were also aware that its basis could be undermined by the challenge which the 'new' psychology made to Volition and Freewill. Consequently, in a variety of ways the psychologists sought to come to terms with these contradictory loyalties.[19]

The general drift of this discussion has been to suggest that a consideration of the emergence and institutionalization of experimental psychology in Britain must encompass broader social and cultural factors than that allowed for by, for example, Ben-David and Collins. Further,

the relatively slow development of an experimental approach to psychology in Britain cannot solely be attributed to the absence of institutional support or the supposed philosophical inclinations of psychologists such as Bain or Ward, as Boring has suggested.[20] Experimental psychology confronted practitioners in Britain with a perplexing choice between a scientific psychology and traditional beliefs in moral responsibility. What has been interpreted by one observer as the effects of a hostile philosophical climate might better be regarded as the effects of a debate over the cultural implications of the new psychology.[21]

In the remainder of this chapter I examine the way in which the discipline of experimental psychology developed in late nineteenth century Britain. I discuss this in three areas: the journals in which psychologists could express their views and publish papers, the societies they formed or joined, and the university departments, posts or laboratories in which they were involved. These institutional developments occurred against an ever present backdrop of the wider cultural context.

Spreading the Gospel

Until the closing decades of the nineteenth century psychologists, in common with members of other scientific disciplines, used the vast range of the Victorian periodical press as a forum for debate and the dissemination of knowledge. The mid-century saw a great rise in the number and range of interest of the periodicals which the Victorian reading public consumed. Publications such as MacMillan's Magazine and the Cornhill Magazine, and reviews like the Fortnightly, Contemporary and the Nineteenth Century provided a forum for contributors from a wide range of interests, including psychology. For example, Francis Galton used the pages of Frasers Magazine, the Nineteenth Century and MacMillan's Magazine; Croom Robertson the Nineteenth Century; James Sully the Cornhill Magazine, Fortnightly Review and Saturday Review. The use of

these organs by psychologists was facilitated by a network of personal, political and institutional linkages between journal editors and the authors. For example, James Sully and Croom Robertson were close friends of the Cornhill's editor, Leslie Stephen.[22] Through his friendship with Alexander Bain, Sully was introduced to John Morley, editor of the Fortnightly Review. The close political agreement and personal friendship between Morley, Bain and Sully facilitated the use of the pages of Morley's publication by the other two.[23]

In the 1870s and 1880s, however, as the product of the growing specialization of science and the development of more esoteric forms of discourse which reduced the accessibility of published contributions, the major popular periodicals began to exclude the more technical papers from their pages. At the same time new journals set up by the new professional academics themselves were established, providing an outlet for the rapidly rising spate of specialized and esoteric papers unwanted by the popular press.[24]

In January 1876 a new periodical publication appeared which was devoted entirely to philosophical and psychological issues. Its title was Mind - A Quarterly Review of Psychology and Philosophy. The editor was George Croom Robertson, a highly thought of young Scottish philosopher and psychologist. After studying at the University of Aberdeen Robertson had made a pilgrimage to that shrine of organized higher education, Germany, where he studied at Heidelberg, Berlin and Göttingen. On his return to Aberdeen in 1863 he renewed his acquaintanceship with Alexander Bain who had been one of his teachers at university. He then assisted Bain in revising his Senses and the Intellect and Emotions and the Will. In 1867, however, Robertson became Professor of Mental Philosophy and Logic at University College, a position he retained until 1892, the year before his early death. Robertson lived the life of a progressive public-

spirited academic. In addition to teaching he was involved in examining and administration, he gave popular lectures and was with J.S. Mill active in the movement for women's suffrage.[25] Robertson was thus one of the new generation of German-trained professional academics.

It was in summer 1874 that Alexander Bain first proposed to Croom Robertson that a new quarterly journal devoted to philosophy and psychology should be published. Bain undertook to underwrite the publishing risks and asked Croom Robertson to be editor. The latter agreed and Bain told Herbert Spencer, Henry Sidgwick and the Cambridge philosopher and logician John Venn, about his plans. All of them proved to be enthusiastic. Although Bain and Robertson had hoped to bring the journal out in 1875 they had difficulty in finding a publisher and it was not until January 1876 that the first issue appeared.[26] From this first issue until Croom Robertson's resignation as editor (due to ill health) in 1892, Bain supported the journal financially. Over the sixteen year period it cost him over £3,000.[27] To begin with Bain made the rather rash commitment to pay contributors to the pages of Mind. For example, in 1879 Croom Robertson wrote to Francis Galton asking if he would like to contribute and apologizing that:

> I have only very modest expenses to draw upon for the remuneration of such writers as are asked to contribute to ... (the journal's)...pages, but I believe that most of those whom you would like to address — whether abroad or at home — would be reached through the journal. [28]

Shortly after this, however, Bain was forced to restrict payment to authors of critical notices of books because of the cost involved.[29] In his farewell as editor Croom Robertson paid tribute to Bain's support of Mind saying that its publication

> ...has been rendered possible by the public spirit of one man. Why should it not now be openly told, that but for Professor Bain's generous initiative in 1876 this country might still be without a philosophical organ? [30]

Throughout his editorship Croom Robertson devoted a large part of his time

and energy to the journal. He dealt with its affairs, from soliciting articles and suggesting alterations, meticulously correcting misprints and bad grammar and contributing a good number of articles and reviews himself.[31]

From the beginning Mind published a wide spectrum of papers. The first issue contained articles as diverse as Herbert Spencer on the "Comparative Psychology of Man", John Venn on "Consistency and Real Inference" and James Sully on "Physiological Psychology in Germany". One of the most innovative aspects of the journal was its format. Each issue began with original philosophical or psychological articles, followed by "Critical Notices" of important books, by reports of current researches and by an important "Notes and Discussions" section in which readers commented on already published articles. Other sections contained abstracts of new books (including foreign ones) and finally, a news section which enabled the small but growing group of professional philosophers and psychologists to keep in touch. From the first volume the journal's promoters sought to ensure that philosophical and psychological, especially experimentally-based papers were represented. A few days after the first issue was published Croom Robertson wrote to Francis Galton saying:

> I write...chiefly to say that I shall be very glad if you will from time to time contribute directly to Mind and so keep and sustain and develop its scientific side.[32]

Although Robertson made every endeavour to solicit articles dealing with psychology, particularly the 'new' experimental psychology, he could only express his bitter disappointment in 1883, writing that

> I will not conceal my own feeling of disappointment that there has not been more of a positive contribution to psychological science in...Mind's...pages.[33]

He attributed this lack to the absence of psychology departments in British universities. A few years earlier in his editorial introduction to the first issue, Robertson had written that

> Philosophical thought in England has for the most part been based on psychology... and psychology, pursued as a positive science, ought to yield a continuous harvest of results... Few, however, of its cultivators will deny that it has been far from as fruitful as could be wished. ...Now, if there were a journal that set itself to record all advances in psychology, and gave encouragement to special researches by its readiness to publish them, the uncertainty hanging over the subject could hardly fail to be dispelled. Either psychology would in time pass with general consent into the company of the sciences, or the hollowness of its intentions would be plainly revealed. Nothing less, in fact, is aimed at in the publication of MIND than to procure a decision of this question as to the scientific standing of psychology.[34]

On the one hand Robertson viewed Mind as an organ of the new experimental psychology, on the other he saw it fulfilling a role in furthering the interests and activities of the growing number of professional academics. He began his editorial in the first issue by stating that

> The first English journal devoted to psychology and philosophy, MIND, appears in circumstances that call for some remark.
>
> That no such journal should hitherto have existed is hardly surprising. As long as English inquiry has been turned on the things of the mind, it has, till quite lately, been distinguished from the philosophical thoughts of other countries by what may be called its unprofessional character.[35]

To a certain extent Mind did fulfil its role as an outlet for the researchers of the new professional psychologists through its publishing of original articles by Galton, Sully, Bain and others; through its section where researchers could report on recent work; and through its "Notes" section in which announcements of general interest could be made. That it was unsuccessful was not a reflection on the journal's editor but a consequence of the slow establishment of psychology as an independent subject in British universities.

At the end of 1891 Robertson's period as editor came to an end. Continually troubled by illness, he resigned his position and university chair. His place was taken by G. F. Stout, who had been a student of James Ward's at Cambridge.[36] Stout remained in the post for the next twenty-eight years. His succession heralded several changes in the

journal's organization and later, content. On Robertson's resignation Bain intimated that he no longer wished to be financially responsible for Mind. After a period of negotiations financial responsibility was taken over by Henry Sidgwick who, in this and in many other ways, was to do so much to try and establish psychology as an independent subject in the universities. This arrangement continued until Sidgwick's death in 1900 and during this period the general management was in the hands of Sidgwick and his Cambridge colleagues. Mind continued to run at a financial deficit; in 1896 £60 and in 1900 £90. Financial assistance was given by guarantors and subscribers in Oxford, Cambridge and elsewhere.[37] It was from these informal beginnings that a 'Mind Association' was eventually formed in late 1900, although the scheme had been proposed by Sidgwick the previous year. This organization of subscribers and supporters took over responsibility for the journal's finances.[38]

Initially Stout continued the editorial policy followed by Robertson by publishing both philosophical and psychological articles and opening Mind's pages to those of all philosophical creeds. Gradually, against Stout's will, Mind became a journal by and for philosophers. In part this was a result of strenuous efforts by a younger generation of Oxford-based philosophers, especially F. H. Bradley, who were actively hostile to psychology.[39] In 1902 Herbert Spencer wrote to Bain on precisely this subject:

> 'I not infrequently think of the disgust you must feel at the fate which has overtaken Mind. That you, after establishing the thing and maintaining it for so many years at your own cost, should now find it turned into an organ for German Idealism must be extremely exasperating...Oxford and Cambridge have been captured by this old world nonsense. What about Scotland? I suppose Hegelianism is rife there also. [40]

This change was also, however, the product of a need by a new generation of professional psychologists occupying newly created university posts to establish a separate identity distinct from philosophy. As long as

the discipline of psychology was in an embryonic state with few practitioners and almost no university posts, Mind provided a suitable and convenient forum for the publication and dissemination of psychological knowledge. In 1903, however, a group of the new self-conscious psychologists got together to found the British Journal of Psychology. This rapidly became the academic psychology journal.

In early 1903 a group of five psychologists, three of whom had helped found a British Psychological Society two years previously, began to plan the production of a new scientific journal, the British Journal of Psychology. This group consisted of William McDougall, Reader in Experimental Psychology at University College, London; C.S.Myers, then working in the Cambridge University psychological laboratory; W.H.R. Rivers, lecturer in Experimental Psychology at Cambridge; James Ward, Professor of Mental Philosophy at Cambridge; Andrew Shand, a psychologist of independent means. In April 1903 they distributed a printed circular in which they stated:

> We believe the time has come for starting an English journal devoted exclusively to Psychology in all its branches, analytical, genetic, comparative, experimental etc. The number of workers in the subject has of late greatly increased so that the pages of Mind are no longer adequate to ensure the prompt publication of new work of even moderate extent and for long experimental papers it cannot find space at all. [41]

Before finally announcing the appearance of the journal they sent this note to those people they thought might subscribe or act as a guarantor against losses. The following year the first issue appeared edited by Ward and Rivers. In their editorial they emphasized the growing importance of psychology, stressing its relations with biology, physiology, pathology, philosophy and anthropology, and its important practical application in the hands of the educationalist, jurist and economist. They opened with the bold statement that

> Psychology which till recently was known among us chiefly as Mental Philosophy...has now at length attained the position of a positive science. [42]

In a similar way to Robertson's initial claims for Mind, they emphasized that the journal would represent no 'school' and would serve all those interested in psychology.

The journal contents were markedly different from Mind and were fundamentally of a much more technical nature. It did, however, keep a broad perspective and published some articles with a philosophical slant as well as those on experimental psychology. Particularly important in the early volumes were papers on physiological psychology. The sympathetic interaction between the two disciplines is emphasized by the presence of the physiologist C. S. Sherrington on the editorial board.[43] The founding of the journal emphasized that at last, several years behind Germany and the U.S., psychology was beginning to be seen as an independent discipline in Britain. Indeed, in their editorial in the first issue Ward and Rivers were at pains to stress the increased interest then being shown in psychology both at home and abroad, pointing to the establishment of laboratories and lectureships and the appearance of serial publications in other countries.[44] In addition to publishing papers the journal aided the practitioners of the new discipline in another way. When it first appeared it was suggested that abstracts of papers read to the British Psychological Society be published, but this was found to be impractical due to lack of space. The journal did, however, undertake to publish a list of all communications of the Society and to allot a certain space in each number to the Society's proceedings. The journal thus helped improve the self knowledge and self definition of the new community of experimental psychologists. This informal relationship between the Society and the journal remained until 1914 when under the editorship of C.S.Myers the British Psychological Society took over financial responsibility and control of the journal.[45]

In addition to Mind there were other journals which psychologists

could use before the establishment of the British Journal of Psychology. One was the Journal of the Anthropological Institute which published a series of papers on the interface of psychology and anthropology during the 1880s. The use of this publication by psychologists was largely due to the influence, prestige and power of Francis Galton, who was President of the Institute over the period 1885-88. During this time and after papers were published by Galton and a small band of researchers largely following up his ideas.[46]

Another place where psychologists published their work was in the neurological journal Brain. This was founded in 1878 by the asylum doctors J. C. Bucknill and Crichton Browne, and the neurologists David Ferrier and Hughlings Jackson. Its aim was to deal with subjects not adequately covered in other periodicals. In their introduction to the first volume the editors noted that although journals existed dealing with "Mind and Mental Disease" none existed which covered anatomy, pathology, and therapeutics of the nervous system.[47] They wrote that

> The functions and diseases of the nervous system will be discussed both in their physiological and psychological aspects; but mental phenomena will be treated only in correlation with their anatomical substrate.[48]

The form of the journal closely followed that of Mind — original articles, followed by signed critical reviews, digests of researches and by abstracts of foreign journals. In its early years the journal did publish some psychological articles.[49] In 1885 the acting editor Armand de Watteville wrote to the American psychologist J. M. Cattell:

> We shall always be glad to have any article on psychophysics you wish to publish in English.[50]

Brain also published papers by - for example - James Sully and Alexander Bain. At a time when the boundaries of psychology as a discipline were fuzzy and ill defined, before the academic division of labour had attained the rigidity of several decades later, psychologists were able to publish

and spread their ideas to audiences not explicitly interested in their subject. In doing so they were often at pains to stress the importance of their subject to their audience's particular specialism. For example, in a paper read before the neurological society in 1890 and published in Brain James Sully attempted to demonstrate how the subject of Attention was of interest both to psychologists and neurologists - both had something to contribute.[51]

In an environment in which their own status was uncertain, psychologists attempted to sell themselves and their expertise to other audiences.[52] As the disciplines became more stringently demarcated and their subject matters more specialized the option of utilizing the publications of other disciplines was no longer open to psychologists and soon the British Journal of Psychology became the main organ of the aspiring psychologists.

Clubbing Together

During the first half of the nineteenth century the distinguishing characteristics of British science were amateurism aristocratic patronage, little government support, limited employment opportunities and a peripheral role within the clerically dominated universities. From the 1840s onward the size, character, structure, ideology and leadership of the Victorian scientific community underwent considerable transformation. Between 1830 and 1880 the membership of all the major scientific societies markedly increased, with many doubling their numbers. There can be little doubt that the number of practising scientists also greatly increased during this period.[53] These years also saw a proliferation in the numbers of societies, for example the Physiological Society held its first meeting in 1876 and the Neurological Society began a few years later.[54]

Psychology, however, continued to occupy a highly marginal role in the British scientific community. Indeed, there was doubt as to whether

the subject could be included under the rubric of 'science' at all. In its Third Report, published 1874, the Devonshire Commission (on 'Scientific Instruction and the Advancement of Science') had no hesitation in limiting the scope of its inquiries to the "Sciences of Organic and Inorganic Nature, including...the Sciences of Number and Magnitude, together with those which depend on Observation and Experiment, but excluding the Mental and Moral Sciences". George Croom Robertson quoted this passage in his introduction to the first volume of Mind in order to demonstrate what psychologists had to fight against to gain a respectable position for their subject.[55] A decade later Alexander Bain, the leading and most highly respected British psychologist, could plead to an audience of the Anthropological Section of the British Association:

> My closing observation relates to the present position of the science of Mind, commonly called Psychology, in the programme of the British Association. Taken as a whole it is nowhere, it would not properly come into any section. Taken in snatches, it appears in several places; it would come under Zoology, which embraces all that relates to animals, under Physiology, in connection with the nervous system and the senses, and it figures still more largely, although in an altogether subordinate and scarcely acknowledged fashion, in the section on Anthropology. [56]

Nevertheless, it was not until 1901 that a Society was formed in Britain with the specific aims of furthering the status of psychology and the financial and public position of its practitioners.[57]

Despite the resounding failure of a distinct and organized body to speak on behalf of psychologists to emerge, proposals for such an organization were at least made public. At the Aberdeen meeting of the British Association in 1885 Joseph Jacobs, freelance journalist, historian of Jewry, turned anthropologist and psychologist, addressed a meeting on 'The Need of a Society for Experimental Psychology'.[58] Here Jacobs noted that societies already existed to promote the interests of everything from agriculture and ballooning to dentistry and engineering. Yet, although possessing both practitioners and an identifiable field of study,

Psychology had no society to represent itself. He then very perceptively laid out the functions which could be performed by such a society. It

> would fulfil the ordinary functions of similar institutions by affording a locale where fellow students might get to know each other and each other's work. It could collect at its rooms a specialist library, it could provide instruments needed in psychometry and now only accessible to persons with long purses or mechanical ingenuity. It could publish memoirs, Jahresberichte of progress in the various branches of the science, and supply a much felt want by encouraging the compilation of classified bibliographies on special problems.[59]

But despite Jacob's illuminating plans such a society was not forthcoming for almost two decades.

In his "Preforatory Words" to the first volume of Mind Croom Robertson voiced the opinion that mental philosophy in Britain was to be distinguished from that of other countries by "what may be called its unprofessional character".[60] He unashamedly wrote that one of his main aims in editing Mind would be to help transform the status of the group of people interested in psychology, hopefully turning them in the direction of an organized professional body. Nine years later he opened the 1887 volume with an extremely despondent article in which he bemoaned the fact that psychology had hardly made any progress towards being an organized field of study and that the number of people in Britain who identified themselves as psychologists remained small. He also lamented that the journal had not yet succeeded in promoting the habits of specialized investigation in psychology which were characteristic of the work of practitioners in other branches of science.[61]

In a situation where the boundaries of psychology were fluid, where there was no hard and fast distinction between psychological and other related fields of knowledge, psychologists could in the absence of a forum of their own, find a niche within professional societies in related fields. For example, several psychologists such as James Sully and William McDougall, were members of and read papers to the Neurological Society, and

as I noted earlier a number of psychological papers were read to the Anthropological Institute at the time of Galton's Presidency in the 1880s.[62] In gaining an audience and role within other societies psychologists appealed to the shared concerns and interests of both disciplines.

In late nineteenth century Britain some psychologists devoted part of their energies to the possible practical applications of their subject. Several such as Sully, Ward and Bain firmly and honestly believed that psychology could contribute a great deal to education. One can also, however, interpret this concern for the practical application of psychology in a different light, in terms of the benefits to psychology and psychologists of appearing to have practical value. Sully began his career as a Lecturer in Education at Maria Grey Training College in 1878 and the following year was appointed as Lecturer on the Theory of Education at the College of Preceptors.[63] In 1882 he published his Teacher's Handbook of Psychology in which he wrote that "the art of education is now seeking to ground itself in scientific truths or principles".[64] Ward, in his Psychology Applied to Education, a course of lectures given in 1880 but not published until 1926, wrote that a "science of education is possible, and that if realized it would be of the greatest practical importance."[64] In 1879 Bain's Education as a Science, which was to become a classic text in experimental pedagogy, was published. Psychologists believed that they had something to contribute to education and at the same time saw it as a means of furthering their own group interests. On the other hand, educationalists treated psychology as a means of giving authority to the study of education and lending it 'scientific' legitimacy.[65] In the aftermath of the 1870 education act and the 1872 Taunton Commission groups of teachers began to think in terms of training.[67] In common with other occupational groups they sought to transform their occupation into a profession. Various facets of this process such as the enhancing of status,

raising qualifying standards, fending off outside control by making education a more esoteric and highly technical field based on science, helps provide an explanation of why they were interested in psychology.[68] One symptom of this desire on the part of educationalists to make their subject scientific and therefore a legitimate topic and pursuit was the founding of a "Society for the Development of the Science of Education" in 1875.[69]

The main instigator of the Society was C. H. Lake, headmaster at Oxford House, a boys' school in Chelsea.[70] In 1875 Lake wrote to the Journal of Education:

> If the art of Education is to advance, and the practice of education to improve, it is desirable that the present generation, educated as it has been by experiment, should be familiarized with the notion that Education is a science founded upon intelligible and certain principles.[71]

He then proposed the founding of "a society for the development of the knowledge of the science of education". In the second issue of Mind Croom Robertson printed a short report on the Society. Here it was stated that its aim was to

> examine, systematise and propound definite and verifiable principles upon which the practice of education should be based.[72]

One aspect of the Society's work was to record "all psychological facts having a bearing on education."[73] Several psychologists played a role in the Society - Bain, Ward, Sully were all members, as was Sophie Bryant, a headmistress who also published two important papers on mental tests in the 1880s.[74] Bain was President of the Society in 1880, the year after the publication of his important Education as a Science.[75] The Society provided a forum in which educationalists could meet to exchange views and information and establish themselves on a firmer professional basis. It also provided a convenient niche for psychologists who could treat education as a 'client' discipline, 'selling' themselves

to educationalists in terms of the contribution they could provide in making the study of education 'scientific'.[76] In his introduction to the first issue of Mind Croom Robertson had been careful to draw his audience's attention to the possible practical import of psychology, particularly with regard to education:

> Theoretic psychology has its practical application... in the balanced training and culture of the individual mind ...A true psychology ought unquestionably to admit of being turned to the educator's purpose, and in no direction has the new journal a more decided opening for effective work at the present time.[77]

Later in the same volume Robertson printed a letter from C. H. Lake in response to his remarks. Here Lake sketched out what he saw as the main areas in which psychology could contribute to education.[78] The Society for the Study of the Science of Education was a medium through which psychologists could discuss and communicate their firmly held beliefs about the applicability of psychology to education, but at the same time it can be viewed as an institution which psychologists could use to enhance the interests of their own discipline.[79]

Although there was no formal psychological society in mid-nineteenth century Britain there was a flourishing sub-culture of informal clubs and societies in which the subject was discussed and debated. Much of this activity was an offshoot of the Metaphysical Society which met regularly in the period 1869-80 to discuss what were seen as fundamental issues concerning science, religion and morality. The members of the Society included a large number of the major figures of the Victorian intellectual community including T. H. Huxley, John Lubbock, Cardinal Manning, F. D. Maurice, J. R. Seeley, Alfred Tennyson and John Ruskin. The meetings of the Society often touched upon psychological issues. Indeed, it was initially going to be called the 'Metaphysical and Psychological Society'.[80] Psychologists and philosophers sympathetic to psychology were members of the Society. These included Croom Robertson,

James Sully, Henry Sidgwick, Shadworth Hodgson and J.C. Bucknill.[81] The Society provided a forum in which important and fundamental issues relating to psychology were fought over and ardently discussed. It also played another important role in that it brought together the nucleus of a group of people who began to meet outside of its confines.

In this group one can identify Croom Robertson, Sully, Sidgwick, Hodgson, Bain, James Ward and Sidgwick's close friend and colleague John Venn. Other prominent Victorian intellectuals such as Leslie Stephen were on the fringes of this group.[82] One way in which this group interacted was through the Psychological Club which was founded and organized by Croom Robertson.[83] Sully, Hodgson, Bain and others would meet at Robertson's house for dinner and afterwards discuss psychological issues. In 1886 during his short sojourn in England, the U.S. psychologist J. M. Cattell attended the Club's meetings and wrote that "the best psychologists belong to the Society."[84] Another similar philosophical and psychological club was the 'Scratch Eight' whose members also met for dinner and a discussion. Sully, Hodgson, Robertson, Sophie Bryant, Edmund Gurney, Leslie Stephen, Carveth Read (who later took Robertson's Chair at University College), Francis Pollock, F. W. Maitland and occasionally William James were all members.[85] Yet another informal meeting point was a walking club, the 'Sunday Tramps' which was organized by Leslie Stephen. This was founded in 1879 as an offshoot of the Metaphysical Society and Sully, Robertson, Hodgson and others were members. It was not only a walking club - it was also a social occasion providing an opportunity for enjoyment and discussion.[86] At Cambridge yet another discussion group, the Moral Science Club, organized by Sidgwick and Venn provided a forum for the debate of psychological issues.[87]

One final offshoot from the intense debate generated by the Metaphysical Society was the Aristotelian Society, founded by Shadworth Hodgson in 1879. Hodgson was the first President and held this post for

fourteen years.[88] Although designed to attract those primarily interested in professional philosophy, the society's constitution, bye-laws and method of operation were directly modelled on those of the Metaphysical Society.[89] Prominent psychologists and philosophers were members and in 1886 J.M.Cattell reported that it was

> ...the best philosophical society in England. Bain, Romanes, Hodgson, Ritchie and Alexander, almost the first psychologists in England were five of the seven who read papers last year. [90]

The Society met fortnightly and one or more papers prepared in advance by members were read and discussed. Psychological and methodological questions were prominent in the discussions and in the 1890-91 session the executive committee complained of the comparatively small space given over to "philosophy proper".[91] In 1891 the Society began publishing its Proceedings although prior to and after this a close association with Mind was maintained.[92] The above discussions indicate that although no formal society concerned with psychology existed there was a vigorous and sustained groundswell of interest and discussion of the subject.

The fact that the British Psychological Society was founded in 1901 nine years after its equivalent organization in the U.S. is indicative of the relative institutional weakness of psychology in Britain.[93] The first meeting was held on 24 October 1901 and was attended by ten people at University College, London.[94] Of the founding members three worked at the London County Council Mental Asylum at Claybury (Armstrong Jones, the Medical Superintendent; F.W. Mott, the Pathologist; W.G. Smith, who was in charge of Experimental Psychology). Four were academics (Sully, Professor at University College; McDougall, Lecturer in Experimental Psychology in Sully's department; W.H.R.Rivers, Lecturer in Experimental Psychology at Cambridge; W.R. Boyce Gibson, a lecturer in Logic, psychology and ethics at various London colleges). Sophie Bryant was a headmistress, F.W. Hales, a private tutor and

A. F. Shand, a psychologist of independent means.[95] From its foundation the Society provided an opportunity through its regular meetings for psychologists to present papers and exchange information and ideas. It also served to shape psychologists in Britain into a self-conscious and more coherent professional grouping. For the first 17 years of its existence the Society was characterized by its exclusivity - membership was limited to those who were recognized teachers in some branch of psychology or who had published work of recognized value.[96] The Society not only received support from psychologists but also from physiologists and psychiatrists and the range of papers discussed at its meetings was correspondingly broad. Soon after its inception the Society had become the major forum for debate for British psychologists. At last British psychologists possessed an organization around which their discipline could develop.

Psychologists in the Universities

In the late 1870s William James in the United States and Wilhelm Wundt in Germany helped inaugurate the academic establishment of the new disciplines of experimental psychology by founding laboratories at the universities of Harvard and Leipzig.[97] From these beginnings the discipline expanded steadily in both countries in terms of numbers of practitioners, establishment of psychological laboratories and university departments.[98] In Britain, however, the situation was quite different; it was not until 1897 that the first official psychological laboratory was established in a university. It was not until 1919 that a full time Chair in Psychology was founded in a British university.[99] In 1889 James McKeen Cattell could write to Francis Galton from his psychological laboratory at Philadelphia:

> The outlook for psychology is, I think, more hopeful in America than in England. At this university we have made something of a start. We have good laboratory rooms, and apparatus costing $2000. And what is still more important, we have students, both elementary and advanced.[100]

In contrast rooms, apparatus and funds were in short supply in Britain. The relatively late establishment of experimental psychology in British universities formed part of the wider picture of experimental science in Britain. Until the late 1860s no organized laboratory course was taught anywhere in England even in physics.[101] A particularly striking example of this 'lag' was in physiology, which on the Continent had become an increasingly rigorous and broadly based experimental science. In England, however, it remained subsumed in anatomy and religious and philosophical controversy. Gerald Geison has persuasively argued that the "stagnancy" of English physiology in the period 1850-70 was only a very blatant example of the general stagnancy of experimental science in England as a whole. What permitted rapid developments in Continental science and prevented them in England was the interrelated pattern of the institutionalization of science and the organization of the universities in each country.[102] Generally in Britain the universities saw themselves as teaching institutions rather than, or as well as, centres for the pursuance of fundamental research. Such an attitude was not conducive to the rapid development of experimentally based science. This general pattern also applies to psychology.

The first two psychological laboratories established in Britain were both founded in 1897, in University College London and at Cambridge. The establishment of both involved a struggle over the basic legitimacy of the discipline and the epistemological status of the subject. Also of fundamental importance was the ability of the proponents of the laboratories in both places to marshall powerful supporters from within the university elite to support their case. A comparison of the founding of both laboratories is instructive because it aids an understanding of the establishment of experimental psychology in Britain in general in late Victorian Britain.[103]

In the 1870s Cambridge University was in a state of flux and transition; a spirit of reform was in the air which challenged established institutional aims. Rather than viewing their positions as temporary on the way to a life in the church, college tutors increasingly looked to a full time career in teaching. The holders of College Fellowships increasingly taught or performed other duties in colleges. Members of the Senate became increasingly sympathetic to the sciences and other extensions to the curriculum.[104] It was to this setting that James Ward, a moral sciences graduate from Trinity College and a pupil of Henry Sidgwick, returned from studying and experimenting in physiology at Leipzig. Ward was to become the key figure in a long drawn out drama to establish an official place for psychology in Cambridge.[105] In 1878 Ward began giving informal lectures in psychology at Trinity College. These were the first such lectures at Cambridge and were arranged by Sidgwick.[106] According to a sparsely documented account Ward, in association with the logician John Venn, applied to the University in 1877 and 1879 for a grant to purchase psychophysical apparatus, but they were unsuccessful on both occasions.[107] In November 1886 and in 1888 they made other attempts to found a laboratory, this time with the backing of the Special Board for Moral Science, but again they were refused.[108]

In April 1881 Ward had, with the support of Sidgwick, been made College lecturer in Moral Science.[109] At this time he was giving lecture courses on "Psychology" and "Psychophysics" and from 1883 these were included in the Moral Sciences Tripos.[110] In 1886 Ward was joined in lecturing by G. F. Stout who had just been made a Fellow of St. John's College.[111] This struggle to institute lecturships, courses and examinations accompanied the attempt to found a psychological laboratory. At this time, however, a laboratory was established at Cambridge on an unofficial basis for a short period.

This laboratory resulted from the presence in Cambridge over a two year period of the American psychologist James McKeen Cattell.[112] Cattell found Britain a congenial place to spend time continuing his studies and experiments after completing his Ph.D. with Wundt in Leipzig.[113] With the aid of James Ward and Michael Foster, Cattell had hopes of continuing his experiments begun in Germany in the Cambridge physiological laboratory, but this never occurred. By May 1887 they were hoping to set up their own laboratory.[114] In this they encountered the problems which had faced aspiring experimenters in other subjects at Cambridge:

> I have been busied this afternoon trying to find a place for a psychological laboratory. All the buildings are very crowded. Some of the colleges are rich, but the University itself is poor, and finds it expensive to house the laboratories and museums which have grown so rapidly during the past few years. [115]

Three days later he could report to his parents:

> Yesterday I saw the professor of physics, and have made arrangements to start a laboratory in the building for physics. I shall set up apparatus to do original research, and look after any who wish to study the subject. [116]

The establishment of the laboratory rested on its making no demands on the university and on Cattell using his own apparatus. It also had the support of powerful figures in the university like John Venn and Henry Sidgwick, with the latter donating $900 to support the laboratory.[117] In 1888 J. M. Cattell began lecturing twice a week on psychophysics and with the aid of Ward supervised students in laboratory work at the Cavendish laboratory.[118] This arrangement did not last long for, in early 1889, Cattell returned to the United States taking his apparatus with him and thus forcing the laboratory to be wound up.[119]

In May 1891 another request was made by Sidgwick and Ward to the Moral Sciences Board for a grant to purchase apparatus for a psychological laboratory. This was at last granted and a sum of £50 sanctioned. The apparatus was to be set up in a room in the new physiological laboratory.[120]

In June 1897 Ward was elected to a newly established Chair in Mental Philosophy. This was important since it meant he was a member of the General Board of Studies and could advance the interests of psychology personally. In May of the same year the General Board reported that it was now supporting an application by the Board of Geology and Biology which stated that

> a great need exists for a special course of study in the physiology of the senses adapted for those who are studying psychology as well as those studying physiology.[121]

Consequently the Senate agreed that

> a university lectureship in physiological and experimental psychology...be established for a period of five years, dating from October next, and that the stipend be £50 a year.[122]

W.H.R. Rivers was swiftly appointed to the post. Rivers had in fact joined the staff of the Physiology Department in 1894 as lecturer in the Physiology of the Sense Organs, and on physiological psychology.[123] The psychology laboratory remained in a room in the physiology department for the next few years. Ward continued to press for further financial support and in 1899 appealed for funds for a Reader in Psychophysics and the equipping of an extensive laboratory with a darkroom and rooms for optics, acoustics and haptics.[124] The final establishment of the Cambridge laboratory was only possible through the constant agitation of powerful members of the university such as John Venn, Henry Sidgwick and Michael Foster.[125] Without such pressure it might well have been a substantial period before a similar point was reached in the development of psychology at Cambridge.

Although University College in London had a Chair in Philosophy from 1829 no interest was shown in psychology until 1866 when George Croom Robertson was appointed to the renamed Grote Chair of Mind and Logic.[126] Croom Robertson's duties were extremely broad. He was expected to lecture on philosophy of mind, psychology, logic, ethics and history of philosophy.[127] Although, as I noted earlier, Croom

Robertson was interested in experimental psychology and actively supported the subject through the pages of Mind, he appears to have made no attempt to establish a laboratory in the College.[128] In 1891 Robertson retired from his post because of ill health. The following year James Sully was appointed in his place.

Although Sully was a close friend of many leading psychologists and other respected intellectuals such as Bain, Sidgwick and Leslie Stephen, he had until this time earned his living by reviewing, writing and later by taking a rather lowly lecturing post at the College of Preceptors in London.[129] In the 1880s and 1890s the philosophy department was small and received little encouragement from the regulations made by the university. Sully's classes were not large and tended to diminish as the subject was moved from being compulsory to being optional for arts students.[130]

It was in June 1896 that Sully began to firmly think about setting up a laboratory at University College. No doubt he was influenced by his own interests in educational psychology and by the rapid changes taking place elsewhere in University College. While the rapid growth of the 1860s and 1870s had put a great strain on the College resources in terms of buildings, equipment and personnel, the period 1880-1900 saw many of these problems solved. Problems of space and equipment were at least partly alleviated by an extensive building programme. For example, in 1892 a new Physics laboratory was opened and the following year the South Wing of the college extended to include mechanical and electrical engineering laboratories.[131] The 1890s then, were an era of change, an age of university expansion. In June 1896 Sully put his proposals for a laboratory to Francis Galton, at that time still a powerful and leading figure in the scientific community in London. The following month he wrote to Galton enclosing a draft circular intended to generate support and asking for Galton's help and advice. Sully had already discussed the

matter with powerful members of the university establishment such as W.F.R. Weldon (Professor of Zoology), A.E. Schäfer (Professor of Human Physiology) and also Henry Sidgwick from Cambridge.[132] The project was now delayed while Sully took a summer break and in the autumn he was again writing to Galton, informing him that he soon hoped to have the proposal "for founding a psycho-physical laboratory in a more acceptable form."[133] It was not, however, until early the following year that a formal meeting took place, after Sully had sent out a formal invitation:

> A meeting of an informal character is to be held in the Council rooms of University College on Monday the 15th at half past 4 o'clock, in order to discuss the desirability of establishing a laboratory of experimental psychology under the management of a trained teacher. It is felt by a number of friends of the college that such an institution would greatly add to its efficiency, and would probably attract not merely students of science but those proposing to be teachers and others who would by means of such a laboratory have the opportunity of acquiring familiarity with the methods now carried out in Germany, America and France for measuring sense capacity and the simpler mental processes.[134]

At this stage Sully succeeded in enlisting the support of Karl Pearson (Professor of Applied Mathematics), a close friend of Galton. From now on Sully kept in close contact with Galton, planning the next moves in the campaign with him and drawing upon his vast store of experience in scientific committees and organizations.[135]

With the help of Galton, Schäfer, Pearson and Carey Foster (Professor of Physics), Sully drafted out a letter which he planned to use to raise support.[136] Before this could be done, however, Sully had first to obtain approval from the University Council. On 3 April, 1897 a letter from Sully was read at a Council meeting asking for the Council's approval for a scheme to establish a laboratory for experimental psychology. A motion was passed resolving

> That the Council express their warm approval of the scheme and their readiness to do what they can to carry it out.[137]

The proposer of the motion was R. B. Haldane who was a powerful ally for Sully in his project. Sully was already well acquainted with Haldane even before succeeding to the Grote Chair; both were members of Leslie Stephen's 'Sunday Tramps' walking club.[138] Haldane was an important and influential figure in university politics; from 1896-99 he was Vice-President of the Senate, in 1897-99 Vice-President of the College, and in 1897-99 Vice-President of the Council.[139]

Two days after the Council meeting Sully began distributing a printed circular headed "Proposed Psychological Laboratory at University College London". In this he was aided by other members of the organising committee. This consisted of Galton, Foster, Pearson, Schäfer and W.H.R. Rivers, then lecturer in physiology of the Special Senses at Cambridge.[140] In his circular Sully printed the names of the organizing committee and those of supporters such as the neurologist Hughlings Jackson and R.B. Haldane in an obvious attempt to gain legitimacy. Sully wrote that

> The object of experimental psychology is to investigate and measure those physical and physiological phenomena that are inseparably associated with every mental process. Its study has already supplied a scientific basis to mental science by disclosing unexpected limitations to the speed and comprehensiveness of mental action, by measuring the elementary characteristics of individual minds, and by determing the differences between them.

He went on to claim that experimental psychology could be used to help the mentally defective, and that Britain had fallen behind the U.S. and Germany in the subject.[141]

Sully now faced a problem — where was the money to come from? In giving its approval the University Council had explicitly stated that they supported the project "provided it does not involve any considerable expenditure on the part of the college."[142] Unlike at Cambridge, this attitude did not express hostility to the subject but was simply a product of the college's financial situation in the 1890s. Although the

college received its first parliamentary grant in 1889 and its first London County Council grant in 1894, fee revenues declined. As a consequence a deficit of over £4000 was returned in 1898. Even at the turn of the century the sum available to pay the teaching staff was insufficient and the main concern of the College was to make adequate provision for what they had already achieved rather than extend the scope of its activities.[143] In his circular, therefore, Sully included an appeal for financial support for the laboratory. The first subscriber was Galton who sent Sully a cheque as soon as the Council's official support was gained.[144] The fund was swollen by £25 from Sidgwick, £10 a year for five years from Haldane and £5 a year for three years from A.J. Balfour.[145] Although some 80 appeals were sent out support was slow in coming in:

> I ought to say that the responses to the letter are very few — disappointingly so. The interest in the subject seems to be very limited.[146]

At this time promised donations amounted to £70 and annual subscriptions £16. Sully was still short of the £100 which he regarded as being the minimum amount needed to start the laboratory. Help, however, was at hand.

In late March Sully had received a letter from the German psychologist Hugo Munsterberg offering some of his apparatus because he was emigrating to the United States. The price he was asking - £150 - was thought by Sully to be outwith their reach.[147] By the following month Munsterberg had dropped his price to £90.[148] At this stage Sully sought the opinion of Rivers, who thought that some of the apparatus was not needed and that other items were too complex and specialized. In May, however, Sully decided to acquire the apparatus, by which time Munsterberg's price had dropped to £70. The purchase was only possible through a gift of this sum from a former student of Sully's who was working with Munsterberg.[149] Thus, by May 1897 the laboratory had acquired a firm

basis, hereafter events moved at a brisker pace, with a firm decision to secure the services of Rivers being made. In the July issue of Mind the following notice appeared:

> A laboratory for experimental psychology will be opened in U.C. London in October next. The committee have secured a considerable part of the apparatus collected by Prof. Hugo Munsterberg of Freiberg...Among those who have contributed to the movement are Mr. F. Galton, Prof. H. Sidgwick, Mr. A.J. Balfour, Mr. R.B. Haldane, Sir John Lubbock, Mr. Shadworth Hodgson, and Dr. Savage. It is hoped that the name of George Croom Robertson may in some way be connected with the laboratory.[150]

In the University College Calendar for 1897-98 Rivers is listed as Sully's 'Assistant', giving a special course in experimental psychology "dealing with the physiology and psychology of the senses, and the application of quantitative methods to the study of mental processes."[151] In February 1899 the University Council was finally persuaded by Sully to officially take over the laboratory.[152]

In several ways the establishment of laboratories for experimental psychology at Cambridge and London followed a similar pattern. Neither would have come to fruition had the proposers not received the support of people who were already in a powerful or prominent position within the universities. While in Cambridge Ward relied on financial support from the university, Sully in the much more impoverished surroundings of University College had to actively search out sources of funds. Unlike at Cambridge, however, there does not seem to have been any outright hostility to experimental psychology on the governing body of the University in London -- any apprehensiveness seems to have had a financial basis. Nevertheless, a comparison of both laboratories demonstrates that hostile intellectual climate or not, a hard struggle was necessary in order to establish experimental psychology in British universities.

The spread of laboratories

The period after 1900 saw a growth in the number of university departments and laboratories of experimental psychology. The foundation of all followed a pattern of support being given by people with some degree of power within the university and also after a struggle to combat open hostility to the subject.

An example of the latter is given by the painful and protracted history of attempts to establish experimental psychology at Oxford University. Although Samuel Alexander records having given a course in psychology at Oxford in 1891, it was not until 1898 that an official position was created.[153] In this year Dr. Henry Wilde, an electrical engineer from Manchester and a member of the Royal Society, offered the university a donation to establish a Wilde Readership in Mental Philosophy. The occupant of the post was meant to concentrate on encouraging the subject among the junior members of the university. Wilde also stipulated that the subject had to be treated in a non-experimental manner. This condition posed no conflict for G.F.Stout who occupied the post for the first five years since Stout was no experimentalist. After Stout's departure the post was awarded to William McDougall, then a Reader in Experimental Psychology at University College in London. McDougall's appointment is somewhat surprising since prior to this time he had published a long series of experimental papers on physiological psychology. During his period at Oxford McDougall fought continual battles to be allowed to include an experimental element in the work of his students. In this campaign he was aided by the Professor of Physiology, Francis Gotch, whose support extended to an offer of the use of rooms. This arrangement continued after 1911 when C.S. Sherrington was appointed to Gotch's post. It is recorded that McDougall's corner of the physiology department bore a brass plaque inscribed 'Department of Psychophysics'.[154] In addition to the constraints contained in the

terms of reference of the Readership, McDougall also had to struggle to gain acceptance within the university itself. There were several reasons for this: his abrasive character, his close interest in psychical research and hypnotism and his experimental inclinations. He recalled that:

> I was neither fish, flesh nor fowl. I was neither a scientist nor a philosopher... I fell between two stools. The scientists suspected me of being a metaphysician, and the philosophers regarded me as representing an impossible and non-existent branch of science. Psychology had no recognized place in the curricula and examinations. For some years I was not even a member of the University.[155]

Despite these problems McDougall's period at Oxford was relatively successful and he taught an important group of British psychologists: William Brown, Cyril Burt, J.C. Flugel, and May Smith. In 1903 psychology had been placed on the elective list of special subjects in the final honours school of literae humaniores. McDougall, however, was never really very happy in Oxford and left for what seemed a more promising post in Harvard in 1919.[156]

The first full Chair in Psychology at a British university was established at Manchester in 1919. Psychology, including experimental psychology, had been taught there from the 1890s by the Professor of Philosophy, Samuel Alexander. His lectures closely followed G.F. Stout's textbooks, although experimental work was an important part of the course.[157] Thus, when in 1909 T. H. Pear was appointed to the post of Lecturer in Psychology, there was an already existing tradition of teaching experimental psychology. Further, crucially support came for the establishment of Pear's post from Alexander and the Professor of Medicine.[158]

In Liverpool a similar situation developed to that prevailing at Manchester. Here psychology flourished under the patronage of the physiologist, C.S.Sherrington who began teaching the subject in 1899.[159]

An important aspect of his course was a practical class in which

> each member...carries out under supervision, experiments in the examination of the senses, of adaptation, of judgement, of sense descrimination in space and time, of range of consciousness and attention, of muscular action, of measurement of simple and complex reaction times, association and memory, results of exercise phenomena theory and treatment of fatigue. [160]

Over the next few years psychology became an established subject, with a lecturer being appointed and the subject being an option for the B.Sc. degree. By the time Cyril Burt arrived to take up a lectureship in 1907 the subject was well entrenched with 60 education students, 50 medical students, 12 social science students and about 6 taking psychology full time. After both Burt and Sherrington left in 1913, however, no lecturer in psychology was appointed until 1931. It had only been through the direct support of the latter that the subject had flourished.[161] Other centres for the teaching of psychology were slowly established at Aberdeen, Edinburgh and Reading.[162] Once more resources at these universities were meagre and had to be continually fought over.

At the same time as these developments were taking place, the initial footholds established at Cambridge and London were slowly being strengthened. At University College the department was reorganized with courses being given in logic, ethics, aesthetics, history of philosophy and psychology. The psychology element consisted of a general and advanced course given by Sully and an experimental course by McDougall, who also taught physiological psychology.[163] In 1903 the course was changed with McDougall being appointed as Reader and a separate course in experimental psychology being created.[164] Thus experimental psychology had gained a secure place in the university and its future was assured. The department continued to expand, particularly after Charles Spearman took over as Reader from McDougall in 1907. At Cambridge important developments took place before the first World War. In 1902 C.S. Myers began assisting Rivers on practical courses in

experimental psychology, although his only remuneration was from fees paid. In 1906 he was appointed as University Demonstrator in Psychology. In 1907 after complaints by Rivers that he was overworked he was made lecturer in Physiology of the Senses and Myers lecturer in Experimental Psychology. By this time, however, Rivers' interests were undergoing a decisive change towards anthropology. The following year Myers instituted a campaign for a proper laboratory to be built to replace the damp, ill-ventilated cottage it had been occupying. In 1910 a committee was established, including Myers, Rivers and Ward in order to collect funds for a new laboratory. Almost immediately Myers announced that an anonymous donor had given £3000 for the project. This donor was in fact Myers himself. The new building was opened in 1911. At last psychology had a firm place in the university, psychology being accepted as a subject for the ordinary Cambridge B.A. degree in 1910.[165]

The widespread adoption of experimental psychology as a subject to be taught in British universities was delayed with respect to both Germany and the United States. As the above accounts make clear there were several reasons for this. First, there was the more widespread conservatism of British universities whose curriculum remained narrowly based long after continental universities had expanded into new subject areas, particularly experimental science. In addition to this wider restraining force experimental psychologists had to contend with open hostility to their subject. This is well illustrated in the dogged attempts to gain official recognition for the subject at Oxford and Cambridge. Hostility both from religiously inclined opponents who considered that the human mind could not be put 'on a pair of scales', and from philosophers who believed that psychology was an empty pursuit, had to be continually fought against even towards the first World War.

British psychology on the eve of the First World War

By 1914 British psychology seemed to have achieved a place within the landscape of British academic life. At this time the subject was taught experimentally in about eleven universities and, in addition, it also featured in the curriculum of about the same number of university and college education departments.[166] In some respects the picture seemed bright. This was particularly so in the educational field where Cyril Burt had been appointed to the new post of psychologist to the London County Council.[167] Indeed education was seen by some to be an area in which psychology had much to contribute. In his Presidential Address to the British Association in 1906, which he devoted to the state of British science, E. R. Lankester proclaimed that

> Hereafter, the well ascertained laws of experimental psychology will undoubtedly furnish the necessary scientific basis of the art of education, and psychology will hold the same relation to that art as physiology does to the art of medicine and hygiene.[168]

Psychology was also featuring in the discussion of the relatively new education section of the British Association and educationalists in general were becoming more interested in the subject.[169] In 1913 psychology was given a higher status by being made a separate subsection of the physiology section of the British Association.[170] In other ways, however, the situation for the subject did not seem so hopeful. For example, in 1911 the British Psychological Society Membership was only 79 and it was only as a result of dropping the initial stipulation that members be involved professionally in psychology that expansion occurred.[171]

In this chapter I have sought to dissect the process by which experimental psychology became institutionalized in Britain. The evidence I have presented demonstrates that the analysis of Ben-David and Collins on the origin of experimental psychology is too narrowly focussed. It is quite simply not enough to consider only the availability of academic career opportunities. One also has to take into account the

effect of a cultural climate at times hostile to experimental psychology; the hostility of British universities to new fields of knowledge and the shortage of funds available in the university system which could be devoted to a new subject.

At the same time as its institutional status was transformed over the second half of the nineteenth century, so too were the general features of psychological knowledge. British psychology changed from being primarily introspectionist to holding a firm belief in the role and value of experiment. The chapters which follow pursue the details of some aspects of this story.

Chapter Two

Notes

1. quoted (Hearnshaw: 1969).

2. In this chapter, as in the thesis as a whole, I focus on experimental rather than 'medical' psychology or psychiatry. The two subject areas developed in almost separate ways in nineteenth century Britain, with different personnel, journals and institutions; on the development of psychiatry see the collection of papers in (Scull: 1981).

3. For convenient reviews of some of the literature see (Lemaine et al.: 1976), (Edge, Mulkay: 1976), (Geison: 1981).

4. (Hagstrom: 1965)

5. (Ben-David, Collins: 1966).

6. (Ross: 1967).

7. Some of these issues are discussed in (Rintoul: 1978).

8. See for example (Cardwell: 1972, 64), (Dolby: 1977), (Sokal: 1980, 1-6).

9. (Sokal: 1980, 6-11).

10. See (Ward: 1927), (Sully: 1918), (McDougall: 1930), (Spearman: 1932).

11. (Hearnshaw: 1974b)

12. (Cravens: 1978, 60-69); (Camfield: 1973).

13. see (Dolby: 1977). This study provides a useful comparison of the transmission of physical chemistry and experimental psychology from Germany to the United States.

14. This view has been forcefully put by (Danziger: 1979a).

15. see (Turner: 1974a, b; 1978).

16. For discussions on this theme see (Jacyna: 1981), (Smith: 1970), (Young: 1970, chapters 4, 6). Bain's most important work on this theme was his Senses and the Intellect (1855), Spencer's his Principles of Psychology (1855).

17. (Daston: 1978), (Jacyna: 1980; 1981), (Soffer: 1978, Chapter 6).

18. (Courtney: 1879, 328).

19. (Daston: 1978). Debates over the new psychology also encompassed the question of whether there really could be a science of the mind. For example, in 1876 in the initial volume of Mind, the philosopher J.A.Stewart argued that mental phenomena were not definite enough to be the object of science (Stewart: 1876, 450).

20. (Boring: 1950, Chapter 19).

21. (Hearnshaw: 1964, 120, 168)) has suggested that philosophical resistance to the human sciences retarded the development of psychology. I would go further than this and suggest that these philosophical objections had more fundamental social and cultural roots. Similarly, Hearnshaw's suggestion that the climate of philosophical idealism formed by T.H.Green, F.H.Bradley and others, which was hostile to psychology, also does not go far enough. Their approach can be regarded as a particular response to the cultural crisis engendered by the implications of a naturalistic approach to human beings. On this see (Daston:1978, 198-99), (Soffer: 1978, 149-50).

22. (Sully: 1908; 1918), (Bain: 1893b).

23. (Sully: 1918, 131-33).

24. See (Young: (1969) 1980) for an illuminating discussion of the background and context of these changes.

25. (Bain: 1893b).

26. For accounts of the founding and history of Mind see (Bain: 1893b, 8-9; 1904, 327),(Brown: 1941, 197-203), (Quinton: 1976), (Sorley: 1926). The 1976 volume of the journal contains several papers reviewing its development. On Spencer's involvement see (Duncan: 1908, 173).

27. Mind Vol.10 (1901), prefaratory note headed "The Mind Association".

28. Croom Robertson to Galton 3/10/1879, Galton papers No.152/4.

29. (Sully: 1918, 162-63).

30. (Croom Robertson: 1891, 553).

31. (Bain: 1893b, 9-11).

32. Croom Robertson to Galton 29/1/1876, Galton Collection No. 190.

33. (Croom Robertson: 1883, 3).

34. (Croom Robertson: 1876, 3)

35. ibid. (italics in original)

36. For a general review of Stout's editorship see (Passmore: 1976).

37. Mind Vol.10 (1901), prefaratory note "Mind Association".

38. (E.M., A. Sidgwick: 1906, 512), (Quinton: 1976, 8), "Mind Asssociation" (note 37).

39. (Passmore: 1976). It was not, however, until 1974 that Mind dropped "Psychology" from its title.

40. (Duncan: 1908, 457).

41. A copy of this circular can be found in the Galton Collection No.192, along with a letter from C.S.Myers to Galton asking for his support. The circular has the names of McDougall et al. attached.

42. (Ward, Rivers: 1904, 1).

43. (Hearnshaw: 1974a, 9-10).

44. (Ward, Rivers: 1904, 1).

45. (Edgell: 1947, 118).

46. See Chapter 4 and 5 where they are fully discussed.

47. The editors were here referring to Mind and the Journal of Mental Science. The latter was published by the Medico-Psychological Association, an organization of asylum doctors (Hearnshaw: 1964,25).

48. (Bucknill et al.: 1878, 1).

49. Indeed in the first volume a paper by a German researcher was published, (Obersteiner: 1879).

50. 29/7/1885, repr. in (Sokal: 1980, 187). At this time Cattell was working with Wundt in Leipzig. A few years later the journal published a long review by Cattell of books by Wundt and others (Cattell: 1889).

51. (Sully: 1890).

52. For an argument based upon post 1900 British psychology from this perspective see (Doyle 1979, Chap.2).

53. In general see (Cardwell: 1972), (Macleod: 1972), (Barton: 1976). See (Macleod: 1965) for a case study of the relation of science and government. On British science in the early nineteenth century see (Morrell: 1971). See (Turner: 1980) for a useful discussion of the scientific community in the late nineteenth century as a whole.

54. On the Physiological Society see (Sharpey-Schäfer: 1927).

55. (Croom Robertson: 1876, 3).

56. (Bain: 1886, 387).

57. A "Psychological Society of Great Britain" had, however, been in existence from 1875-80, but this was a spiritualist organization quite separate from mainstream psychology. The Society's Proceedings provide an outline of its activities.

58. (Jacobs: 1886). The psychological and anthropological researches of Jacobs are discussed fully in Chapter 5.

59. ibid, 49-50.

60. (Croom Robertson: 1876, 1).

61. (Croom Robertson: 1883, 1-3).

62. The U.S. psychologist James Cattell also found the neurological society a congenial niche during the two years he spent in Britain in the 1880s, see (Sokal: 1980, 221). Rather surprisingly, psychologists do not appear to have taken much part, or at least not a visible part, in the activities of the Physiological Society. This is surprising in view of the close affinity between the two disciplines and also because Francis Galton was one of the original members of the Society, helping draw up the constitution and later taking a great interest in its work by frequently attending meetings and taking the chair on occasion (Sharpey-Schäfer: 1927, 7-8, 20).

63. (Sully: 1918; 179, 182).

64. quoted (Selleck: 190, 169).

65. ibid.

66. For a discussion see (Doyle: 1979, 27-34).

67. (Armytage: 1965, 156-57).

68. (Doyle: 1979, 27).

69. See (Turner: 1887) for a history.

70. (Caw: 1949, 108).

71. (Turner: 1887, 197).

72. Mind (1876) 300.

73. ibid, 444. C.H. Lake was the Honorary Secretary of the Society.

74. (Selleck: 1967, 150). Bryant's work is discussed in Chapter 4. of this thesis.

75. (Bain: 1904, 352).

76. See (Doyle: 1979, 27-34) for a discussion of psychology and education in these terms.

77. (Croom Robertson: 1876, 4).

78. (Lake: 1876). The breadth of topics covered by Lake's Society is indicated by the fact that he gave a lecture on heredity to the society in 1878 and had a note by Francis Galton printed specially for members; a copy of this is in the Galton Collection No. 271/2.

79. In the 1890s another opportunity arose for psychologists to 'colonise' an educational organization. This decade saw a great rise in interest in the study of children, particularly in the aftermath of the shock results of a committee of the British Medical Association in 1888 to examine the mental condition of children; the Royal Commission on the blind, deaf and dumb (1889); and a Committee of Inquiry of the Charity Organization Society. This led to the establishment of the Childhood Society in 1896 and the British Child Study Association in 1894. James Sully became Vice President of the Society's Council and psychologists such as Lloyd Morgan and C.S. Myers were also members (Caw: 1949); (Stevens: 1906). Sully also published a book entitled Studies of Childhood (1896).

80. (Brown: 1947, 26). For an illuminating discussion of the Metaphysical Society and the intellectual context of its debates see (Young:(1969) 1980, esp. 88-91).

81. Bucknill was one of the most respected and successful psychiatrists in Britain and in 1878 had helped found the neurological journal Brain (Brown: 1947, 143). On Sully's membership, see (Sully: 1918, 201).

82. Information on the formal and informal link between these men can be gleaned from a variety of sources: (Bain: 1893b, 1904), (Sully: 1902; 1908; 1918), (Sidgwick: 1906), (Brown: 1947). For some very interesting insights into the culture of psychology in the 1880s in Britain see the accounts of J.M.Cattell discussed in (Sokal: 1972) and reprinted in (Sokal: 1980). Cattell was an American psychologist who spent two years in Cambridge and London between studying in Germany with Wundt and returning to the U.S.

83. (Sully: 1902).

84. Letter of 19/11/1886 repr. (Sokal: 1980, 236), see also (Sokal: 1980, 250, 282).

85. (Sully: 1918, 221), (Gauld: 1968, 157).

86. (Sully: 1902; 1908).

87. J.M.Cattell attended the Club's meetings and his letters provide an illuminating insight into the meetings, see (Sokal: 1980, esp. 253, 295-96, 310).

88. Hodgson was educated at Rugby and Oxford and appears to have been of independent means. Although working outside university circles he was widely respected among philosophers and was a close friend of William James, see (Davie: 1971), (Sully: 1918, 252-53), (Brown: 1947, 151).

89. (Brown: 1947, 106).

90. quoted (Sokal: 1980, 230).

91. Proc. Arist. Soc. Vol.1 (1891), 134.

92. (Brown: 1947, 248-49).

93. For institutional developments in the U.S. see (Camfield: 1973).

94. For a history of the Society see (Edgell: 1947).

95. See (Kenna: 1961).for biographical accounts. See also (Stout: 1936) for Shand; (Meyer: 1973) on Mott, (Doorly: 1953) on Bryant. At the first meeting Lloyd Morgan, Carveth Read, G.F. Stout, Francis Galton, Samuel Alexander, C.S.Sherrington and others were invited to become members (B.P.S. Minutes 24 October 1901), quoted (Doyle: 1979, 19).

96. (Edgell: 1947, 115).

97. See (Boring: 1950), (Murphy: 1949).

98. For a useful outline of U.S. developments see (Camfield: 1973).

99. This was at Manchester in 1919, although C.S. Myers held a part time professorship at Kings College, London from 1906-09 (Kenna: 1969).

100. Letter from Cattell to Galton 22/10/1889, Galton Collection No.220.

101. (Sviedrys:1970).

102. (Geison: 1978).

103. Although the establishment of the Cambridge laboratory has received detailed attention elsewhere, that in London remains shrouded in mystery, it is not even mentioned by James Sully, its founder, in his autobiography and receives rather brief attention by Flugel in his memoir on psychology at University College, (Sully: 1918), (Flugel: 1954). Hopefully the discussion below will remedy this.

104. (Rothblatt: 1968), (Winstanley: 1947).

105. On Ward see (Campbell: 1927), (Bartlett: 1925).

106. (Crampton: 1978, 54-55); Crampton refers to a note from Ward to Sidgwick in Trinity College archives in which Ward thanks Sidgwick for his help in securing his temporary tutorship, and expresses his hope that Sidgwick's attempt to procure him a lectureship will be successful.

107. (Bartlett: 1937, 97). In his detailed study Crampton notes that he could find no archival evidence to support the story (Crampton: 1978, 57).

108. (Crampton: 1978; 57-59, 72). In late nineteenth century Cambridge lectureships, courses, and the day-to-day functioning of academic work were the province of various Special Boards of Studies. In turn these were responsible to the General Board of Studies which reported direct to the Senate (Winstanley: 1947).

109. (Campbell: 1927, 73).

110. (Crampton: 1978, 56).

111. ibid, 60.

112. (Sokal: 1972, a,b; 1980, Chapter 6).

113. Initially he planned to study physiology with Michael Foster and even perhaps to study for a medical degree. His meeting with James Ward changed these plans; Cattell to his parents 3/2/1887 repr. (Sokal: 1980, 252).

114. (Sokal: 1972a, 145). "They want me to start a psycho-physical laboratory here in the autumn". Letter from Cattell to his parents 30/5/1887 repr. (Sokal: 1980, 263-64).

115. Letter to his parents 5/10/1887 repr. (Sokal: 1980, 146).

116. quoted (Sokal: 1972b, 146). In another letter he recorded that he was working in a corner of J.J. Thomson's laboratory, using his own apparatus from Leipzig, (Sokal: 1980, 283).

117. (Sokal:1972b, 146).

118. ibid, 61.

119. (Sokal: 1972a, 147).

120. (Crampton: 1978, 59).

121. quoted ibid, 64.

122. ditto.

123. (Geison: 1978, 304).

124. (Ward: 1899b,24-25); this "Memorandum on Psychology" was published by the Cambridge University Association, an organization formed to raise funds for university expansion.

125. Sidgwick in particular was held in great esteem. For example, he sat on the 1875 University Syndicate which sought to balance the needs of the different departments, and in 1883 he became a member of the General Board of Studies.

126. (Bellot: 1929, 339-40). For accounts of the development of psychology and philosophy at University College see (Flugel: 1954), (Hicks: 1928).

127. (Hicks: 1928, 473).

128. In his position as editor of Mind he was well aware of developments in Germany. He also pursued some experimental work with Francis Galton in the early 1880s; see Chapter 4.

129. (Sully: 1918, 182).

130. (Bellot: 1929, 388), (Sully: 1918, 235-36).

131. (Bellot: 1929, 376-78).

132. Sully to Galton 7/7/1896, Galton Collection No. 325.

133. Sully to Galton 19/11/1896, Galton Collection No. 325.

134. ibid, 4/3/1897.

135. Sully even asked Galton's advice about details of a proposed leaflet about the laboratory, regarding whether it should be single page, what size, what typeface and so on. The joint nature of the project is particularly evident from Sully's remark that "I have written down as nearly as possible what you dictated to me". Sully to Galton, Galton Collection No. 325, 23/3/1897.

136. Sully to Galton 26/3/1897, 2/4/1897, Galton Collection No. 325.

137. University College Council Minutes, 3/4/1897.

138. (Sully: 1908).

139. (Bellot: 1929, 374).

140. Sully's inexperience in this kind of political manoeuvring was a constant worry to him. He confided his doubts on this matter to Galton:

> Calling on people is rewarding to Haldane, but I am not sure that I should succeed in this kind of work. I feel almost ashamed at putting you to so much trouble on this matter.

Sully to Galton 3/4/1897, Galton Collection No.325. A copy of the printed circular is in the Galton Collection No. 325.

141. ibid, 2.

142. U.C.L. Council Minutes, 3/4/1897.

143. (Bellot: 1929, 376-78, 382).

144. "Thanks for the cheque. I enclose formal acknowledgement", Sully to Galton, 3/4/1897.

145. Sully to Galton, 11/4/1897.

146. Sully to Galton, 27/4/1897.

147. Sully to Galton 26/3/1897.

148. Sully to Galton, 17/4/1897.

149. Sully to Galton, 9/5/1897.

150. (U.C.L. Calendar: 1897-98, 59). Assistants were a new grade of teacher who were in effect private servants of the Professor and paid by him. Their position arose from the fact that as the College became more successful the numbers of students grew, so putting a strain on teaching staff (Bellot: 1929, 376).

152. U.C.L. Council Minutes, 25/2/1899.

153. (Laird: 1939, 14).

154. (Oldfield: 1950, 348-50), (Brown: 1936). Such an action by McDougall well illustrates his brash and arrogant manner.

155. (McDougall: 1930, 207).

156. ibid, 207-08.

157. Alexander was far from being an opponent of the new experimental psychology, having recorded that in the 1880s:

> I gave up the greater part of my leisure.... to studying psychology, and in order to make myself well acquainted of that science, I spent the winter of 1890-91 in Germany, working in the psychological laboratory of Professor Munsterberg at Freiberg. Since that time I have also endeavoured by practical work and study in Physiology and Biology.... to qualify myself for further study in this department of the subject.

quoted (Laird: 1939, 13).

158. (Pear: 1948, 1955).

159. (Hearnshaw: 1974a).

160. Liverpool University Calendar 1900-01 qu. (Hearnshaw: 1974a, 10).

161. ibid, 12.

162. (Knight: 1962), (Milne: 1971), (Drever: 1932, 24), (Wolters: 1948, 184-86).

163. University College Calendar, 1900-01.

164. ibid, 1903-04.

165. (Crampton: 1978, 127-58), (Bartlett: 1937; 1947); (Zangwill: 1962), (Myers: 1932). On Rivers see (Slobodin: 1978), (Langham: 1981), (Leach: 1931), (Myers: 1922).

166. (Doyle: 1979, 10).

167. (Sutherland, Sharp: 1980).

168. (Lankester: 1906, 26).

169. (Collins: 1979),(Sharp, Bray: 1980), (Sutherland, Sharp: 1980).

170. (Myers: 1931, 180-81).

171. (Edgell: 1947, 119-21).

CHAPTER 3

THE MERITOCRATIC IMAGE: INDIVIDUAL DIFFERENCES IN THE WORK OF ALEXANDER BAIN

"The mode of production and productive relationships determine cultural processes in an epochal sense... when we speak of the capitalist mode of production for profit we are indicating at the same time a 'kernal' of characteristic human relationships — of exploitation, domination, and acquisitiveness — which are all inseparable from this mode...within the limits of the epoch there are characteristic tensions and contradictions, which cannot be transcended unless we transcend the epoch itself: there is an economic logic and a moral logic and it is futile to argue as to which to give priority since they are different expressions of the same 'kernal of human relationship.'"

Edward Thompson
('The Long Revolution - II',
New Left Review No. 10, 28-29;
quoted The Poverty of Theory, 120).

In the late 1960s in the United States and to a less visible extent in Britain, one of the longest standing controversies in the biological sciences re-emerged as a public issue. The reappearance of the debate over the relative contribution of heredity and environment to differences in intellectual ability was, to a certain extent, initiated by the now notorious paper of Arthur Jensen.[1] The contours of the controversy are well known. Many 'hereditarians' claimed to be able to demonstrate that individual differences in intelligence were to a great degree of an inherited nature and that a refusal to accept this evidence was the result of political motivation. On the other hand, 'environmentalists' tended to concentrate on questioning the evidence, procedures and techniques upon which their opponents rested their case.[2] The critiques of intelligence testing which emerged from these controversies tended, however, to accept the validity of the basic approach taken by the proponents of testing. More fundamental questions about the legitimacy of their entire programme tended not to be asked.[3] Criticisms generally focussed on, for example, how much social class differences were due to heredity and how much to environment. It will be a central contention of the following two chapters that the construction of a means of measuring individual differences in mental ability involved much more than the mere development of statistical techniques and various kinds of test questions. The creation of mental tests involved 'constructing' human nature in a particular way.[4]

This chapter focusses on the contribution made by Alexander Bain to the development of mental testing. Although Bain is a key figure in the development of the psychology of individual differences his role has been neglected by a historiography which has centred on the contribution of Francis Galton.

From Handloom to University Chair

In 1859, the year that Charles Darwin's Origin was published, there also appeared a bulky psychological treatise entitled The Emotions and the Will. The author of this work was a Scotsman, and a frequent member of London intellectual circles, Alexander Bain. This was Bain's second major work, the first being entitled The Senses and the Intellect (1855). Although neither of these works had the profound impact of Darwin's volume, they remained for some forty years the standard British textbooks of psychology.[5] Bain's place in nineteenth century British psychology has been recognized by several observers; in his A Hundred Years of Psychology J.C. Flugel described Bain as "the author of the first textbook of psychology written in the modern manner;"[6] Gardiner Murphy in his Historical Introduction to Contemporary Psychology took the view that Bain had written the first comprehensive solely psychological textbook.[7] A contemporary comment illustrates the esteem in which Bain was held. In a letter to his parents the American psychologist J. M. Cattell wrote that

> Bain and Wundt are, I suppose, the two greatest psychologists that have ever lived, and perhaps the greatest philosophers now living.[8]

Bain opened a new era in British psychology; his work embodied a synthesis of experimental sensory-motor physiology and association psychology, and he had a lasting influence on later nineteenth century British psychologists. He was also responsible for setting British psychology on a firmer institutional basis since it was largely by means of his energy and financial support that the journal Mind was established in 1876.[9] Although Bain's stature as a psychologist has long been recognized,[10] his contribution to the creation and development of differential psychology has passed almost unnoticed.[11]

Alexander Bain's career as a psychologist is the story of the

rise of a working class boy to the heights of a University professorship.[12] Bain was born into poverty, the son of an Aberdeen weaver with five children. He experienced the arduous childhood of the family of a handloom weaver, for as piece-rates declined the work became more and more exhausting, the result being that weavers and their families had to work for up to fifteen hours a day.[13] Throughout his childhood Bain had to help out at home working at, for example, filling bobbins with yarn for his father's shuttles. He also attended several church schools which provided him with an education consisting of the rudiments of reading, arithmetic, algebra, latin and geometry. During his childhood he also read works such as Bunyan's Pilgrim's Progress. In 1829 he left school for good at the age of eleven in order to find a job. For the next two years he worked as an errand boy and clerk for an auctioneer. At the end of this period, however, he returned to work with his father at the loom, where he was to stay for the next five years. Throughout these long, hard years Bain was also engrossed in a process of self education. Such an activity was common amongst skilled workers and their male children during this period, and Bain's education in many respects follows that of many other aspiring working class youths. His devotion to self education centred on the study of science and mathematics, although he also read widely in philosophy and theology.

Like many others who sought to educate themselves, Bain turned both to private study and, more importantly, to the Mechanics' Institute.[14] Bain learnt a great deal through his attendance of lectures and long hours of study in the library of the Mechanics' Institute after finishing work. By 1835 he had acquired enough knowledge and maturity to begin lecturing at the Institute. It was also during this period that he began to lose his religious beliefs, a process which was to have profound consequences both for his work in psychology and the effect which it had on the course

of his career. During the latter years of his studies at the Mechanics' Institute he was encouraged by a Minister to go on to College and, at the age of 18, succeeded in obtaining a bursary to Marischal College, then still separate from Aberdeen University. Bain did well at College considering his background, coming equal top in the final examinations at the age of 22. These years at college were, however, still a period of hard and difficult personal struggle. In between studying Latin, Greek, Mathematics, Natural History, Natural Philosophy, Natural Theology and Moral Philosophy, he went back to help out at his father's loom during vacations because of a shortage of money, and also found it necessary to do some private tuition. In addition to these commitments, Bain still found time to lecture at the Mechanics' Institute on mathematics and later the 'psychology of the intellect'.[15]

Thus, at the age of 22 Alexander Bain had risen from humble origins to gain the highest honours at University. For the next twenty years, however, he experienced the deepest frustration in continuing his academic career. During this period he remained an involuntary free-lance writer and teacher in London and Scotland. Although he applied for many University chairs he was unsuccessful, his agnosticism being a serious obstacle to an academic appointment. For some three years he also acted as Assistant Secretary to the Metropolitan Sanitary Commission, under Edwin Chadwick, in London. His appointment to this post was due in part to the friendship which had developed between him and John Stuart Mill. Bain had first been introduced to Mill at India House in 1842 by a close friend, and from this time on Bain paid regular visits to London and to Mill. In ensuing years he was to write a biography of Mill and to help him revise his Logic in 1843. During these frequent visits to London Bain was effectively a member of London intellectual circles, meeting G.H.Lewes, the physiologist Sharpey,

Thomas Carlyle, Kay Shuttleworth and W.B. Carpenter. He was also acquainted with other Victorian intellectuals such as Harriet Martineau and Charles Darwin. During these years he completed his monumental psychological treatises The Senses and the Intellect (1855) and The Emotions and the Will (1859).

Bain's somewhat haphazard social and intellectual existence came to an end in 1860. In this year Marischal College merged with the University of Aberdeen and in the process a new Chair of Logic and English was created. Bain applied for and this time gained the post and remained in it until his retirement twenty years later. From 1863-75 he published three manuals of grammar and rhetoric, mainly because of his teaching duties rather than from an intrinsic interest. During these years he taught English grammar, composition and rhetoric, as well as Logic and Mental and Moral philosophy. He also continued his writing, publishing a distillation of his two main works as Mental and Moral Science (1868), primarily as a textbook. In 1870 he published his Logic, based mainly on J.S. Mill's work of the same name and also appended copious notes to a new edition of James Mill's Analysis of the Phenomena of the Human Mind (1829).

Bain finally retired from his Chair in 1880 because of ill health, a problem which had plagued him for some thirty years, and which resulted in frequent vacation visits to hydropathic establishments and country areas. In his retirement he continued to lead an active academic life and became a forceful protagonist of university reform, and was twice elected Rector of Aberdeen University.

Bain's Contribution to British Psychology

In terms of the development of British psychology Alexander Bain was a 'transitional' figure, bridging the mental philosophy of the eighteenth and early nineteenth century with the more experimentally

oriented psychology of the mid to late nineteenth century.[16] Essentially Bain belonged to the associationist school of psychology. In his review of Bain's major works his friend J.S. Mill remarked that Bain's psychology deserved to be taken as "marking the most advanced point which the a posteriori psychology has reached".[17] Bain's work did, however, also mark the beginning of a new era in British psychology and it represented a novel approach within the association psychology. In particular, Bain adopted a thoroughgoing physiological approach to psychology. Nevertheless, it is against the background of English associationist psychology that Bain's work should be considered.

The main figures in the development of association psychology were Hobbes, Locke, Hume, Hartley, Thomas Brown, James Mill, J.S. Mill, Bain, Spencer and G.H. Lewes.[18] The analysis of mind undertaken by the associationists was based upon their adherence to a philosophical empiricism. Beginning with the sensationalism of Hobbes and Locke, this a posteriori psychology sought to demonstrate that all knowledge and all experience could be accounted for by combinations of sensations and perceptions, caused in the first instance by external stimuli. The single principle of explanation which was eventually extended to account for all mental processes was the association of ideas. One can summarise the main tenets of the association psychology as holding that complex ideas are formed from simple ideas through the operation of the laws of association. Although Locke introduced the phrase 'association of ideas' in the sixth edition of his Essay Concerning Human Understanding (1690) he did not utilise the concept in a systematic manner. Such an elaboration was published by David Hartley in his Observations on Man (1749).[19] His systematic psychology drew on the work of, among others, Newton and Locke and while elaborating a complex theory of mental association he also sought to combine this with a minutely detailed hypothesis concerning the corresponding action of the nervous system,

including corpuscular vibrations in the nerves. For Hartley, the sole basis of association was the principle of contiguity in time : sensations or ideas must occur at the same time or in immediate succession in order that one may bring forth the idea of the other.

No great break occurred in the associationist tradition in its development from Locke to Hartley, or from Hartley to the Mills. There was a gradual broadening out of the fundamental concepts and a progressive extension of the analysis. While, however, Hartley had been concerned to prove the validity of associationism, James Mill assumed it and instead applied himself to the task of making the analysis more orderly and far reaching. By Mill's time the main concepts of the theory of mental association were well known to English readers and associationism was one of the dominant schools of philosophy; systems of ethics, aesthetics, jurisprudence, economics, history and theology had either explicitly or implicitly been built up on associationist lines.[20] In Mill's system every experience was viewed as being ultimately resolvable into sensations and ideas combined into groups, or following in trains, by a single process of association. This principle of association took the simplest form - the tendency of ideas to be grouped in the manner of the original experience. In addition, Mill also considered factors affecting the strength of associations. He was not, however, interested in psychology for its own sake and saw the analysis of mental processes as a necessary preliminary to a valid logic, a new (utilitarian) morality and sound pedagogical principles. The relevant context for Mill's psychology is his interest in legislation and education.[21]

In the years following the publication of his major psychological work Analysis of the Phenomena of the Human Mind (1829), James Mill was heavily criticised by Sir William Hamilton and others. In the light of

this criticism Mill's son, John Stuart Mill, amended his father's theory in several respects. The main alteration was a broader conception of the process of association. J. S. Mill argued that there were three laws of association: similarity, contiguity combined with frequency and habit, and intensity (later he modified this to similarity, contiguity, frequency, and intensity). He assigned an important role to attention in connection with voluntary activity; attention, produced by pleasurable or painful experience tends, he argued, to prolong the experience, to strengthen it, and to make it more distinct.

The fundamental innovation in Bain's work was his unity of psychological and physiological analysis. Indeed, Boring has justly commented that Bain's work "represented the culmination of associationism and the beginning of its absorption into physiological psychology."[22] Bain began The Senses and the Intellect (1855) with a long chapter on the brain and nervous system and a detailed account of the sense organs. Similarly, in The Emotions and the Will (1859) Bain stressed the physical basis of emotional experience. Although Hartley, James Mill and Thomas Brown had unquestionably studied physiology, the subject had advanced immensely by Bain's time. He had a firmer basis on which to proceed and relied extensively on standard works such as Quain's Anatomy (1828) and Johannes Muller's Handbuch der Physiologie der Menschen (trans. 1842).[23] His knowledge of physiology was not, however, wholly secondhand, since he had attended Sharpey's lectures on the brain and nervous system at University College, London.[24] A large part of Bain's Senses was devoted to an exposition of his particular version of the laws of association. In the first edition he argued that there were two fundamental laws of association — contiguity in time or place and similarity. He considered that the operation of the mind was, to a great extent, explicable by these laws. As part of his physiological approach Bain emphasized the senses and in this his discussion was

conventional, encompassing five normal senses plus an 'organic' (including 'muscular') sense, this latter one he thought to be most important. Indeed, his use of the concept of muscular sensations was a leading feature of his psychological system and he used it in explaining impressions and judgements concerning external objects.[25] Movement was also a fundamental physiological attribute and came into Bain's work in its own right rather than merely as muscular sensation. Bain was not, however, an extreme or uncompromising associationist; the laws of association did not in his view provide a complete picture of the operation of the mind. He did not believe that all complex mental structures were solely built up from experience and he allowed room for primitive or innate combinations. This is particularly evident in his discussion of the emotions where he considered it necessary to allow a much greater range than other associationists had done to what he regarded as an inherited instinctive basis of human nature. It would also be quite wrong to label Bain's psychology 'introspectionist'; Bain combined reflection with observation, proceeding by what he regarded as the 'Natural History' method.[26] Although he performed no experiments himself he was prepared to allow them in principle believing, for example, that gradations in mental states could be estimated and their durations and rapidity of succession measured. He viewed introspection and experiment as being complementary, although with the former dominant.[27] His psychology did not, however, become a thoroughly quantitative one.

Mental Ability

When Bain came to discuss individual differences in mental ability he fashioned his theories out of existing bodies of knowledge interpreted and utilized in a particular way. One resource was the association psychology which played a large part in his attempt to formulate a technique for grading people according to differences in their 'mental ability'. Another body of knowledge which Bain actively drew upon and

which, as I argue below, shaped his thought to a significant extent, was phrenology. At a more fundamental level Bain's psychology embodied a naturalistic approach to the study of the phenomena of the human mind. His thought stands at the confluence of several intellectual currents which R. M. Young has identified as being at the centre of the nineteenth century debate on the place of humans in the natural world.[28] The growth of naturalistic approaches to the earth, to life, and to humans, as for example, expressed in Chamber's Vestiges, was manifested in utilitarian theory, phrenology and the association psychology, all of which Bain had close familiarity.

It is evident from Bain's published works that he was deeply interested in individual differences for much of his career. In order to understand fully his theories on this subject, and to account for their form and very existence, not only involves a consideration of his published work but also the social context of its production. At its very foundation the science of individual differences in mental ability was not 'value free'. Basically, my argument is that the image of human nature embodied in Bain's writings on individual differences represented, at a general level, a naturalization of the increasing division of labour which had been occurring since the late eighteenth century. In a narrower focus, Bain's work was also a product of his place in the changing social structure of Victorian Britain, in which the traditional social hierarchies were breaking down and new social interests and sources of power emerging.

For a large part of his life Bain maintained an interest in individual differences in mental ability. His consideration of what lay behind mental differences was closely integrated with his general approach to the phenomena of mind. In his works Bain displayed an acceptance of a threefold characterization of the mind in terms of cognitive (knowing), affective (feeling) and conative (willing) aspects, which originally

derived from Kant.[29] Elsewhere he referred to these as Intellect, Emotion and Volition.[30] His commitment to this perspective led him to modify the existing tradition of association psychology and argue that humans did not act solely on the basis of sensory impulses received by the brain, but that the mind, through the medium of the brain, was a self acting instrument — human beings possessed a Will.[31] Similarly he did not accept the Utilitarian view that pleasure and pain were the sole determinants of behaviour but held that it resulted from a variety of experienced emotions.[32]

In the Senses and the Intellect and later works Bain analysed the structure of the mind in detail. He argued that the Intellect was comprised of three functions: Discrimination, Agreement and Retentiveness.[33] Of these the Discriminative function was, he argued, the most fundamental:

> Mind starts from discrimination. The consciousness of difference is the beginning of every intellectual exercise. To encounter a new impression is to be aware of change: if the heat of a room is raised by 10 degrees, we are awakened to the circumstances by a change of feeling, if we have no change of feeling, no altered consciousness, the outward fact is lost upon us...our intelligence is therefore absolutely limited by our power of discrimination. The other functions of intellect, the retentive power, for example, are not called into play until we have first discriminated a number of things... the blank of sensation is a blank of memory.
>
> Yet further, the minuteness or delicacy of the feeling of difference is the measure of the variety and multitude of our primary impressions.[34]

In putting forward this conception of Discrimination as the fundamental attribute of the Intellect Bain utilized the sensationalist theory of association psychology. This particular development was, however, a new departure. Bain regarded this point as being so fundamental that he argued that consciousness was the same thing as sensory discrimination and that knowledge was virtually synonymous with consciousness.[35]

It was at this point in his psychological system that Bain brought

in a conception of individual differences in mental ability; he continues the above passage by arguing that

> we have by nature a certain power of discrimination in each department of our sensibility. We can from the outset discriminate, more or less delicately, sights, sounds, touches, smells, tastes, and in each sense some persons much more than others. This is the deepest foundation of any disparity in intellectual character, as well as a variety of likings and pursuits. If, from the beginning one man can interpolate five shades of discrimination of colour where another can but feel one transition, the careers of the two men are foreshadowed and will be widely apart. To observe this native inequality is important in predestining the child to this or that line of special training.[36]

This clear and forceful statement of the existence and reason for individual mental differences could almost by itself serve as firm evidence that Francis Galton was neither the first, nor the only Victorian psychologist to construct a theory of mental ability. Bain developed an image of human nature according to which people possessed more, or less, of an innate mental capacity. He argued that a person's intelligence was absolutely limited by their access to the sensory world, and hence the more sensory information a person could receive, the greater aptitude they would possess in activities associated with that sense.

Bain first discusses individual differences at any length in the first edition of his Senses and the Intellect (1855). Within this work, in a long chapter on the nervous system, Bain placed a discussion of what he termed 'muscular discrimination'. As an example of muscular discrimination Bain presented a discussion of discrimination of differences in weights.[37] He argued that with respect to the judgement of weight differences

> there would appear to be wide constitutional differences, and also differences resulting from practice, among different individuals. We are all sensitive to some extent, but there is for each person a degree of minuteness of addition or subtraction that ceases to be felt.[38]

For some years before Bain wrote this, detailed experiments concerning

sensory discrimination, including weight judgement, were being undertaken in Germany. For example, pre-dating Bain's discussion were the classic experiments of E. H. Weber (1795-1878) on the ability to discriminate differences between a pair of weights.[39] Weber and other researchers in Germany were, however, more concerned with how a knowledge of the phenomena of sensory discrimination could contribute to the picture which they were developing of the 'laws of the mind' than they were with the social implications of their work. In contrast, Bain clearly stressed the existence of variations in sensory discrimination and clearly considered that such differences had profound social implications.

In his writings Bain not only discussed the existence of differences in mental ability he also, even from an early stage of the development of his theories, formulated the question of what the sources of such differences were. Bain argued that individual differences were the product of both hereditary structure and the individual's experience of the world. He pressed forward the view that with respect to all three realms of the mind — Emotion, Volition and Intellect — there was a certain 'primordial structure' which was the foundation of all that a human being ever becomes and that experience was laid on top of this basic structure.[40] Four years later, we find him arguing that there exists a "certain primary quality of constitution" which underlies discrimination.[41] In this work, The Emotions and the Will, Bain amplified and extended his conception of individual differences in mental ability:

> In whatever department of impressions the nicest sensibility of difference prevails, in that department will reside, in all probability, the intellectual aptitude of the individual. It may be in the delicate appreciation of degrees of muscular force, giving birth to dexterity of manual or other bodily exertion; it may be in taste or smell, so as to confer an aptitude for testing substances that affect those senses; it may be tactile and contribute to the discrimination of solid substances from the texture of their surfaces, it may lie in some one or other of the properties of sounds, musical or

> articulate, or finally, in the wide domain of vision. To be markedly sensitive to very minute shades of difference, or to have a distinctive consciousness under a very slight shock of change is the first property of the intellect.... We cannot assign any fact more fundamental in the constitution of our intelligence. The laws of association, and the storing up and engraining of various impressions, imagery and ideas, presuppose the primitive susceptibility to every various mode or degree of primary sensations or feelings.[42]

It is evident from Bain's discussion that he had become considerably interested in this approach to conceptualizing individual differences in mental ability; it is also clear how fundamentally his theory was framed within the terms of association psychology.

It was, however, in his book On the Study of Character (1861) that Bain presented his most extensive discussion of individual differences, arguing for example, that

> to be struck by the difference of two successive states of mind is to be intellectually alive; and one man conscious of a difference not recognized by another is to that extent the more intellectual of the two.[43]

In this work he discusses mental differences between people and races, and the nature of 'talent' and 'genius'.[44] This formed part of his larger aim in this work of more or less following the programme which had been proposed by his close friend John Stuart Mill — to deduce the laws of character from the laws of mind. In the second volume of his Logic, Mill had proposed the establishment of two distinct sciences of the human mind: psychology, which was to investigate the general or universal laws of the mind, and a more subordinate subject having to do with the way these laws, operating in specific circumstances, gave rise to individual human character. The latter subject he termed Ethology, a "science of the formation of character".[45] In his book Bain sought to demonstrate that a true science of character could be deduced from the laws of association, the pleasure-pain principle, and primitive mental elements. Here, too, Bain argued that both experience and a person's inherent 'constitution' contributed to their ability to discriminate sensory differences and hence to their intellectual ability.[46]

Finally, Bain pressed his psychology of the intellect into more practical service in his writings on education. In 1879 Bain published in several parts in his journal Mind, then in book form, a volume entitled Education as a Science.[47] The publication of this work reflected Bain's deep interest in education and the cause of educational reform.[48] His consideration of the educational process was based upon his psychological system. He argued that the most important point to be taken into account for the success of education was the 'plastic property' of the mind and that the main aim of education must be to strengthen the memory.[49] Bain devoted a long chapter of this work to a discussion of the "Bearings of Psychology" on education, arguing that education must improve the pupils' discriminative ability.[50] He considered that the key to education was memory, or as he termed it, the 'retentive faculty'. He argued that this faculty and the plastic property of the mind which enabled the faculty to be strengthened, were of the greatest importance to education.[51] Bain's discussion of the physiological mechanism of retention draws heavily on Herbert Spencer's Principles of Psychology, arguing as he does that the process of retention involves the 'fixing' of an impression over a period of time; that several repetitions are necessary; and that it consists of a series of mental growths involving the establishing of 'beaten tracks' in the brain.[52] In a similar way to his argument about sensory discrimination, Bain argued that individual differences existed in memory. Indeed, he argued that both were fundamentally linked:

> The more mental force we can throw into the act of noting a difference, the better is that difference felt, and the better it is impressed. The same act that favours discrimination, favours retention...No law of the intellect appears to be more certain than the law that connects our discriminative power with our retentive power. In whatever class of subjects our discrimination is great — colours, forms, tones, tastes — in that class our retention is great.[53]

I have argued that Bain gave deep and sustained attention to

individual differences in mental ability. The body of knowledge which he utilized to formulate a means of quantifying and conceptualizing mental differences was association psychology. It is also clear that he gave consideration to whether such differences were due to environment or heredity and stressed that education must be built upon a foundation which recognized inherent individual differences. Bain's development of this image of human nature and these theories did not, however, take place within a social and political vacuum.

Bain, Liberalism and the Division of Labour

Alexander Bain's image of human nature, embodying a theorising of individual intellectual differences, was fundamentally a product of the emergent industrial society in which he lived. I argue below that at a general level Bain's conceptualization of individual differences was part of a wider concern in mid-Victorian Britain about the developing division of labour and other social changes which were taking place, particularly the increasingly visible class stratification. Secondly, at a more specific level, I analyse Bain's psychological writings in relation to his social and political commitments.

To explain the way in which Bain's writings on individual psychological differences were constituted we must first understand certain facets of that complex intellectual edifice termed Victorian Liberalism and of the development of British society during the first half of the nineteenth century.

To middle class Victorians the decades before the mid-nineteenth century were characterized as an age of transition. Indeed in 1831 J. S. Mill voiced the opinion that transition was the leading characteristic of the time, and that "mankind have outgrown old institutions and old doctrines, and have not yet acquired new ones."[54] With the passage of the Catholic Emancipation Bill, the attacks on the church by Whig

liberals and Benthamite agnostics, together with the reform agitation, many middle class observers felt that their society had broken free from the old age of Christian orthodoxy under the rule of church, and civil government under the rule of king and nobility, and that the old social structure of 'fixed' classes each with its recognized rights and duties was being split asunder. The bankers and manufacturers who began to achieve a measure of political power through the far-reaching legislation of the late 1820s and early 1830s — the repeal of the Test and Corporation Acts, the Municipal Reform Acts, and the Reform Bill — owed their victory to the power which they had begun to acquire from the social economic changes which had been taking place throughout the industrial revolution.[55]

To articulate the creed of Reason, Progress and Freedom was the self appointed mission of liberal thinkers. The political and intellectual edifice of liberalism was claimed by its proponents to be founded upon the principle of 'Reason'.[56] Liberals saw a fundamental conflict between reason and freedom (the forces of progress) and authority and superstition (the opponents of progress). To many the most powerful enemy of progress in Victorian Britain was dogmatic theology and the institutions in which it was established — hence their continued and vociferous attacks on the power of the church.[57]

Another aspect of the liberal frame of mind was that there existed a fundamental gulf between the rulers and the ruled. It was as a force in bridging this gap that J. S. Mill and others conceived their prime role in society. They typically supported the interests of upwardly mobile industrial capitalists against the more conservative views of the landed aristocracy. Their consequent rejection of static views of society went hand in hand with a wide range of reforming policies directed towards the realignment of political and industrial life.[58]

They believed that an educated person would be able to judge opposing arguments, that he would neither knowingly pursue selfish interests nor unconsciously twist arguments to serve these interests.[59] The prime instrument in moulding a cohesive society was in the eyes of many liberals the ballot box. Universal suffrage and franchise reform would, they argued, help heal societal divisions by giving everyone a voice. Parliament was to legislate, the central organs of government were to direct, and the reformed institutions of local government were to execute, the will of the people. The period of the 1840s saw the triumph of this view, with the emergence of a new state philosophy embodied in the Factory Act and the Public Health Acts.[60]

The most fundamental change which occurred in the class structure of nineteenth century Britain was the creation of a professional middle class. The ideal vision of society espoused by J. S. Mill and other members of the new professional class was based upon expertise and the ordering of society according to merit. Training and expertise rather than property or capital should be the determinant and justification of power and status in society. Similarly, selection by merit rather than by patronage ought to be the universal principle for recruitment to government and other posts.[61] Mill and other Liberal-professionals considered that an educated minority such as themselves could reform society by enlightening the majority, who remained in a state of ignorance. Through agitation for franchise reform, local government reorganization, education and so on, the new professionals sought to wrest some measure of power from the landed aristocracy and establish in its place a learned or intellectual aristocracy. Their social and political frame of mind encompassed a commitment to a conception of society in which social divisions were based upon merit rather than birth. Thus in 1859 J. S. Mill advocated the establishment of a form of meritocracy, arguing that some means had to be found

> by which the more intrinsically valuable member of society, the one who is more capable, more competent for the general affairs of life, and possesses more of the knowledge applicable to the affairs of the community, should as far as practicable, be singled out, and allowed a superiority of influence proportional to his higher qualifications.[62]

To this end he advocated a 'plurality of votes' system of franchise reform in which the unskilled labourer had one vote; the skilled two votes; foremen three votes; lawyers, clergymen and physicians five or six votes; the university graduate five or six votes. He further argued that a system of voluntary examinations should be established to which anyone could present themselves and obtain a certificate stating the number of votes to which they were entitled.[63]

Throughout most of his life Bain adhered to the outlook of Victorian liberalism. He records in his autobiography that in the summer of 1831, just after he had returned to work at his father's loom, he became caught up in the intense agitation then occurring over the Reform Bill, and attended many public demonstrations. It was at this time that he gained a commitment to Reform, which in the shape of Liberalism, stayed with him throughout his life.[64] Bain did not, however, set out to construct for himself a political career, although his stature as a respected figurehead of the Liberal creed was emphasized by the invitation of Radicals in Sheffield to stand as a parliamentary candidate in 1885, although Bain declined because of age and ill health.[65] Bain's long association with J. S. Mill, one of the leading spokesmen of Liberalism, also testifies to his political affiliations.[66]

From the time of his youth, when he lost his religious faith, Bain was a fervent opponent of the power of the church and earnestly sought, in the company of other liberals, radicals and nonconformists the separation of Church and State, particularly in the area of education.[67] Bain's decision to stand for election to the School Board in Aberdeen in 1873 formed part of his struggle against the power of the established

church, and when he was elected he was the only one of six 'secular' candidates to be adopted.[68] During his last years as Professor at Aberdeen, and also in his retirement, Bain was deeply involved in the struggle to abolish religious tests in the University, an enterprise which succeeded in 1886.[69]

Bain also shared with his close friend J. S. Mill and other liberal professionals the conviction that British society lay in urgent need of reform. In the 1840s he was deeply involved with the agitation for reform of Public Health in London, at this time holding the position of Assistant Secretary to Chadwick's Sanitary Commission.[70] Such a programme of health and municipal reform was an integral part of the liberal call for social reform as a whole. Bain also shared the liberal concern that society should be reformed in such a way that merit and not birth determined a person's station in life. Part of the reform programme which liberals put forward was the reform of the franchise. In his Considerations on Representative Government (1861), Mill repeated the arguments which he had made two years earlier with respect to franchise reform. He forcefully argued for an extension of the suffrage — but only to those who possessed the rudiments of reading, writing, and arithmetic. In this work he considered the question of whether every person should have the same say in choosing their parliamentary representative, arguing that

> though everyone ought to have a voice - that everyone should have an equal voice is a totally different proposition.[71]

While he accepted the argument that property provided some criteria of education and ability he retorted that accident rather than merit had much more to do with enabling people to achieve prominent positions at the present time,[72] and that

> The only thing which can justify reckoning one person's opinion as equivalent to more than one, is individual mental superiority; and what is wanted is some approximate means of ascertaining that.[73]

For Bain, as for Mill, the vision of a new society required that one had a means of judging what role in society a person was fit to play. In Bain's view the 'Science of Character' would be able to provide such a means of placing each person in their rightful place, in order that a new more just and more efficient society be attained. In the Preface to his Study of Character (1861) Bain boldly proclaimed that

> There is nothing more certain than that the discriminating knowledge of individual character is a primary condition of much of the social improvement that the present age is panting for. The getting the right man into the right place is mainly a problem of the judgement of character, the mere wish to promote the fitting person is nugatory in the absence of the discrimination.[74]

He further stated that it was his wish that a portion of the nation's scientific effort be devoted to this subject, since it was no less important to human welfare than mechanics, geology, or astronomy.[75] It is important, however, to appreciate the points of difference between Mill and Bain. Throughout his life Mill was possessed with the idea that individual and national differences in character were due to accidents of birth that could possibly be controlled — on this he rested his chief hope for the future.[76] On the other hand, Bain inclined to the view that people possessed a certain inherited constitution which was overlaid by experience and education.

By the period in which Bain had begun to formulate his ideas about mental ability an extensive division of labour already existed in British society. The fundamental organizing principles of the factory had become widely established during the closing decades of the eighteenth century and by the early nineteenth century the detailed division of labour was well entrenched in hand loom weaving, glass and paper factories, machine works and foundries.[77] These decades also saw the publication of Babbage's On the Economy of Machinery and Manufactures (1835). This was an extremely popular text in which Babbage endlessly

advocated the introduction of a detailed division of labour and laid out the numerous advantages which could accrue to the factory owner through its use.[78] These changes generated intense interest on the part of the industrial middle class. A 'cult of progress' was engendered: scientific and technological advance was visible and could even be presented statistically, industrial progress and development was indisputable.[79] Alongside these industrial changes there was also an ideological transformation. The ideal citizen of the industrial middle class was the entrepreneur and they firmly held the belief that anyone who was prepared to work hard, whatever their social origins, could get ahead and climb the ladder of entrepreneurial society. It was of course in Samuel Smiles' Self Help (1859) in which this view reached its apotheosis.[80]

The development of a division of labour within factories was paralleled by a change in the social structure of British society. It was as part of the process of the increased specialization of productive functions that a professional middle class came into being.[81] For these new professionals the social and economic changes through which Britain was passing carried a meaning different to that which it had for the industrial middle class. They developed particular perceptions of the existing structure of society, how it should be organized and their own particular place within it.[82] Their ideal society was one based upon merit rather than property, capital, or labour. They took for granted the existence and need for a division of labour and a hierarchical social structure; what concerned them was that people attained their proper place within society.

Alexander Bain and J. S. Mill can be viewed as members of a new intelligensia which came into being as part of the process of the creation of a professional middle class. Both took for granted the division of labour and were concerned that people should find their proper place in

it according to their abilities. For example, Mill wrote that the most important distinguishing feature of modern society was that people were no longer born into a fixed place in the social structure, but could employ their abilities to achieve what seemed to them to be the most desirable role and what they were best suited for.[83]

In his psychological writings Bain explicitly argued that by the fact of their 'constitution' people were fitted to play diverse roles in the division of labour. In his On the Study of Character (1861) he argued that different occupations required differing 'discriminative capacities'; for example, a boy

> might be tested for business or put through a competitive examination by being asked the price of a great number of things that he may have himself bought, or seen others buy...and the places where they were obtained. If this kind of information is found to cling to him by nature and before he has any special motive of application, he has the true bent for the trade.[84]

In other words, Bain is suggesting a memory test as a means of 'sorting' out people suitable for particular occupations. The division of labour already existed, Bain felt it necessary to try and provide an explanation for it and to provide a means whereby it would be possible to put the right person in the right job. He believed that a 'science of character' would be of immense societal importance because of the possibility that through its use people could be classified according to their mental ability. Bain's close friend J. S. Mill voiced similar sentiments, arguing that

> Of all the difficulties which impede the progress of thought, and the formation of well grounded opinions on life and social arrangement, the greatest is now the unspeakable ignorance and inattention of mankind in respect to the influences which form human character.[85]

The views expressed by Bain and Mill were products of their social position in Victorian Britain. Bain even more explicitly talked of the connection of individual differences and the division of labour:

> The active temperament is a good instrumentality in general industry, and especially in dull routine where we want the continuity and persistence of a machine, we do well to procure people of this quality who, after the requisite training, will consent, better than any other, to become mere prime movers in a narrow circle. A fair quantity of intelligence and a large share of activity renders the Anglo-Saxon race the best workmen in the world. As bodily activity predominates in them they are more fit for the lower walks of manual industry, the Lancashire and Yorkshire navvies are unrivalled as human machines. A good share of the spontaneous promptings is of importance in all departments of trade, and in the active professions of Politics, Law, Medicine, and even the Church.[86]

Part of the world view of the new intellectual and social grouping of which Bain and Mill formed a part, was that social differentiation was in the natural order of the world. The aspects of Bain's work which I have discussed here amount to a naturalization of the division of labour. 'Nature' was pressed into the service of a new system of social and economic relations which served the interests of one social group rather than another.

In the company of J. S. Mill and others, Alexander Bain also firmly supported the relatively new idea of the introduction of competitive examinations in order to abolish patronage and promote the rise of competent people to positions in society which fitted their abilities.[87] The growth of competitive examinations dates from the 1840s, when the first nationwide state examination was established for school teachers in 1846.[88] Public examinations were one of the great 'discoveries' of the middle class; from being almost unknown at the beginning of the century they rapidly became a major tool of social policy and were used to recruit men for government service, select ablest students for university, control the work of secondary schools, and used by the state to regulate grants to elementary schools.[89] It was, however, the reform of the Indian Civil Service after 1853 by the introduction of competitive examinations for entry, and the publication of the Northcote-Trevelyn Report on the Home Civil Service, that most fired the imagination of

Liberal meritocratic reformers.[90] Indeed, Mill claimed that "throwing open the civil service to competition was one of the greatest improvements in public affairs ever proposed by a government."[91] Bain was integrally involved in the competitive examinations for the Indian Civil Service. He was Examiner for Moral Science for the periods 1858-60. 1863-64, 1868, 1870.[92] He maintained an interest in the civil service examinations for a considerable period of time, giving a long paper to the Social Science Congress in 1877 on the merits and defects of competitive examinations in the Civil Service.[93] This involvement in, and support for, competitive examinations formed part of the meritocratic social philosophy espoused by Bain. His commitment to competitive examinations, social reform, and a science of individual differences were a part of the same fabric and a product of mid-Victorian society and his place within it.

Phrenology and Individual Differences

Another manifestation of Bain's social and political commitments and an expression of his belief in the existence of innate individual mental differences is to be found in his interest in phrenology. Until recently it was commonplace for historians to regard phrenology either as a passing 'fad' which was the preoccupation of quacks or charlatans, or as a 'pseudo-science'. In recent years, however, some historians have sought to probe deeper than such whiggish judgements and consider phrenology as an integral part of the cultural heritage of science. The picture which has emerged is that in the early Victorian period phrenology represented a widespread movement affecting science, philosophy, education, religion and politics.[94]

Phrenology was largely the creation of two German physicians, Franz Joseph Gall (1758-1828) and Johann Caspar Spurzheim (1776-1832). Gall began to formulate his theories in the 1770s and gave his first lectures on the subject in 1796 in Vienna. Around the turn of the century

Spurzheim became a convert to Gall's phrenological system and subsequently they worked closely together until 1813, when they irrevocably separated. Spurzheim was responsible for introducing a great number of people in Britain to phrenology during his very successful lecture tours of 1814 and 1815, although the subject had received criticism in the periodical press prior to this. It was through hearing Spurzheim lecture and meeting him personally, that George Combe, the most important British phrenologist, became a convert to the theory.

The technique used by phrenologists was to compare and correlate structural differences of the skull and brain with observed variations of, for examples, intelligence and psychological propensities, without the use of surgical experiment.[95] The theoretical assumptions underlying phrenology remained more or less constant throughout the period of its popularity. These were succinctly expressed by George Combe:

> that the brain is the organ of the mind; that the brain is an aggregate of several parts, each subserving a distinct mental faculty; and that the size of the cerebral organ is, ceteris paribus, an index of power or energy of function.[96]

In contrast to the traditional philosophical approach which treated mind as a separate ontological entity to be investigated by the introspective analysis of consciousness, the phrenologists offered an alternative. They categorically stated that there was a one to one correspondence between mind and brain and that human intellectual, moral, and emotional differences were rooted in the structure of the central nervous system. Gall and Spurzheim were, however, ambiguous about the exact nature of the relationship between mind and brain, and this ambiguity continued to beguile phrenology, enabling some to claim it was materialistic, dualistic, or atheistic and others that it posed no problems whatever for established religion.

In basing their system on a faculty psychology Gall, Spurzheim and other phrenologists were following a long established tradition such

as the work of British empiricist philosophers like Sir William Hamilton. Gall, however, went further in developing the concept of a mental faculty and increased the number of such faculties, deciding that there were twenty-seven although most later phrenologists followed Spurzheim and Combe's thirty five.[97] Gall assumed that the faculties were localized in different regions of the brain, that they were 'contained' in the outer portions of grey matter and finally, that the structure of the brain determined the shape of the overlying skull. The phrenological assumption that the size of the brain was a measure of its power of function was a common one in natural history and theories relating to it underwent considerable elaboration during the eighteenth and nineteenth centuries.[98] Although phrenologists assumed that all humans were born with the same number of faculties, they considered that there was ample evidence that, for example, Europeans generally had more highly developed intellectual faculties then other races and that sexual differences in intellect were based upon differences in the power of faculties.[99]

As a body of scientific knowledge phrenology embodied a particular social philosophy, a particular system of values. The professed malleability of the faculties and their potential for improvement firmly linked phrenology to the Victorian ethic of progress and self-improvement. Eminent Victorians such as Herbert Spencer, Alfred Russel Wallace and Harriet Martineau, who at various times aligned themselves with phrenological doctrines, formed only the more visible members of a phrenological 'movement'. There were thousands of members of phrenological societies scattered throughout Britain who dedicated themselves to the new science with considerable enthusiasm. Several historians have recently persuasively argued that to a great extent the membership of these societies were drawn primarily from the rising middle class.[100] In contrast to opponents of phrenology, its supporters occupied relatively

marginal social positions with less status and power in established institutions. Although the phrenological societies were at the heart of the 'movement' there was also a great deal of interest shown outside. The enthusiasm for phrenology impressed itself on artisans, clerks and shopkeepers. To a great extent they learned of phrenology in the Mechanics' Institutes and from a flood of cheap pamphlets which dealt with the subject. Their interest in phrenology stemmed primarily from its potential practical use.[101] Phrenology provided entertainment; a means of interpreting the vast social changes taking place in early nineteenth century Britain; it was a means of self improvement; it assured ordinary people that their weaknesses were not their own fault; it could support a democratic political philosophy — all people were born equal and individual differences arose because each person's faculties were differently developed.[102] Phrenological doctrines were welcomed by, for example, socialists because it offered an alternative to religion as a means of explaining the world. On the other hand, phrenology also served the needs of reformers who advocated the change of educational and penal institutions and insane asylums because it claimed to be able both to diagnose exceptional talents and deficiencies, and show the way to their improvement.[103]

Phrenology emphasized the particularity of human nature rather than its homogeneity; individuals were viewed as being endowed with different talents and deficiencies which made them inherently unequal and society unalterably stratified. Phrenology also embodied a 'moderate' hereditarian conception of human nature and phrenologists followed Gall in abandoning a wholehearted environmentalism.[104] In 1815 Spurzheim explicitly rejected as inadequate the traditional explanation of physical, mental, and cultural racial differences in terms of climate, diet, and way of life.[105] Phrenologists held that innate rather than accidentally acquired characteristics were the key to an understanding of human nature,

and that education, culture and habit could only be effective within the limits determined by a person's original biological endowment — notably the brain. Although an individual's faculties were plain for all to see and could not be altered, a change in behaviour could be effected by education, by the process of self improvement. Innate capacities were seen as placing a limit on potential development.

Phrenologists did not, however, automatically relate intellectual ability to the total size of the brain; what really mattered in their view was the relative size of the various organs which made up the brain. It was held that these individual organs did not all develop at the same time or to the same degree, and that this was the prime reason for the differences between people. Phrenologists undertook to ascertain what natural or inherent powers an individual possessed, which in suitable circumstances could manifest themselves.[106] The phrenological view that all people (except 'idiots') had the same number of faculties, was a source of deep significance to those in self consciously marginal social positions. To those people the phrenological doctrine emphasized that power in society should rest with those who possessed superiority in brain. Phrenology as a science of character was inherently meritocratic; every person was seen as having their proper place in the natural order: the mental superiority of middle class males, the special roles to which women were fitted, the duties of workers, the degree of civilization of other races, could be spelt out, rationalized and reinforced through the means of differences in mental faculties. One of the most fundamental features of phrenology was its naturalization of perceived individual differences in ability, it was in part a rationalization of the social structure of early Victorian Britain.[107]

Alexander Bain's association with the doctrines of phrenology was close and his acquaintance with its teachings helped shape his thought. Like many phrenologists he came from an upper working class

background and was socially upwardly mobile. It was through his contact with phrenology that Bain first developed his ideas concerning individual differences in mental ability and his writings embody many phrenological assumptions.[108] Bain's acquaintance with phrenology began,as it did for many other people of his social background, in his local Mechanics' Institute. Throughout the period of its greatest popularity Mechanics' Institutes had been at the centre of the stimulation of interest in the subject.[109] Bain first became familiar with the Institute in Aberdeen when aged 13 or 14 he was introduced by friends to its library.[110] In the company of other sons of artisans Bain used the resources of the Institute — both the library and the regular lectures given there — in a process of self education.[111] It was only three or four years later at the age of seventeen that Bain gave his first lecture at the Mechanics' Institute in 1835 and in following years he lectured frequently.[112] This was the beginning of a long association and in future years he was to become a member of the management committee and for many years the Institute's Secretary.[113]

It was in the period immediately after he gave his first lecture at the Institute that Bain's acquaintance with phrenology stemmed. For two or three years after 1835 he studied George Combe's Constitution of Man at the Mechanics' Mutual Instruction Class.[114] At this time, he later recalled, phrenology was at the height of its popularity in Edinburgh and had some supporters in Aberdeen. He also records in his Autobiography that he was involved in a controversy over whether phrenology was materialistic, but says no more.[115] During the summer of 1844-50 Bain spent much of his time in Edinburgh. Among his acquaintances and friends here were George Combe, his nephew Robert Fox (also a phrenologist) and Robert Chambers, the publisher who also studied phrenology extensively.[116] In 1853 Bain had discussions with another acquaintance James Straton, also a phrenologist. Straton, Bain notes, had been

occupied in preparing statistics of brain weights of people of different social classes, of various ages, occupations and 'grades of ability'.[117]

As Robert Young has noted, such rather sparse details from Bain's recollections would not constitute firm evidence of the role played by phrenology in Bain's thought were it not for the fact that in 1861 he published a book dealing almost exclusively with the subject entitled On the Study of Character : Including an Estimate of Phrenology.[118] This work attests to his deep and continuing interest in the subject, even many years after phrenology had become disreputable in Britain. In the 1850s Bain planned to take up the subject of 'Character' and discuss it according to the psychological views he had laid out in his Senses and the Intellect and Emotions and the Will. In preparation he spent two weeks in Edinburgh consulting the phrenological library of George Combe's cousin, Robert Fox.[119] Bain's interest in the 'Science of Character' and in individual differences in mental abilities did, however, predate this period. This is evident not only from passages of Senses and Emotions, but also from his contributing an article to the Aberdeen Banner in 1842 proposing a means of testing moral or emotional 'intensity of character', this topic being one of his 'hobbies' at the time.[120] Thus, Bain's interest in a science of character was long standing, although the immediate impetus to write his book may have come from J. S. Mill.[121]

In his On the Study of Character Bain began the Preface with a tribute to phrenology:

> Phrenology, notwithstanding its onesidedness, has done good service, by showing with more emphasis than had ever been done before, that human beings are widely different in their mental tastes and aptitudes, and by affording a scheme for representing and classifying the points of character, which is in many respects an improvement upon the common mode of describing individual differences.[122]

He also stated that it was "the only System of Character hitherto

elaborated."[123] His characterization of phrenology is based mainly upon George Comb·'s System of Phrenology, on the writings of Gall and Spurzheim and on articles in the Phrenological Journal. His aim was to show that phrenological faculties were not the ultimate determinants of character and that a true science of character could be deduced from the laws of association, the pleasure-pain principle and his own concept of primitive mental elements.[124] A large part of this book consists of an extensive and systematic commentary on each of the thirty-five phrenological faculties which had been set out by Combe in his System of Phrenology. Throughout the book Bain accepts several phrenological assumptions. He not only accepts the principle of cerebral localization, which had first been laid out by phrenologists, but also the cranioscopic method, as long as it was rigorously applied.[125] He also accepted the general view that the size of the brain was related to 'mental power' and quoted Combe in support of this.[126] Indeed, in general he agrees with the view that head size is a good indication of differences in ability:

> If there be any point of physical conformation that regularly accompanies a copious natural activity, it is size of head taken altogether, this will hold for the Races and for the most unquestionable instances of individual men and women.[127]

Such an assumption became commonplace within physical anthropology long after the decline of phrenology itself.[128] Several years later Bain was still attracted to some of the general claims of phrenology, writing that human beings possess

> a certain natural force of character having its physical supports of brain, muscle, and other tissues, and neither persuasion, nor even education, can go very far to alter that character. If there be anything at all in the observations of phrenology, it is in the connection of energetic determination with size of brain. Lay your hand on the head of an energetic man, and then on the head of a feeble man and you will find a difference that is not to be explained away...it passes all powers of persuasion and education combined to make up for a great cranial inequality.[129]

There is no doubt at all of Bain's long-term commitment to some of the teachings of phrenology and the relevance of his interest in this subject for an understanding of his other writings.

It is clear from Bain's recollections and his published work that it was through his acquaintance with phrenology that he really began to take an interest in individual differences in mental ability, and that he gave the subject deep and sustained attention. As I noted above, individual differences in mental endowment was a major theme of the phrenological literature. Even after the decline in the popularity of phrenology, its assumptions continued to shape Bain's thought and his interest in phrenology illuminates the link between his psychological theories, his social position and Victorian society. Like the majority of those who developed some form of commitment to phrenology, Bain was born into an upper working class family and aspired to higher things.[130] His close connection with the Mechanics' Institute and his political Liberalism are also in keeping with this picture. Finally, like many other sons of artisans who rose to the middle classes, Bain sought to enlighten his fellow citizens in order that they too could rise up the social scale. This is evident in his giving lectures to the Mechanics' Institute and in several contributions he made to Robert Chambers' serial entitled Papers for the People,[131] which was a work dedicated to the principle of self improvement.

Bain gained several things from his familiarity with phrenology. It was through his acquaintance with it that he first encountered the view that human intellectual, moral and emotional differences were rooted in the physical structure of the brain and nervous system; it provided an example of a means for differentiating people according to their particular abilities; it taught that there was a correspondence between mind and brain, and that the size of brain was related to mental power. Phrenology helped shape Bain's initial approach to the question of mental

ability and provided a pool of knowledge and ideas which he drew upon.

The Meritocratic Image

I have argued that the constitution of a science of individual differences in mental ability involved in a fundamental way social, political and economic forces. Alexander Bain developed a theory of why people differed in mental ability and provided a biological explanation and justification for the social structure of mid-Victorian Britain. The approach taken by Bain involved the utilization of already existing bodies of knowledge, such as association psychology and phrenology, in terms of his own social, political and intellectual commitments. In Bain's writings, however, the concept of mental ability was vague, ill-defined and often confused; he did not feel the need to expand upon it; after all, were not mental differences plain for all to see in the division of labour and in the different levels of civilization between races?

In the following chapter I argue that a concern with mental ability and means of quantifying it was not peculiar to him, and that his approach was taken up and extensively developed by Francis Galton and others.

Chapter Three

Notes

1. (Jensen: 1969).
2. See (Block, Dworkin:1977) for an overview, also (Harwood: 1976; 1977; 1979; 1982).
3. For exceptions see (Lewontin:1977a,8; (1970) 1977b,111-12),(Chomsky: 1977, 296-97).
4. For surveys of the development of mental tests see (Burt:1924), (Dubois:1970),(Evans, Waites:1981), (Hearnshaw:1970), (Peterson: 1925), (Tuddenham:1966), (Watson:1970), (Weinland:1970),(Young: 1923).
5. (Boring:1950, 235).
6. (Flugel:1938,79-80).
7. (Murphy:1949, 107).
8. (Sokal:1980, 170).
9. See (Bain:1904, 32), (Hearnshaw:1964, 9,14).
10. (Boring:1950, 233-40), (Hearnshaw:1964,1-14).
11. The exception to this is (Cardno:1963). However, although Cardno recognizes that Bain gave "sustained, comprehensive and penetrating" attention to individual differences, his article goes no further than to present quotations by way of support for this thesis.
12. For details of Bain's life and work see (Bain:1904),(Cross:1970), (Young:1970, Chap.4), (Hearnshaw:1964, 1-14), (Cardno:1955;1956; 1963).
13. (Bain:1904,3). On the steadily more arduous life of handloom weavers see for example (Briggs:1959a,301-2).
14. For a comprehensive discussion of self education and mechanics' institutes see (Harrison:1961).
15. (Bain:1904, 43-44, 65).
16. (Hearnshaw:1964, 9).
17. (Mill:1859,(1867),99).
18. This account of the association psychology is based on (Warren: 1923), (Young:1970; 1973a), (Croom Robertson:1877), (Mill:(1859) 1867), (Boring:1950), (Rapaport:(1938)1974).
19. See (Young:1973a),(Oberg:1976).
20. (Warren:1921, 81).
21. (Young:1970, 98).
22. (Boring:1950, 236).
23. (Young:1970, Chap.3).
24. (Bain:1904, 218-19).
25. (Mill:(1859) 1867, 199).
26. (Bain:1859, preface).
27. (Bain:1893a).

28. (Young:1970, 15-16).

29. (Bain: 1855, 1).

30. (Bain: 1859,1; 1861, 191). In the first instance Bain derived this schema from the writings of the Scottish philosopher Sir William Hamilton (Hearnshaw: 1964, 6), (Cross: 1970, 5).

31. (Mill: (1859), 1867, 122).

32. Ibid, 132. Bain's Emotions and the Will is built upon this perspective.

33. (Bain: 1855, 5; 1861, 254-60; 1879a,15).

34. (Bain: 1879a,15-16).

35. On this point see (Mill: 1859, 148-49).

36. (Bain: 1879a,16).

37. (Bain: 1855, 110-12).

38. Ibid, 110.

39. See (Boring: 1950).

40. (Bain: 1855, 256).

41. (Bain: 1859, 387).

42. Ibid, 623.

43. (Bain: 1861, 254).

44. He held that Talent was the power to do well what had been done before and Genius the power of originality (Bain: 1861, Chap. 14, 15).

45. (Mill:(1843) 1872, 869). For a discussion see (Leary: 1982), (Young 1970, 124).

46. See for example (Bain: 1861, 260 ff).

47. This work was extremely popular; for example, within six years of publication it had been translated into French, German, Spanish and Italian and had also passed through numerous reprints (Bain: 1904, 431).

48. Bain was also one of the founders of the Education Society in 1875 (Armytage: 1965, 158). On his involvement in educational reform see his essays "The Classical Controversy", "The University Ideal, Past and Present", "Religious Tests and Subscriptions", all repr. in (Bain: 1884). See also (Humes: 1979).

49. (Bain: 1879a,7-8).

50. Ibid, 16-20.

51. Ibid, 7-8.

52. Ibid, 12-13, 21; (Spencer: 1870, Vol.1, esp. 570-79). For a discussion see (Smith: 1982a). Bain's second and subsequent editions of the Senses owed a certain amount to Spencer's writings. He held back the second edition in order to use Spencer's latest writings in his Principles of Biology (1864); see (Spencer: 1904, 98-99), (Duncan: 1908, 111). After the publication of Bain's book Spencer wrote to him:

> I see that you have made some reference to my speculations and criticisms, and have done so in a friendly spirit...
>
> qu. (Duncan: 1908, 116).

53. (Bain: 1879a 34).

54. quoted (Houghton: 1957, 1).

55. See (Houghton: 1957, Chap.1), (Harrison: 1971), (Clark: 1962).

56. See (Barton: 1976, Chap.2) for a relevant discussion, also (Roach: 1957).

57. (Clark: 1962, 48).

58. (Perkin : 1969, 252-70).

59. (Barton: 1976, 70).

60. For a discussion see, for example, (Young: 1960, 9, 48, 52-53).

61. (Perkin : 1969, 252-70, esp. 258).

62. (Mill: (1859) 1875, 21).

63. Ibid, 21-22; see also (Mill: 1861, 284-86) where he elaborates the argument.

64. (Bain: 1904, 15).

65. Ibid, 376.

66. Bain and Mill first became acquainted in 1839 while Bain was still a student at Marischal College. They first met in 1842 and from this time were firm and close friends, meeting regularly, criticising each other's works and campaigning together in politics. (Bain: 1879b;1880a).

67. Indeed, such opposition to the established church was a hallmark of nineteenth century Liberalism.

68. (Bain: 1904, 315).

69. Ibid 371-72. See also (Bain: 1884, 257-88) where he forcefully argues against such Tests. Aberdeen was the last university in Europe to abolish Tests.

70. (Bain: 1904, 196-210). On Chadwick and public health legislation see, for example, (Young: 1960, 55-58).

71. (Mill: 1861, 282.)

72. Ibid, 283.

73. Ibid, 284.

74. (Bain: 1861, V).

75. Ibid, V-VI.

76. (Bain: 1879, 531).

77. See (Berg: 1979;1980, 179-202).

78. (Berg: 1979, 41), see also the excerpt from this work in (Berg: 1979, 41-55).

79. (Briggs: 1959a,394-95).

80. For an excellent discussion see (Harrison: 1961, Chap. 5; 1971, 134-45).

81. (Perkin: 1969, Chap. 7).

82. (Briggs: 1959a,410), (Heyck: 1982).

83. (Mill: 1869, 445-46).

84. (Bain: 1861, 273-75).

85. (Mill: 1869, 452).

86. (Bain: 1861, 203).

87. The meritocratic social philosophy espoused by Bain and other Liberals also encompassed a call for educational reform. For a discussion of their place within educational reform movements see (Armytage: 1965, Chap. 6-8).

88. On the growth of examinations see (Roach: 1971), (Montgomery: 1965).

89. (Roach: 1971, 5). See (Cardwell: 1972, 85) for a list of the more important examinations instituted at this time.

90. (Roach: 1971, 4), (Perkin: 1969, 258-59). Competitive examinations in the public service were explicitly intended to end abuses of the existing system of appointment and promotion.

91. quoted (Montgomery: 1965, 21). On the reform of the civil service see Ibid, 20-31; (Roach: 1971, Chap. 8-9); see also (Barton: 1976, 260-79) for a discussion of Liberals and education. The Northcote-Trevelyn Report of 1853 recommended that the civil service should be divided into two main groupings - the intellectual and the mechanical (the latter performing routine copying duties), both being recruited by competitive examinations. The Report also recommended that promotion be by means of merit rather than seniority (Briggs: 1959a,442).

92. (Bain: 1904, 250).

93. (Bain: (1877) 1884; 1904, 337-38).

94. See (Parsinnen: 1974), (McLaren: 1974), (Cooter: 1976, 1978), (Shapin: 1975), (Cantor: 1975), (Bynum: 1974, Chap. 4), (De Guistino: 1975).

95. Indeed, as it developed, phrenologists both in the form of the work which they produced and in their institutional affiliations, sought to align themselves with Natural History and emphasized observation, description and comparison rather than experiment (Bynum: 1974, 193-94).

96. Ibid, 171.

97. (Young: 1970, Chap. 1).

98. (Fee: 1979), (Hoyme: 1953).

99. (Fee: 1979), (Bynum: 1974, Chap.4).

100. (Parsinnen: 1974, 2), (Cooter: 1978, 26-27), (Shapin: 1975).

101. (McLaren: 1974), (Bynum: 1974, 184-91).

102. (Cooter: 1978, 163-74).

103. (Parsinnen: 1974, 5).

104. Ibid, 5-6.

105. (Bynum: 1974, 197).

106. (De Guistino: 1975, 17-19).

107. (Cooter: 1978, 93). Phrenological doctrines were also used to account for racial differences and several major phrenologists such as George Combe devoted space in support of this view. (Bynum: 1974, Chap.4), (De Guistino: 1975, 68-72).

108. For a useful discussion of Bain and phrenology see (Young, 1970, Chap.3), although Young does not discuss Bain's interest in individual differences.

109. See for example (Harrison: 1971, 114-17).

110. (Bain: 1904, 16-17).

111. See (Harrison: 1961) for an excellent discussion of Mechanics' Institutes. (Royle: 1971) argues that students at the Institutes were drawn from both the lower middle class (clerks, shopkeepers) and the more prosperous and upwardly mobile elements of the working class. Bain fits this picture very well.

112. (Bain: 1904, 26). For example, after he began his formal education at Marischal College Bain continued to teach a mathematics class at the Institute and a year or two later gave lectures on "Philosophical Genius, also Involving the Theory of Discovery", ibid, 43-44, 65.

113. Ibid 16-17.

114. This work of Combe's was the central text of the popular phrenology movement in Britain, see (Parsinnen: 1974, 3,5), (Cooter: 1978, esp. Chap.3).

115. (Bain: 1904, 27-28). At this time Bain also records having read Andrew Combe's medical works. These works were, like those of his brother George, intended for popular consumption and sought to help people help themselves to live healthily and happily. For a discussion see (Cooter: 1979).

116. (Bain: 1904, 215). Robert Chambers was also the anonymous author of Vestiges of the Natural History of Creation and in this work drew upon the ideas of phrenology, particularly George Combe's Constitution of Man, see (Young: 1970, 122; 1973b,204).

117. (Bain: 1904, 237-78).

118. See (Young: 1970, 122-23). Bain's book was originally published in several parts in Fraser's Magazine. It was never very popular and Bain noted that it had a slow but steady sale; it was never revised nor republished, probably because he was wary of receiving criticism.

119. (Bain: 1904, 256-57).

120. Ibid, 132.

121. (Young: 1970, 123-24).

122. (Bain: 1861, V).

123. Ibid, vi.

124. Ibid, 29-30.

125. Ibid, 24. There is, however, no evidence that Bain himself made any observations of crania.

126. Ibid, 19-22; see also (Bain: (1868) 1878, 19ff).

127. (Bain: 1861, 144).

128. See for example (Hoyme: 1953), (Fee: 1979), (Bynum: 1974, Chap.4). Bain also argued that there were emotional differences between races, stating that, for example, Scots were emotional in comparison to the 'Teutonic Races' (Bain: 1861, 218).

129. (Bain: (1868) 1884, 27).

130. He also notes in his Autobiography that his brothers and sisters had been 'failures in life'; this perhaps spurred him on his quest to better his social position (Bain: 1904, 3).

131. See (Bain: 1904, 210, 212). For example, Bain contributed an article entitled "Education for the Citizen".

CHAPTER 4

FROM BIOGRAPHY TO A SCIENCE OF THE MIND: FRANCIS GALTON AND MENTAL ABILITY

> Thomas Gradgrind, sir — peremptorily Thomas — Thomas Gradgrind. With a rule and a pair of scales, and the multiplication table always in his pocket, sir, ready to weigh and measure any parcel of human nature, and tell you exactly what it comes to. It is a mere question of figures, a case of simple arithmetic.
>
> Charles Dickens *Hard Times* (1854) (Penguin: Harmondsworth, 1969),48.

Francis Galton's contribution to the development of mental testing has received considerable attention from both psychologists and historians. Although large numbers of references are made to this work in psychology textbooks and in historical studies, there rather surprisingly exists no detailed analytical account of why Galton developed his tests, why they took a particular form, and the precise 'legacy' of Galton's work for later researchers. To a great extent Galton's writings on the subject have been overshadowed by his image as a 'Founding Father'. One of my aims in this chapter will be to probe beneath the complex mythology which has been erected around Galton and his work to consider his psychological writings in the context of the scientific subculture of Victorian Britain and the wider background of that society in general.

Although in recent years considerable attention has been shown by historians in Galton's work, this has concentrated on his genetic ideas, his statistical innovations, or his eugenical beliefs and has comparatively neglected his contribution to psychology.[1] Galton is credited with being the first person to use studies of twins to investigate the question of nature versus nurture; with making the first attempt to develop methods of classifying people according to their mental ability; with developing the statistical techniques out of which modern differential psychology grew. The most common portrayal of Galton has been that he was a lone figure who, all by himself, founded mental testing. It has even been suggested that Galton was a 'great man' who exemplified individual differences in mental ability. In 1917 Lewis Terman, who did much to promote testing in the U.S., even went so far as to posthumously estimate Galton's I.Q. to be 200![2] Contrary to the 'orthodox' perspective, I want to argue that Galton did not somehow produce his work on mental ability by some feat of pure intellectual genius. His work in this area was fundamentally related

to his social position in Victorian Britain and the structure of that society. At the same time, he framed his work within the writings of contemporary psychologists, anthropologists, and social commentators.

In the previous chapter I argued that concern about, and theorising of, individual differences in mental ability did not begin with Galton. In what follows I will move on from the insights gained from that discussion of the work of Alexander Bain to analyse Galton's place in a developing tradition of conceptualizing human nature in a particular way.

The Aristocracy of Intellect

Francis Galton was born and married into the intellectual elite of Victorian society. Details of his biography provide an important basis for a consideration of why he was interested in developing ways of measuring 'mental ability'.[3] The select group to which Galton was attached socially has been aptly termed the 'intellectual aristocracy'.[4] Families of this grouping were originally Quakers, Unitarians, or members of the Clapham Sect, and distinguished from the bulk of the bourgeoisie by their philanthropic concerns. The children of marriages tended to abandon the world of business for that of education, scholarship and the professions. Family links, strengthened by further intermarriage and a shared commitment to educational and administrative reform maintained a group identity. Later in the nineteenth century many converted to the established church and took degrees at the older universities. They never, however, saw themselves as part of the aristocracy proper and politically their commitment was to piecemeal reform. In the 1860s and 70s they were united over issues such as the reform of the civil service, abolition of religious tests and support of competitive examinations as a means of attacking privilege. Only towards the end of the century did they lose their political homogeneity and align themselves on a spectrum from Conservative to Fabian.

In many ways Galton's life fits this pattern neatly. He was born in 1822, the youngest of seven children of Samuel Tertius Galton, a successful Birmingham banker, and Violetta Darwin, one of Erasmus Darwin's daughters. In common with others of the intellectual aristocracy he came from a Quaker family, supported social reform and moved in the circles of the Victorian intellectual establishment — the Royal Society, the British Association, The Athenaeum. After a somewhat prodigious childhood and a rather undistinguished school career Galton's parents decided that he should enter the medical profession and at the age of sixteen he became a pupil at Birmingham General Hospital. In the following year, 1839, he enrolled in Kings College Medical School in London. At the end of the year he decided to interrupt his medical training to take a mathematics degree at Trinity College, Cambridge. At Cambridge Galton was rather undistinguished and left in 1843 with an ordinary (Poll') degree, having suffered a nervous breakdown just before his final honours exams. After spending a short period resuming his medical studies he gave them up for good on the death of his father in the autumn of 1844. This left Galton with a large inheritance which enabled him to live as he pleased and do what he wished for the rest of his life. He quickly dropped his plans to be a doctor and instead set off for a tour of the Middle East. This was the first of a series of extended trips which he made over the next eight years, including one to Africa under the auspices of the Royal Geographical Society. After his return from Africa in 1852 he began to settle down and took up residence in London.

In the following years Galton wrote an account of his African explorations entitled Tropical South Africa (1853) and became active on the Council of the Royal Geographical Society. Two years later he used his travel experience to write The Art of Travel, a guide for travellers who had 'to rough it'. At the same time Galton became active

in scientific circles in London. In 1856 he was elected to the Royal Society, to the board of management of Kew Observatory in 1858, and to the Royal Statistical Society in 1860. He also published scientific papers on subjects such as mapmaking, geographical measurement and instruments, and weather prediction. In 1868 he became a member of the Meteorological Council which supervised the activities of the Meterological Office of the Board of Trade, remaining a member until 1907. Similarly he remained a member of the committee which was responsible for Kew Observatory for forty-three years. He also served in various official positions with the Royal Society, British Association and Anthropological Institute.

In the early 1860s, Galton's interests began to shift decisively towards biology.[5] It is clear that for the rest of his life almost all his research was directed towards heredity and related questions. It was also at this time that Galton became convinced of the need for eugenic policies to reform society. This belief shaped his scientific work until the end of his life. During the 1860s he pursued various lines of research into the predominance of heredity over environment, culminating in his Hereditary Genius (1869). In the early 1870s he devoted much of his time to the physiological mechanisms of heredity. From 1880 to 1890 his researches were many and varied, encompassing the designing of means to test human abilities, both physical and mental; studies of composite portraiture and elaborate statistical analysis. He also published two further books, Inquiries into Human Faculty (1883) and Natural Inheritance (1889).

In the 1890s Galton consolidated his work primarily by helping Karl Pearson and W.F.R. Weldon extend his statistical techniques to biological phenomena. With their aid he also founded a biometric laboratory at University College, London. After the turn of the century he actively and energetically sought to bring eugenical policies to

public notice. Although he had announced his plans for the reform of society by means of controlled breeding as early as 1865, his ideas had not struck a responsive chord until this time. Galton gave public lectures, wrote popular articles and attended countless public meetings to further his eugenic cause.

By the time of his death in 1911 Galton had been awarded almost every major honour that could be bestowed on a British scientist: the Darwin-Wallace medal of the Linnean Society; the Gold medal, Copley medal, and Darwin medal of the Royal Society; the Huxley medal of the Anthropological Institute; honorary degrees at Oxford and Cambridge and finally a Knighthood. He died in the knowledge that he had been the founder of a flourishing political movement (eugenics) and of a blooming research tradition in science (biometry).

In 1865 Galton published an article entitled 'Hereditory Talent and Character' in two successive issues of MacMillans Magazine. He commenced with the bold statement that

> The power of man over animal life, in producing whatever varieties of form he pleases, is enormously great. It would seem as though the physical structure of future generations was almost as plastic as clay, under the control of the breeders' will. It is my desire to show, more pointedly than - so far as I am aware - has been attempted before, that mental qualities are equally under control.[6]

This essay marked a new departure in Galton's list of published works. Whereas his main areas of interest had been meteorology and geography, this paper signalled the beginning of a move towards ethnology, psychology and biology. It also contained, as the above quotation illustrates, the first public presentation of his proposals for a reformulation of society based on the implementation of eugenic policies. It has been forcefully argued by recent historians that one of the main driving forces in Galton's scientific work was his eugenical beliefs.[7] Indeed, Ruth Cowan has argued that

> Galton's commitment to the ideal of a eugenic society is the single most important clue to understanding the direction and import of the work that he did in genetics, statistics, psychology, and anthropology.[8]

Galton's vision of a society based upon eugenic principles rested upon his ideas about the inheritance of mental qualities. In order to provide support for his case for such a form of social organization Galton felt it necessary to demonstrate that mental qualities were inherited, and that inheritance was the main determinant of such qualities.[9] Galton's presentation of his eugenic proposals in 1865 was only the first attempt which he made to bring his ideas to public attention, and in ensuing years he considerably expanded his initial outline of a eugenic utopia.

He argued in 'Hereditary Talent and Character' that the carefully chosen early and fertile marriage of the most able would greatly increase the stock of ability in the population and that the state should intervene to promote this end. Bluntly, he stated that

> No one I think, can doubt, from the facts and analogies I have brought forward that, if talented men were mated with talented women, of the same mental and physical characters as themselves, generation after generation, we might produce a highly gifted race...[10]

It has been argued by Donald Mackenzie that Galton's eugenic programme was tied to his social position in two ways. First his early theorising drew upon his social experience as a resource, the form of his eugenic ideas reflecting the form of organization of his social group and, at the same time, legitimating it. Secondly, his eugenics can clearly be seen as part of the wider movement in thought, known as 'scientific naturalism' which in part expressed the social interests of scientific professionals.[11] As I noted earlier, Galton belonged to a tightly knit grouping in the emerging Victorian professional middle class. His argument in the pages of Hereditary Genius (1869) was in part directed towards demonstrating that this elite was a natural rather than a social one. His proposals for eugenic reform entailed precisely

the kind of society which would benefit his social group most. Thus he declared that:

> The best form of civilization in respect to the improvement of the race, would be one in which society was not costly; where incomes were chiefly derived from professional sources, and not much through inheritance; where every lad had a chance of showing his abilities and, if highly gifted, was enabled to achieve a first class education and entrance into professional life, by the liberal help of the exhibitions and scholarships which he gained in his early youth.[12]

The type of society which Galton wished to see established was one based upon merit rather than patronage and the policies which he advocated were those which many other members of the intellectual aristocracy pressed for.[13]

Galton's writings also betray an allegiance to Victorian scientific naturalism.[14] It is clear from his work that his eugenics was based upon a view of human psychology which reduced the mind to a collection of 'natural abilities' and personality traits and excluded the validity of concepts such as the 'soul'. Through his position in London scientific circles Galton was close to such leading proponents of scientific naturalism as T. H. Huxley and John Tyndall. The naturalistic orientation of his work is clear, and he wished to do no more than banish the authority of religion from science. It has recently been argued by F. M. Turner that the Victorian conflict between naturalistic and religious world views was more than just a clash of ideas. At issue was who should have authority to pronounce on the universe and society and who would gain the worldly advantages which would stem from that authority.[15] By denying the legitimacy of the supernatural, by curtailing the universe to what was known by existing science, the proponents of naturalism established the status of science as a valid cultural form. Galton's works display his place within this struggle. In his English Men of Science (1874) he looked forward to

> the establishment of a sort of scientific priesthood throughout the kingdom whose high duties would have reference to the health and well-being of the nation in its broadest sense.[16]

Galton's eugenics can be seen as a system of belief conforming to the activities of such a 'scientific priesthood'.[17]

The Inheritance of Ability

In 'Hereditary Talent and Character' Galton boldly proclaimed that

> I find talent is transmitted by inheritance to a very remarkable degree.[18]

Using biographical dictionaries, the biographies of Lord Chancellors, Senior Wranglers at Cambridge, and of literary figures, he tried to demonstrate that 'talent' was inherited to a great extent. He argued that a significant number of relatives of eminent individuals were themselves eminent, an observation which he accounted for by the view that ability was inherited.[19] After a short discussion of animal breeding he stated:

> I can only say that the general resemblances in mental qualities between parents and offspring, in man and brute, are every whit as near as the resemblance of their physical features, and I must leave the existence of actual laws in the former case to be a matter of inference from the analogy of the latter.[20]

He argued that since animals could be bred for their physical qualities and that animal breeders could produce offspring of a predetermined character, then by analogy this must also apply to 'mental qualities'. He was, however, aware of the deficiencies in what he was trying to do:

> ...I cannot prove it. All I can show is that talent and peculiarities of character are found in the children, when they have existed in either of the parents to an extent beyond all question greater than in the children of ordinary persons.[21]

Galton said nothing about the number of talented people born to those not already known to possess talent, nor did any of his evidence give him grounds for discounting an environmental explanation. As Ruth

Cowan has argued, this paper was motivated by Galton's passionate commitment to a vision of a society organized along eugenic and meritocratic lines, to the exclusion of a well thought out or argued analysis.[22]

Galton's attempt to investigate the inheritance of mental ability by statistics of familial resemblance was continued at much greater length four years later in Hereditary Genius. He began this work with a statement echoing his 1865 paper:

> I propose to show in this book that a man's natural abilities are derived by inheritance, under exactly the same limitations as are the form and physical features of the whole organic world.[23]

In this very first paragraph he also introduced his eugenic commitments, stating that

> it would be quite practicable to produce a highly gifted race of men by judicious marriage during several generations.[24]

One of his main aims in this volume was to investigate the 'laws of heredity' as they related to mental ability. His method was an expansion of that used in "Hereditary Talent and Character" — to demonstrate that in a large number of cases men who are 'illustrious' have 'eminent' relatives. Although he initially claimed that his plan was to show that high reputation was an accurate test of ability and then to obtain from an examination of the familial relationships of a large body of eminent men a general survey of the 'laws of heredity relating to genius', his book takes a much broader sweep than this. He also discussed at length the extent of differences in mental ability and the form of distribution of ability in the population as a whole.

He began the main part of his discussion by attempting to estimate the number of 'illustrious' and 'eminent' men in the population. This he did by noting the number of 'celebrities' over the age of 50 he could find in a biographical handbook Men of the Time (1865) and

comparing this with the number of men over 50 in the population as a whole. He found the names of 850 men of whom he thought 500 were well known to 'persons familiar with literary and scientific society'. Since there were 2 million males of this age in Britain he arrived at the number of 'eminent' men as 250 per million (1 in 4,000). He then reserved the term 'Illustrious' for the most famous.[25]

Galton now, however, changed tack to discuss differences in mental ability in general and how it was distributed in the population. To begin with he discussed the existing range of mental ability, taking as an example university examination results:

> There can hardly be a surer evidence of the enormous difference between the intellectual capacity of men, than the prodigious differences in the number of marks obtained by those who gain mathematical honours at Cambridge.[26]

He appears to have viewed the large differences in examination marks as exemplifying how much mental ability in general differed among people.[27] The chapter continues with an anecdotal account of differences in mental ability, concluding:

> ..the range of mental power between — I will not say the highest caucasian and the lowest savage — but between the greatest and the least of English intellects, is enormous. There is a continuity of natural ability from one knows not what height, and descending to one can hardly say what depth.[28]

To examine the ways in which mental ability was distributed in the population he utilized the work of Adolphe Quetelet, extending Quetelet's use of the 'law of deviation from the average'.[29] After explaining Quetelet's use of the error curve and illustrating it with statistics of height given by Quetelet in his book, he proceeded to justify the use of it to apply to mental ability. He claimed

> if we had measurements of the adult males in the British Isles, we should find those measurements to range in close accordance with the law of deviation from an average. Now, if this be the case with stature, then it will be true as regards every other physical feature — as circumference of head, size of brain, weight of grey matter, number of brain fibres, etc.; and thence, by a

> step which no physiologist will hesitate, as regards mental capacity...analogy clearly shows that there must be a fairly constant average mental capacity in the inhabitants of the British Isles, and that deviations from that average — upwards towards genius, and downwards towards stupidity — must follow the laws that govern deviations from all true averages.[30]

Apart from this rather specious analogy Galton only presented one item of evidence to support the applicability of the normal distribution to mental ability. This was based upon an examination of the distribution of examination marks of candidates for admission to the Royal Military College at Sandhurst. He found that this distribution closely followed that predicted by the law of deviation from an average. Finally, having proved to his satisfaction that the error curve was applicable to mental ability, he proceeded to construct a picture of the distribution of ability in the British population as a whole. This he did by dividing it into fourteen classes (G,F,E,...,A; a,b,c,...,g) separated by equal 'grades of mental ability'. He calculated the numbers in each class by assuming that in the top two classes (F and G) there were approximately the number of eminent men he had earlier estimated (i.e. 250 per million). He concluded that although at one end of the scale there were very gifted men, these were balanced by the number of 'idiots and imbeciles' at the opposite end:

> Hence we arrive at the undeniable, but unexpected conclusion that eminently gifted men are raised as much above mediocrity as idiots are depressed below it.[31]

After this long discussion of the distribution of ability he returned to a consideration of whether he was justified in using reputation as a good indication of mental ability. His argument in support of this assumption was based on his belief that

> I look upon social and professional life as a continuous examination. All are candidates for the good opinion of others, and for success in their several professions, and they achieve success in proportion as the general estimate is large of their aggregate merits.[32]

What his argument basically amounted to was that only those with 'natural ability' rose to achieve eminence and that the eminent were those of natural ability; in other words his argument was circular. This basic theme was embroidered with anecdotal evidence in an attempt to support it, but he only succeeded in continually reiterating his belief that those of ability always rise in society, and that those having public recognition possess ability. Here he rested his case for employing his biographical method to prove that mental ability was inherited:

> I see no reason to be dissatisfied with the conditions of accepting high reputation as a very fair test of high ability.[33]

This outline of Galton's project in Hereditary Genius throws up many questions. What was his concept of mental ability? What was original about his analysis? What scientific traditions and resources did he draw upon? How did he construct his image of human nature?

The Concept of Mental Ability

It has recently been argued that when Galton wrote 'Hereditary Talent and Character' and Hereditary Genius, the inheritance of mental ability was not commonly accepted and that the dominant conviction was that it was primarily determined by environment.[34] This view perpetuates the image of Francis Galton as a lone figure who was solely responsible for developing a hereditarian theory of mental ability. Furthermore, was it really the case that environmentalism was the dominant ideological current of the time?[35] As I argued in my discussion of the work of Alexander Bain, Galton was by no means the first or only person in the mid-nineteenth century to propose a theory of mental ability in which heredity played a prominent role.[36] It was quite simply not the case that in ethnology and psychology environmentalism dominated the field in the 1860s and almost until the turn of the century.[37]

In the particular case of Galton's views on mental heredity and ability one relevant context is anthropology and ethnology, which in

mid-Victorian Britain were far from being dominated by environmentalist attitudes. The 1850s and 1860s saw the formation of a racist ideology based on science. This involved a change in attitudes from the humanitarian response to slavery of the early nineteenth century towards the racialism of the imperialist age at the turn of the century.[38] Although these decades saw a rise of interest in racial questions there was by no means a consensus view either of what constituted a race or what criteria should be used in assessing racial differences. One of the commonest non-physical methods employed was language and there were debates over the meaning of language differences and the geographical pattern of particular language usage.[39] Linguistic criteria were not the only ones employed but were part of an anthropological practice which also involved physical means of classifying races. Concern was shown about skin colour, hair texture and colour, and increasingly, techniques of comparative anatomy. In the 1850s there was a shift from purely considering head shape and size to the total physique. At the same time tribes and races were more frequently and stridently compared as biological units. A wide variety of physical characteristics were examined including variations in width of nose, circumference of chest and length and shape of bones.[40]

Within Victorian anthropological debate it was only a short step from classifying races to describing them as unequal and arranging them on a hierarchical scale with white, male, caucasians at the top.[41] Few commentators doubted that there was a racial hierarchy and few refrained from conceptualizing it in ethnocentric, racialistic terms. One such attempt was made by Frederic W. Farrar, Classics master at Harrow and later Headmaster at Marlborough School.[42] In a paper presented to the Ethnological Society of London, Farrar argued that four racial distinctions could be made — savage races, semi-civilized races and two civilized ones.[43] He claimed that in the case of 'savage races':

> The features of these tribes is invariable and expressionless, and their minds are characterized by a dead and blank uniformity...each century sees them in the same condition as the last, learning nothing, inventing nothing, improving nothing, living in the same squalid misery and brutal ignorance, neither wiser nor better than their forefathers of immemorial epochs back.[44]

Farrar conceived of racial differences in biological terms and argued that there were inherent differences in the intellectual aptitudes of the racial groups as well as in their moral and physical endowments. Such arguments were commonplace in British anthropology of the late 1850s and 1860s. Time and again it was argued that there were differences in the moral and intellectual characteristics of different races. For example, in his exhaustive discussion of racial differences G. O. Croom Napier presented what was almost an archetypal argument about racial differences, concluding that "Anglos have the highest moral capacity and the greatest intellectual power and activity".[45] The use of a concept of intellectual ability in ranking races was almost universal.

Francis Galton's 'Hereditary Talent and Character' and Hereditary Genius should be read against the background of this growth in scientific racism. Both of these works exhibit his interest in physical anthropology and ethnology. Galton began the Preface to Hereditary Genius by stating that

> The idea of investigating the subject of hereditary genius occurred to me during the course of a purely ethnological inquiry, into the mental peculiarities of different races, when the fact, that characteristics cling to families, was so frequently forced on my notice as to induce me to pay especial attention to that branch of the subject.[46]

Galton's interest in questions of race and racial differences were long-standing and in part the outcome of his years as an 'explorer' in Africa. In 1850 he had set off on a journey to South West Africa under the auspices of the Royal Geographical Society. He spent two years there, travelling extensively through areas in which no other

European had ventured. Galton wrote several accounts of this, including Tropical South Africa (1853).[47] The accounts which Galton published of his African experiences suggest that they may have played a role in the development of his hereditarian psychological theories.[48] Galton viewed the natives he encountered from within the prevailing ethnocentric perspective of his day. His impressions of Africans were negative and outspoken. For example, of his first encounter with them he wrote:

> A row of seven dirty, squalid natives came to meet us... They had Hottentot features, but were of a darker colour, and a most ill-looking appearance; some had trousers, some coats of skin, and they clicked, and howled, and chattered, and behaved like baboons.[49]

Galton returned from Africa convinced not only of the general intellectual inferiority of the natives but also of the great divergences in the character of the various groups. He viewed Africa as inhabited by many innately differing but more or less inferior races.

Galton's interest in ethnology was certainly more concrete by 1862 when he became a Fellow of the Ethnological Society of London.[50] The Ethnological Society of London was founded in 1843 and grew out of the activities of the Aborigines Protection Society.[51] In the mid-1850s the Society went into a period of decline and by 1858 there were only 38 members. At the end of the decade the society began to revive under the impact of deep changes within anthropology, in particular the new more harshly racial approach to human differences. At the same time there were writers outside the E.S.L. who were taking approaches to race which rejected environmentalism and argued that the idea of human equality was false. It was in this context that the E.S.L. came to life again in 1859 and 1860. However, the Society never failed to reflect something of its humanitarian, Quaker, and Evangelical origins and was politically Liberally inclined.[52] Galton no doubt felt at home in the atmosphere of the society because of his Quaker background and his Liberal political affiliations. Likewise he would have found

its Darwinian inclination congenial - leading Darwinians such as T. H. Huxley and Sir John Lubbock were members.[53]

Galton clearly displayed his commitment to the new racist anthropology in "Hereditary Talent and Character". In this work he wrote of

> ... the typical features and characters of different races of men. The Mongolians, Jews, Negroes, Gypsies, and American Indians severally propagate their kind; and each kind differs in character and intellect, as well as in colour and shape from the other four. They and a vast number of other races, form a class of instances worthy of close investigation, in which peculiarities of character are invariably transmitted from the parents to the offspring.[54]

He claimed that there was abundant data to prove the diversity in the character of human races. One example he gave was of American Indians; another drew upon his experiences in Africa and concerned the "typical West African Negro". This section of his paper faithfully follows the form and content of much of the anthropological writings of the period in its explicitly racist outlook, treatment of races as biological units and his reliance on descriptive anecdotes as evidence. It is clear from his discussion that the peculiarities of races forms an integral part of his whole project in this paper.

In Hereditary Genius Galton included a chapter entitled "The Comparative Worth of Different Races". This chapter was predicated on what Bernard Semmel has termed 'external social Darwinism' — the view that there is a 'struggle for existence' between nations.[55] Galton argued that

> Intelligence is as much an advantage to an animal as physical strength or any other natural gift, and therefore, out of two varieties of any race of animal who are equally endowed in other respects, the most intelligent variety is sure to prevail in the battle of life.[56]

As an example of the difference in intellectual ability between populations Galton compared English men and the 'negro race'. He claimed that even apart from social hindrances there was a difference of two grades

of ability between them. But even negroes were not at the bottom of the scale of intellectual ability— Australian Aborigines were, he said, a grade below them.[57] His virulently racist and ethnocentric argument was supported by impressionistic evidence gathered on his travels or from the similar writings of others. This was precisely the mode of argumentation prevalent among contributors to the Journal of the Ethnological Society of London.[58] Galton's arguments thus make sense when viewed in the context of mid-Victorian anthropology.

It is thus of particular importance to recognize that Galton's early excursions in the subject of mental ability were written from within a tradition of anthropological thought which was full of assertions of the biological, moral and intellectual inequality of races. From the inequality of races it was but a short step for Galton and others to encompass differences within populations in their framework.[59] Although many of Galton's ideas were unfamiliar, strange and perhaps disturbing to the majority of the reading public they would have made sense to that section of the scientific sub-culture of mid-Victorian Britain constituted by the anthropological community.

Ability and Mental Labour

In this section I want to demonstrate a further, more subtle, way in which Galton's image of human nature was constituted, by drawing out some particular shared perceptions and values 'inside' and 'outside' science.

In Hereditary Genius Galton defined ability thus:

> By natural ability I mean those qualities of intellect and disposition which urge and qualify a man to perform acts that lead to reputation. I do not mean capacity without zeal, nor zeal without capacity, nor even a combination of both of them, without an adequate power of doing a great deal of very laborious work. But I mean a nature which, when left to itself will, urged by an inherent stimulus climb the path that leads to eminence, and has strength to reach the summit—one which, if hindered or thwarted, will fret and strive until the hindrance is overcome, and it is again free to follow its labour loving instinct.[60]

This illustrates several points about Galton's concept of ability. He saw it fundamentally as being based upon intellectual capacity. Secondly he stressed that it was linked with whether a person could perform large amounts of mental labour. Galton considered both of these, as well as 'zeal', to be inherited qualities. He later elaborated his concept of ability by introducing the concept of 'energy' to denote the capacity to perform labour.

This complex unity of energy and labour was by no means peculiar to Galton; similar views had already been put forward by Alexander Bain. Bain maintained a long-standing interest in intellectual ability and argued that people differed in ability and that these differences were to a degree inborn. On several occasions Bain discussed the reasons for differences in ability. His conceptualization of these differences was a physiological one based upon the concept of 'mental energy'. In On the Study of Character (1861) Bain argued that human beings were endowed with a form of nervous energy - a 'spontaneous tendency to action', which was connected with the operation of the Will. He argued that

> We cannot make a better start in classifying and describing the elements of character, than by taking note of the degrees and varieties of this inborn energy, the manner of its display, and the practical consequences flowing from it.[61]

A person endowed with a large amount of this energy would, he claimed, work harder, persevere longer, be more devoted to active sport and recreation than another person,

> If in trade he will do a greater amount of business, if in handicraft he will execute more work, if in statesmanship he will push his advantages further and resist hostile parties more strenuously.[62]

Bain's approach here forms part of his wider approach to psychological issues in that he sought to situate psychological phenomena within physiology.

The view that people possessed varying quantities of a form of energy was also propounded by Francis Galton in Inquiries Into Human Faculty (1883); he wrote that

> Energy is the capacity for labour. It is consistent with all the robust virtues, and makes a large practice of them possible. It is the measure of fullness of life; the more energy the more abundance of it; no energy at all is death; idiots are feeble and listless.[63]

It is, as I argue below, of central importance to recognize that both Galton and Bain linked ability in some way to the efficiency with which mental labour could be performed. We should try to understand this emphasis on mental labour and the willingness or ability to apply oneself to perform it, within the context of the ideology of work and labour expressed by middle class Victorians.

Nowhere was the ideology of work and the code of moral exhortation put in a clearer form, or more succinctly and eloquently argued than in Samuel Smiles' Self Help. Published in the same year as Darwin's Origin, Smiles' work easily outsold it, at the end of its year of publication it had sold 20,000 copies, by the end of 5 years 55,000, by 1889 150,000 and by the end of the century almost quarter of a million.[64] Smiles' work was, however, only the most prominent of many publications which set out the same message of 'self improvement' and a rhetoric of moral exhortation. There were many books written in the 1850s whose authors were as keen as Smiles to give healthy lessons to a rising generation. Periodicals such as Knight's Penny Magazine and Chambers Journal also expressed the same message and had a powerful appeal to the reading public.[65]

In Self Help Smiles set out to propound the values of prudence, industry and perseverence which he thought necessary for individuals to be happier and more successful in life. He also attacked behaviour such as gambling, intemperance, fraud and absenteeism, which he despised. Smiles' book is a blend of exhortation and teaching by example.

Interspersed with passages summarising wholesome virtues is anecdote after anecdote illustrating their utility. Statesmen, scientists, engineers and artists are all produced in support of his case. Smiles argued that

> ... human character is moulded by a thousand subtle influences, by example and precepts; by life and literature; by friends and neighbours, by the world we live in as well as by the spirits of our forefathers, whose legacy of good works and deeds we inherit. But great, unquestionably though these influences are acknowledged to be, it is nevertheless equally clear that men must necessarily be the active agents of their own wellbeing and well doing...they themselves must in the very nature of things be their own helpers.[66]

Within Smiles' world of self reliance it was not mere accident that some people got on in the world. This occurred because some possessed 'purpose and persistent industry'.[67] It seemed plainly obvious to Smiles that the way in which men raised themselves through the social structure was by means of their own hard work. After all, were there not innumerable examples of men who had done so?:

> The instance of men...who by dint of persevering application and energy, have raised themselves from the humblest ranks of industry to eminent positions of usefulness and influence in society, are indeed so numerous that they have long ceased to be regarded as exceptional.[68]

One of the key qualities which Smiles deemed essential to character was 'energy'. He wrote that

> Energy enables a man to force his way through irksome drudgery and dry details and carries him onward and upward in every station in life...It is no eminent talent that is required to ensure success in any pursuit, so much as purpose — not merely the power to achieve, but the will to labour energetically and perseveringly. Hence energy of will may be defined to be the very central power of character in a man...[69]

Smiles' enthusiasm with 'energy' was shared by other Victorian commentators and authors from Thomas Hughes in Tom Brown's Schooldays to J. S. Mill's Essay on Liberty.[70]

Smiles' perception of self improvement and of 'getting on in

life', coupled with the concept of energy brings us back to Bain and Galton. In On the Study of Character Bain wrote that the mere abundance of 'natural energy' was no guarantee of its profitable employment — application, the will to labour, was also necessary. Further,

> spontaneous energy, besides implying industry and activity in pursuits, is one foundation of the qualities of endurance, Patience, Courage, and Self Reliance.[71]

This view forms part of the wider Victorian gospel of work promulgated by Smiles and others. Bain believed that when people were refreshed by rest, nutrition, and good health, then:

> Every day of our life there is a certain amount of this natural overflow, which may either be run to waste or be turned to account in the avocations of industry.[72]

The theorising of Bain as regards individual differences was constructed within a framework of viewing labour, social mobility and ability shared in many respects with Smiles and others.

This outlook which Bain shared with Smiles is also clearly distinguishable in Galton's writings. Like Smiles, Galton held successful people in high esteem. Indeed, his Hereditary Genius bears some similarities to Smiles' book, in that it contains similar types of anecdotes of the ability or circumstances of 'great men'. Galton thought successful men possessed high powers of work, endurance and application. He argued that

> It is a great and common mistake to suppose that high intellectual powers are commonly associated with puny frames and small physical strength. Men of remarkable eminence are almost always men of vast powers of work. Those among them that have fallen into sedentary ways will frequently astonish their friends by their physical feats...Most great men are vigorous animals, with exhuberant powers.[73]

Characteristically Galton supported this observation with an anecdote from his own experience, claiming that at Cambridge University the top six men in his year in Classics and Mathematics had great physical powers.

It is important to recognize the differences in the ideology of Smiles and that of Galton and Bain. In Smiles' ideal world people would succeed in life by will power and self improvement. Galton, and to a certain extent Bain, believed that successful people possessed a great deal of 'energy' (both physical and mental) which was in some degree inborn. Perhaps the best way to understand the situation is by arguing that Galton and Bain transformed the ideology propounded by Smiles and others; they reinterpreted it within the terms of their hereditarian, meritocratic social philosophy. Galton's view of ability and energy, and his adherence to aspects of Smiles' cosmology, is well illustrated in the draft he wrote for Hereditary Genius.[74] Here he proceeded on the assumption that people possessed varying amounts of inborn energy, claiming for example that

> Education (I use the word in its largest sense) will develop some faculties at the cost of the rest the total mental energy being perhaps but little altered.[75]

He also, however, worked within a Smilesian framework and adhered to a belief in the benefits of the qualities of perseverance and application. He argued that:

> The amount of work that a man accomplishes in his lifetime and therefore the reputation he leaves behind him, depend a good deal on the skill with which he applies his labour, and one important effect of a good education is to teach him to work to the best advantage. Uneducated people waste their energies...[76]

The section from which this quotation is taken is revealingly headed "The Most Productive Kinds of Mental Labour".

In order to illustrate his discussion of mental labour Galton used the example of what he termed Euler's Law of the most effective mechanical labour.[77] He explained that Euler's Law involved an analysis of the most efficient way, in terms of weight carried and speed pushed of, for example, moving a pile of earth in a wheelbarrow. For maximum efficiency Euler's Law stated that the labourer should carry two ninths of the maximum possible weight at one third the greatest speed he could

manage. Galton now claimed that there was:

> Considerable analogy between the action of nervous energy in the forms of thought and in the forms of force...I see no reason to doubt and many to believe that the law of the inverse square of velocity is just as true for the intellectual as it is for the muscular efforts and, if so, Euler's Law would apply to mental labour.
>
> We unfortunately possess no dynonometer for measuring brain work and it is therefore quite impossible to know with precision whether our mental efforts are subordinate to this law.[78]

Galton expanded his view of 'energy' and by 1874 could write:

> When energy, or the secretion of nervous force is small, the powers of the man are overtaxed by his daily duties, his health gives way, and he is soon weeded out of existence by the process of natural selection; when moderate, it just suffices for the duties and ordinary amusements of his life...when it is large he has a surplus to get rid of, or direct, according to his tastes. It may break out in some illegitimate way, or he may utilise it...[79]

This conception of the channelling of surplus energy was also used by Bain. Both adhered to a 'physiological' conception of ability in which a central role was played by a kind of mental or nervous energy which could be channelled or directed according to whether the person possessed perseverance or the 'will to labour'. Galton also viewed this energy as being the product of evolutionary development, arguing that

> Energy is an attribute of the higher races, being favoured beyond all other qualities by natural selection.[80]

It was also pressed into service in his eugenic proposals:

> In any scheme of eugenics, energy is the most important quality to favour; it is...the basis of living action, and it is eminently transmissable by descent.[81]

In its general approach the image of human nature propounded by Galton was a product of the industrial capitalist society in which he lived and of his particular place in its social structure. At a more concrete and specific level his conception of ability as fundamentally involving some form of 'energy' was the result of his perception of his social environment, with its growing division of labour and specialization

of productive functions. He was part of the newly emerging class whose existence depended on mental as opposed to manual labour. It is no surprise that we find Galton discussing ability in these terms, nor of his extrapolation of the term 'efficiency', normally applied to machines or the economic status of a productive process, to an understanding of the nature of mental ability. Thus in his attempt to provide a theory of mental ability Galton drew upon the ideology and rhetoric of many other middle class Victorians. The writings of Galton, Bain, Smiles and others formed part of a shared context of understanding, a preferred way of viewing the natural and social world, although as I have argued their particular interests resulted in different employments of similar themes according to their varying aims and interests.

The Measurement of Mind

During the 1870s Galton collected a large amount of data which he hoped would throw light on the nature of heredity.[82] This data principally concerned measurements of the physique of schoolboys and observations on successive generations of peas. While Galton possessed methods by which physique could be elaborately recorded he as yet neither possessed nor could he draw upon existing techniques for comparing intellectual ability. In the mid 1870s, however, Galton set out to remedy this state of affairs.

Galton's first published move towards a method of measuring mental ability directly is contained in the Address which he gave to the Anthropology section of the British Association at Plymouth in 1877, although his investigations into the field of experimental psychology began in 1876.[83] At this time news of the newly emerging science of experimental psychology was beginning to filter over from Germany, although there was as yet no formal psychological laboratory established

either there or in Britain. Interest in the subject in Britain was displayed in the pages of Mind which devoted space in its first volumes to developments in Germany, including a report in the very first volume by James Sully.[84] As Galton's researches progressed through the late 1870s and the 1880s German experimental psychology became increasingly well known in Britain. Although there was no well developed science of individual differences which Galton could draw upon, there was a body of knowledge and practice which provided him with valuable resources. His 1877 Address to the B.A. illustrates this perfectly, and also foreshadows the path which he followed over the next ten years.

The Address falls into two interlinked sections both of which form part of his larger strategy of devising means of differentiating the 'fit' and 'unfit'. He ended his talk by stating that

> There can be no more interesting subject to us than the quality of the stock of our countrymen and of the human race generally, and there can be no more worthy inquiry than that which leads us to an explanation of the conditions under which it deteriorates or improves.[85]

The first part dealt with the measurement of 'mental characters' and the second techniques of 'composite portraiture'. His aim was to investigate the means by which people could be classified according to their mental character. His initial purpose was to bring to the attention of his audience that it had recently become possible

> to pursue an inquiry into certain fundamental qualities of the mind by the aid of exact measurements.[86]

The scientific developments to which he was referring was the great amount of research which had recently been undertaken in Germany in psychophysics. Psychophysics was the subject which formed the kernel of the work of the first experimental psychologists. It was as Galton put it "the science of subjecting mental processes to physical measurements and to physical laws".[87] Psychophysical methods were developed by Gustav Fechner in Leipzig in the 1850s, culminating in the publication

of his seminal Elemente der Psychophysik in 1860.[88] Fechner had postulated that an arithmetic series of mental intensities might correspond to a geometric series of physical energies. The classical experiments which Fechner developed involved the observer judging weight differences, visual brightness, and tactile sensations. These experiments involved measuring phenomena such as the least noticeable difference and the thresholds of sensation. In ensuing years Fechner's work was extensively developed by Helmholtz, Wundt, and Delboeuf among others.

Galton was well aware of developments in Germany at the time he gave his address and mentioned in particular the work of Fechner.[89] One of the main points which he wished to stress was that

> the very foundations of the differences between the mental qualities of men admit of being gauged by a scale of inches and a clock.[90]

At the outset of his interest in experimental psychology Galton looked to the new discipline to provide a means of scientifically differentiating between people. As an example of the type of research which he wished to see pursued Galton discussed what was known as the personal equation. This concept had been developed in the first decades of the nineteenth century by astronomers who were concerned about differing measurements of the time for stellar transits by different observers.[91] The question of the physiological and psychological causes of the personal equation were extensively investigated by researchers in Germany during the following decades, particularly in the 1860s-70s. It was argued by, among others, Wundt and F. C. Donders, that the personal equation was a manifestation of the phenomena of reaction time.[92] It is important to note that experimental psychologists in Germany, such as Wundt, were not primarily interested in the phenomena of individual differences as such, but investigated them within the framework of an attempt to formulate fundamental laws of the mind.[93]

In contrast, the most important point for Galton regarding reaction times was that they exhibited the existence of individual differences.

Galton argued that the magnitude of the personal equation indicated a "very fundamental peculiarity of constitution" which remained constant over many years. He suggested that a comparison was made of the age, height, colour of hair and eyes, and temperament of each person whose reaction time was tested in order that one could investigate whether mental characteristics are correlated with physical ones.[94] It is evident that at this time he had more than a passing acquaintance with developments in German psychology. The importance of this address to an understanding of Galton's work lies in it representing his initial speculations concerning the possibility of differentiating people by means of psychological measurement.

Galton's first published research in experimental psychology dealt with word association.[95] Here he wrote that his main object was

> to show that the whole range of these associated ideas, though they are for the most part exceedingly fleeting and obscure, and barely cross the threshold of our consciousness, may be seized, dragged into daylight and recorded.[96]

This paper drew heavily upon the dominant 'school' of British psychology — associationism.[97] Galton argued that thought processes fall into two categories. First, ideas present themselves by association either with some object newly perceived by the senses or with previous ideas. Secondly, the associated ideas which are 'fixed' by the 'attention' are those most relevant to the topic with which the mind is dealing. Part of his aim was to demonstrate how the association of ideas could be recorded. He considered that he had overcome the difficulties inherent in recording the operation of the mind by allowing thoughts to flow freely for a short while and then suddenly to turn the attention to the ideas present and record their exact nature. He then devised a

method by which he could subject associations to statistical analysis. This involved writing lists of words on sheets of paper, shuffling them, glancing at them one at a time and recording the time taken for two associated ideas to emerge. At first sight this paper may seem to be only very vaguely connected with the topic of mental ability. Its importance lies in the fact that it was Galton's first published attempt to devise a way of investigating the mind in a quantitative manner. He wrote that

> Psychometry...means the art of imposing measurement and number upon operations of the mind, as in the practice of determining the reaction time of different persons.[98]

Further, although the results of his experiment

> may not be of any great novelty or importance...they are at least definite, and admit of verification...until the phenomena of any branch of knowledge have been subjected to measurement and number, it cannot assume the dignity and status of a science.[99]

Galton continued this exploratory work by publishing a paper the following year entitled 'The Statistics of Mental Imagery'. He wrote that

> The larger object of my inquiry is to elicit facts that shall define the natural varieties of mental disposition in the two sexes, and in different races, and afford trustworthy data as to the relative frequency with which different faculties are inherited in different degrees.[100]

In the paper he sought to investigate the varying degrees of vividness with which people could recall familiar scenes in the form of mental pictures or images. His method was to circulate a questionnaire entitled "Questions on Visualizing and Other Allied Faculties" which he distributed to relatives, friends, and to several schools.[101] In assessing his results Galton used his 'statistics of Intercomparison', comparing the various groups in his sample on this basis.[102] The main conclusion which Galton drew was:

> I trust...that what has been adduced is enough to give a fair knowledge of the variability of the visualizing faculty in the English male sex, and I hope that the

> examples of the use of my "statistics of Intercomparison" will convince psychologists that the relative development of various mental qualities in different races admits of being pretty accurately defined.[103]

Here then is the significance of this work to the construction of a means of investigating mental ability. In order to provide evidence for his eugenic programme Galton had to demonstrate that mental traits were inherited and that people could be differentiated according to them. In order to achieve this aim Galton investigated the nature and operation of the mind.

During the late 1870s Galton had made a deep and sustained study of the published work of the 'new' German experimental psychology. By at least 1880 he had read Fechner's Psychophysik and some work of Wundt's.[104] During this period he also read Bain's Senses and the Intellect,[105] his Mental and Moral Science, and On the Study of Character.[106] He also read widely in Continental, mainly German work, including Exner, Donders, and Delboeuf.[107] The notes he took from these authors are extensive and suggest a deep interest in the subject. By November 1877 Galton had done enough work, and was interested enough, to propose writing a book for Kegan Paul and Company entitled Psychometry, or the Measurement of Mental Action in Time and Quantity.[108] At this time, however, he considered that he had much more work to do before he had sufficient material and knowledge to produce a book.[109] This project was finally abandoned in 1879 by which time he had such a mass of material that he did not know what to do with it:

> I wrote to Kegan Paul not to count more upon me, as I did not see my way to writing a good book —the subject was not fit for it — the net results were so full, and the gross so bulky.[110]

A reading of the notes which Galton made from the books and articles he was reading at this time enables us to gain an insight into the specific sources which he drew upon in constructing methods of

measuring ability. From an article by Exner in the German journal Pflugger's Archiv, entitled "Experimentelle Untersuchung der Einfachsten Psychisch∩Prozessen" (1873), he gained a knowledge of the history of the personal equation, of methods for measuring reaction time and the method of least differences used in sensory discrimination experiments.[111] A reading of some work of F.C. Donders provided him with information on reaction time, methods of its measurement and the theory developed to account for it.[112] The work of Hirsch provided him with material detailing the use of the Hipp Chronoscope and on the effects of attention on reaction time.[113] A reading of this and other material provided Galton with a pool of resources with which to develop techniques by which mental ability could be measured.[114]

During the late 1870s Galton also came into contact with the small group of people in Britain interested in experimental psychology. The psychologist to whom he was closest was Croom Robertson. Galton's friendship with him began in 1876 when Robertson, editor of Mind, wrote thanking Galton for sending him some papers on heredity and asking him to contribute to the journal. This friendship lasted until Croom Robertson's death in 1892.[115] Croom Robertson aided Galton to a significant extent with his investigations in psychophysics. In Mind in 1879 he presented a short paper reviewing and praising Galton's work on word association and "Generic Images", writing that

> Mr. Francis Galton has lately published the results of two original psychological investigations, which are of great interest in themselves and admirable specimens of that kind of positive experimental inquiry to which the phenomena of mind can be subjected in only a less degree than the phenomena of nature...It is hoped that Mr.Galton will continue to work in a vein which his psychological tact renders so fruitful of results.[116]

Galton rapidly became a respected figure within the small group of people in Britain who were interested in experimental psychology. This group included Robertson, James Ward and James Sully.[117]

Galton's psychological writings did not, however, pass wholly uncriticized. In the 1880 volume of Mind Bain contributed an article which discussed Galton's experiments in 'Mental Imagery'.[118] Bain praised Galton's "laborious and interesting observations" and welcomed what he saw as his attempt to extend the methods of the physical sciences to the human mind. Bain did, however, complain that Galton had not paid enough attention to the implications of his research for knowledge of "laws of the mind" and that the questions which he had asked were too narrow. He also argued that Galton had not gone far enough in discussing individual differences and that he was content with classing and summing up his results in very general terms. In contrast Bain argued that

> certain individuals A, B, C, have a great or small visualizing memory, is an important fact as regards them; it determines their aptitude or inaptitude for certain vocations, invoking the energetic display of this faculty...Could we...devise an easier and more precise mode of ascertaining and expressing this aptitude, we should do a great work, whose outgoings would be both practical and scientific. Further, if we applied a satisfactory method of measurement to large numbers, representative of entire populations, we should gain a most valuable estimate of the capabilities of men generally for particular walks, and avoid many practical errors of misplaced speculations...[119]

This concern of Bain's for individual differences in mental ability, methods by which people could be graded and slotted into their proper place within the social division of labour is of course familiar. I argued earlier that for some thirty years previous to this he had been expressing similar views. In the same paper Bain proposed a specific 'test' of intellectual ability:

> Someone ought to devise an easily worked apparatus for testing shades of colour discrimination. A spectrum very finely graded might serve the purpose; the test being the number of distinct shades that each person could count. Detached colour specimens could be taken as a check, the subject of the experiment being asked to sort and arrange them by agreements and differences. As a point of intellectual character this is fundamental.[120]

This was precisely the type of test which, as I argue below, Galton

presented to the public four years later. It is, however, clear from Galton's manuscripts that he had already embarked on this course.

Galton's method of testing a person's intellectual ability rested upon how well they could discriminate sensory stimuli. In Inquiries into Human Faculty (1883) he clearly stated how tests of sensory discrimination could provide a measure of a person's mental ability:

> The only information that reaches us concerning outward events appears to pass through the avenue of our senses; and the more perceptive the senses are of difference, the larger is the field upon which our judgement and intelligence can act. Sensation mounts through a series of grades of "just perceptible differences".

As evidence of this he referred to tests which he had made at Earlswood Asylum, writing that

> The discriminative capacity of idiots is curiously low, they hardly distinguish between heat and cold, and their sense of pain is so obtuse that some of the more idiotic seem hardly to know what it is.[122]

He considered that tests he had undertaken proved the "reasonable expectation" that sensitivity was highest among the most able and also that men have more discriminative powers than women.[123] This perceived link between sensory discrimination and mental ability is familiar from the work of Bain. In 1877 he had written that

> Mind starts from discrimination. The consciousness of difference is the beginning of every intellectual exercise ...our intelligence is...absolutely limited by our power of discrimination...If, from the beginning one man can interpolate five shades of discrimination of colour where another can feel but one transition, the careers of the two men are foreshadowed and will be widely apart.[124]

By the time Galton attempted to devise means of testing mental ability Bain had published several works in which he had discussed this theme. In reading through the psychological literature in his search for relevant works Galton had studied several works of Bain, reading his Senses and the Intellect, Mental and Moral Science, and On the Study of Character.[125] It is therefore reasonable to conclude that the link which Galton made

between sensory discrimination and mental ability was one which he had formulated through a study of the work of Bain.

Galton began his own experiments to devise tests of ability by investigating reaction time, attempting to construct an instrument as early as January 1878.[126] A few years later he had begun investigating muscular discrimination, in the form of the discrimination of weight difference. In November 1882 he read a paper describing his experiments in this area to the Anthropological Institute. These experiments were based on the work of the German psychologist E. H. Weber.[127] Galton stressed how his method could be used to investigate individual mental differences and argued that the tests confirmed the suspicion that sensitivity to weight differences was greatest among those most intellectually able.[128]

In 1883 Galton again sought the help of British psychologists and in February of that year James Sully wrote to Galton saying

> I am very glad that you are working at anthropometric psychology. I am convinced that much may be done in this direction, and exact results are really needed for the proper working out of the theory of education.[129]

In March of the same year Galton privately published a pamphlet which he sent to psychologists and anyone else who might be interested. Here he wrote:

> I am endeavouring to compile a list of instruments suitable for the outfit of an anthropometric laboratory, especially those for testing and measuring the efficiency of various mental and bodily powers. The simplest instruments and methods for adequately determining the delicacy of several senses are now under discussion. After these shall have been disposed of, the next step will be to consider the methods of measuring the quickness and accuracy of the Higher Mental Processes. Any information you can give, or suggestions that you can make, will be thankfully accepted.[130]

In the pamphlet he gave details of the type of measurements which he thought necessary with regard to skin sensations, temperature, touch, sight, hearing, smell, taste and the 'muscular sensation'. Croom Robertson aided Galton in writing this pamphlet.[131] In January 1884

he appealed once more for help in his project, this time to James Ward. Galton wrote to Ward:

> I have undertaken to arrange and exhibit at the large forthcoming Health Exhibition a suitable outfit for an anthropometric laboratory. Its object would be to afford a means of defining and measuring personal peculiarities of Form and Faculty, more especially to test whether any given person, regarded as a human machine, was at the time of the trial more or less effective than others of the same age and sex. Again, to show by means of testings repeated at intervals during life, whether the rate of his development and decay was normal...Have you any special apparatus that you would allow me to exhibit in your name?...I should be most grateful for any hints.[132]

This also serves to illustrate once more Galton's image of people as 'human machines' which could be studied, subjected to close measurement and whose 'efficiency' could be measured. Ward replied to Galton:

> I regard you as a public benefactor and I only wish I could be of more use to you. For some time I have been intending to get together some psychophysical apparatus but the difficulty has been to get the money. ...One of the first things I meant to do was to write to you and ask to be allowed to see some of your apparatus...I expect you know a great deal more about the whole thing than I do. I may, however, mention two or three books and papers in which apparatus has been described.[133]

Ward then provided Galton with a list of works he could consult, under the headings of sight, hearing, touch, smell, reaction time and higher mental processes. All except one article were German works. Thus by the 1880s Galton was well acquainted with the theory and practice prevalent in German experimental psychology. At this time one reviewer of Galton's Inquiries into Human Faculty could write:

> By these special inquiries Mr. Galton has transplanted to these shores the quantitative methods of physiological psychology which distinguish the German schools of Fechner and Wundt. He has established by his example and initiation the science of psychometry, and pointed to the line of inquiry on which the scientific portions of psychology can alone become scientific.[134]

Anthropometry and Urban Degeneration

In the particular social and economic context in which Galton worked in the 1870s and 1880s conceptions of mental ability or 'fitness' were not wholly separated from questions of physical fitness or ability. Galton and others possessed a conception of 'fitness' centred on a person as a whole: how well and where they could fit into the division of labour or whether they should have a place in a future society at all. It is this wider context I now discuss.

Of all the social problems faced by middle class Victorians the perception that society was rapidly differentiating into classes separate from and hostile to each other was felt to be the most fundamental. Perhaps their most prominent concern was their image of the poor, the destitute, as a group who might one day rise up in revolt against the established order.[135] This concern followed the rapid unplanned growth of industrial towns, the rising numbers employed in urban factories and the squalor and misery which were part of these changes. Throughout the Victorian period politicians, social reformers, statistical societies, Royal Commissions and philanthropists were actively gathering information to answer the question 'what is the actual condition of society?' Concern with the nature of daily life in this new and strange industrial society was widespread. Readers of novels such as Charles Dickens' Hard Times (1854) and Elizabeth Gaskell's North and South (1855) or Mary Barton (1848) will be familiar with the deep interest and concern expressed by middle class observers in the state of society.[136] Attempts to ascertain the impact of factory and urban life on the health, physique and morality of the working class were widespread. One method employed for this purpose was anthropometry.

In the early nineteenth century a new tradition in the study of human physique, anthropometry was developed. This was born of the reaction of humanitarians to the appalling conditions of the poor and

their children. It was increasingly used by proponents of factory legislation, Poor Law Commissions and supporters of Sanitation and Housing Acts.[137] There was also a less humanitarian interest in human physical development. As a result of wars, famine and epidemics, politicians in Europe as a whole became preoccupied with the question of the physical fitness of their army recruits. Through the results of the census, authorities were appalled to discover how many men were consumptive and crippled.[138]

One of the first official investigations in Britain was the Report of the Commissioners on the Employment of Children in Factories (1833). Measurements were taken on the Commission's behalf of children in Manchester, Stockport and Leeds in order to investigate whether there was a difference between those children employed in a factory, or whose parents were employed in a factory, and those who were not. Many of these investigations were undertaken by Leonard Horner, one of four Factory Inspectors. His survey of 1831 was the first large-scale survey of the vital statistics of children.[139] State intervention on this question continued during the following decades. In 1872 a parliamentary commission was established to inquire into the conditions of work of women and children in textile factories. Evidence was taken from employees, employers and company doctors. The scope of the commission was wider than its initial brief might suggest. In addition to taking verbal evidence the commission instituted

> a careful and systematic examination of children upon an extensive scale, in a great variety of areas...registering their height, weight, and dimensions of the chest and recording all instances of malformation or disease... Our object was to compare and contrast children employed in factories, first with children inhabiting factory districts but not employed in factories, secondly with children from adjacent districts where no factories were situated. It was also necessary to distinguish between factories in large towns and those in suburban or semi-rural districts, to meet the obvious objections that whatever results were observed might be attributable to the child's locality rather than to its occupation.[140]

Five doctors were employed to take the measurements and during the winter of 1872-73 they visited a large number of schools in Lancashire, Cheshire and the West Riding of Yorkshire, examining nearly 1,000 children. They found that children who worked in urban factories were smaller and lighter than those living in non-factory rural or suburban districts. It was also found that the same factory children were smaller than those living in factory towns but neither working in factories themselves, or having parents who worked there. This implied that it was the social environment which acccompanied factory work which was the important differentiating factor.[141]

In the 1880s this concern for the state of the working class and, in particular, the poor, took a particular form in a specific social and economic situation. The failure of past attempts at charitable reform, the existence of an economic crisis in large cities, especially London, and the impact of tracts such as Andrew Mearns' Bitter Cry of Outcast London (1883) served to direct middle class reformers to consider more closely the situation of the urban poor. The main explanation developed to account for the state of the poor, the ill, the unemployed slum dweller, was the theory of urban degeneration.[142] This theory suggested that at the root of the condition of the poorer sections of the working class lay the pressure and degenerating environment of urban life. It was held to be the case that the progressive migration of people from the country to the city which had been accelerating with the development of industrial capitalism would result in the progressive deterioration of the 'race'. For example, the economist Alfred Marshall wrote that as long as the poor continued their present life in the cities

> they will go on deteriorating; and as to their children, the more of them grow up to manhood, the lower will be the average physique and average mortality of the coming generation.[143]

Social Darwinism added a cosmic significance to the 'struggle' between

country and city. A biologistic framework provided a comprehensive theory of urban degeneration which received widespread middle class support and was given backing by the social investigators Booth, Alfred Marshall and Llewellyn Smith.

It is as part of this concern for the state of the poor, about whether deterioration was taking place, about the possibility that the Nation was in decline, that Galton's investigations of mental ability and physical state in the 1870s and 1880s should be considered. In 1873 Galton addressed an audience at the Anthropological Institute on a "Proposal to Apply for Anthropological Statistics from Schools".[144] He bemoaned the fact that not enough was known about the physical qualities of the people of Britain, considering this to be a question of enormous importance:

> We do not know whether the general physique of the nation remains year after year at the same level, or whether it is distinctly deteriorating or advancing in any respects. Still less are we able to ascertain how we stand at this moment in comparison with other nations, because the necessary statistical facts are...as deficient with them as with ourselves.[145]

He suggested that the best method of obtaining a general picture of the physique of the nation would be to collect measurements of school-children. He proposed gathering statistics of height, weight and age, and included in his paper a sample form on which results could be recorded. In the following years this appeal bore fruit on several occasions.

Galton's interest in the 'condition of England' had existed since at least the time of Hereditary Genius where he wrote that

> It is perfectly distressing to one to witness the draggled, drudged, mean look of the mass of individuals, especially of the women, that one meets on the streets of London and other purely English towns. The conditions of their life seem too hard for their constitutions, and to be crushing them into degeneracy.[146]

This concern intensified during the following decades, paralleling an increasing concern on the part of middle class observers as a whole.

In 1873 Galton read a paper to the Statistical Society in which he presented an estimate of the relative fertility of people living in urban and rural areas.[147] He believed that those living in towns were deteriorating and when he coupled this with the belief that the more able people from rural areas were migrating to the cities his concern was sharpened since this implied a progressive deterioration of the 'race'. Galton firmly and fundamentally believed that it was the duty of those who were more able to have more children in order to improve the average quality of the race. Yet here was a situation in which deterioration was taking place. He began his paper by stating that

> It is well known that the population of towns decays, and has to be recruited by immigrants from the country, but I am not aware that any statistical investigation has yet been attempted of the rate of its decay. The more energetic members of our race, whose breed is the most valuable to our nation, are attracted from the country to our towns. If residence in towns seriously interferes with the maintenance of their stock, we should expect the breed of Englishmen to steadily deteriorate, so far as that particular influence is concerned.[148]

To estimate the relative fertility of these groups he used the 1871 census for Coventry and Warwickshire. The implications of his results were that for the same size population more children were born in rural rather than urban areas, which he interpreted to mean that the average state of the population was declining.

By the following year Galton had received two replies to his appeal to the Anthropological Institute for statistics from schools. These came from Marlborough School and Liverpool College. The former was facilitated by the Headmaster, W. F. Farrar, who had been interested in anthropology for some time, having joined the Ethnological Society of London in 1861.[149] Measurements on 150 boys at the school were taken by Dr. Fergus, the medical officer and Mr. Rodwell, the natural science master. The results were published in the Journal of the Anthropological Institute along with an analysis by Galton.[150] Measurements

were taken of height, weight, chest size, girth of flexed arm, girth of calf and circumference of head. The authors felt that the latter was a deficient measurement and stressed that until head measurements embraced three dimensions little information could be gained about the relationship between head size and 'intellectual vigour'.[151] In his appended paper Galton explained that he had made several trial attempts to collect statistics on these questions as a prelude to a larger scale investigation. His aim was to gather

> information for the purpose of intercomparison, on the growth of Englishmen living under different conditions of town and country, and belonging to different ranks of society.[152]

He calculated the mean heights and weights of the schoolboys and claimed to show that the data conformed to the 'law of the frequency of error'. This was really an exercise calculated to convince his audience and any interested schoolmasters, of the value of the anthropometric data which could be collected from schools. He wrote

> I believe...that when we have returns from 4 or 5 schools of equal size to Marlborough, containing boys of the same classes of society, and antecedents generally, that we shall have sufficient material to enable us to establish with certainty the law of growth of the English boys of the present date, who are sons of professional men and clergymen, and who are educated in the country, and reared on the present system of diet and physical and mental work. This will be a standard of comparison for future periods, and also for other countries and to different conditions of life.[153]

In May 1876 Galton presented more data of heights and weights to the Anthropological Institute, this time from nine schools - Marlborough, Clifton, Haileybury, Wellington, Eton — all situated in country areas, and City of London School, Christ's Hospital, King Edwards School and Liverpool College, all in urban areas.[154] He argued that boys from country schools were over an inch taller than those from urban schools and also about seven pounds heavier. He claimed that the difference between the two groups was a result of poor nutrition, environment and

town life of the urban children's parents and ancestors.[155] Thus, he had evidence that people living in towns were in a state of slow degeneration, a finding which confirmed the worst suspicions of Galton and others.

This anxiety was felt by many middle class people, for example, four years previously the Metropolitan Poor Law Inspector considered that

> it is well established that no town bred boys of the poorer classes especially those reared in London ever, except in very rare instances, attain the above development of form (4 ft. 10½in. and a 29in. chest) at the age of 15. A stunted growth is characteristic of the race.[156]

This view gained growing support during the late 1870s and 1880s.[157] This concern also met with a response by anthropologists who had formerly confined their gaze to the peoples of Britain's colonial possessions and now turned inward to investigate the inhabitants of their own country. Perhaps the anthropologist who followed this line of inquiry most fully was John Beddoe.[158] In 1869 Beddoe published the results of a very long and painstaking investigation 'On the Stature and Bulk of Man in the British Isles'.[159] Beddoe circulated a questionnaire asking for details of surname, age, place of birth, height, weight, colour of eyes and hair. He collected statistics from over 18,000 people from a wide range of sources such as prisons, asylums, the army and even from a whole village in Scotland.

Beddoe had three aims in this study. First to obtain a reliable picture of the physique of the British population in respect of its 'several races' and to provide standards for future observers who might be interested in the physical state of the British people.[160] Second, to estimate the proportion of 'serviceable' young men who could not be accepted for the army because of regulations about stature. This subject was considered to be of national importance at this time, a Report of the Parliamentary Commission on Recruiting having recently been published

which drew attention to the poor physical state of recruits.[161] Finally, he set out to investigate how life in cities was affecting people physically. He presented hundreds of pages of tables giving details of the data obtained and discussed and compared differences in height, weight and other characteristics. One of the main claims made by Beddoe was that his returns provided evidence that people in towns were in a process of degeneration which was hereditary and progressive.[162] He viewed his results from a perspective of a theory of urban degeneration and through a concern about the status and power of Britain. He ended his paper by stating:

> Pending further investigations, I am disposed to think that the facts are best explained by the theory of hereditary and progressive physical degeneration in certain classes of the inhabitants of towns. But, be this as it may, there can hardly...be any question of the great national importance of the whole subject, at a time when the British people is rapidly being transformed from an agricultural into a manufacturing, from a rural to a civic people; when, with an increasingly felt necessity for keeping up our military power, we have an increasing difficulty in obtaining recruits, and when the truth that both the individual and the national body requires physical as well as mental and moral cultivation and development, is becoming more and more distinctly acknowledged...in all ages, since the English became a nation, their position among other nations has been in great measure due to the frequency among them of individuals of great strength and physical energy, and when we as a nation fall below others in this respect we shall suffer for it not merely in our military but in our commercial, and even in our scientific position...whenever a race attains its maximum of physical development it rises highest in energy and moral vigour.[163]

This anthropological approach also found a considerable resonance in more popular writings. The same typologies were used to describe both racial and social inequality and were used interchangeably: 'primitive' people and the working class were viewed from within the same conceptual framework.[164] For example, in his London Labour and London Poor, Henry Mayhew took inspiration from anthropology, writing of the 'settled' or 'migratory' tribes of London and of the 'undiscovered

country of the poor'.[165] This imagery of exploration served to indicate material differences between classes, with references to wandering tribes and 'natives' indicating the lack of stable homes and decent clothing of the poor.[166] This perspective was central to a great deal of the writing about the condition of the poor in London in the 1880s. In 1883 in his sensational How the Poor Lives, George Sims began his report on the poor in London in the following terms:

> I commence...a book of travel. An author and an artist have gone hand in hand into many a far off region of the earth, and the result has been a volume eagerly studied by the stay at home public, anxious to know something of the world in which they live. In these pages I propose to record the results of a journey into a region which lies at our own doors—into a dark continent that is within easy walking distance of the General Post Office. This continent will, I hope, be as interesting as any of these newly explored lands which engage the attention of the Royal Geographical Society—the wild races who inhabit it will, I trust, gain public sympathy as easily as those savage tribes for whose benefit the missionary societies never cease to appeal for funds.[167]

Such attitudes to the working class were widespread and talk of exploring 'region after region' and of the 'dark continent' commonplace, as was the view that the poor were a 'race so oppressed'.[168] There was thus a predisposition on the part of anthropologists and social commentators in the 1870s and 1880s to consider the working class in terms of an anthropology of progress or degeneration.

The task which Beddoe began in measuring the physique of British people was continued in greater depth by the British Association Anthropometric Committee. In 1875 at the Bristol meeting of the B.A. the Council resolved that an anthropometric committee be formed to collect

> observations on the systematic examination of the Heights, Weights and other physical characters of the inhabitants of the British Isles.[169]

The committee was an extremely powerful one and included Beddoe, William Farr and Galton, in addition to several past Presidents of the Anthropological Institute.[170] For the following nine years the committee

laboriously collected statistics and compiled lengthy reports, and by 1883 had collected details of over 53,000 individuals. The work was funded directly by the British Association.[171] Galton was the first Secretary and from 1880-83 Chairman of the Committee and it is evident from its Reports that he was one of the main architects of its work. The Committee gained the cooperation of government officials and inspectors of the army, navy, prisons, factories and pauper schools. Printed questionnaires were issued along with detailed instructions and several small outfits of instruments purchased for use in venues such as prisons where great quantities of data could be gathered.[172] The measurements taken were soon expanded to include strength of arm, lung capacity and later, size and shape of head.[173] By 1879 they had enough data to plot graphs of the height and weight of the English population, dividing them into 'Professional Class', 'Average', 'Labouring and Artisan Class in Towns'. They also included material from the work of the American, Henry Bowditch's 'Growth of Children' (1877-79) and from Charles Roberts' Manual of Anthropometry (1878).[174] Roberts increasingly became a central figure in the Committee, eventually writing much of the Reports, performing many of the necessary calculations and acting as Secretary of the Committee 1879-83.[175]

In the 1880 Report the Committee followed up Galton's work of 1874-76 by presenting results comparing the height and weight of children from urban and rural areas. By 1881 they had broadened their remit to collect information on age, height, weight, birthplace, colour of hair and eyes, chest size, strength of arm and visual acuity. They also felt able to assess the comparative effect of occupation and town and country life on biological development. This latter emerged as one of the Committee's main concerns in its final Report of 1883 where they discussed the subject at some length. By comparing their results with those of the Report of the Factory Commissioners of 1833 and the Report to the Local

Government Board on 'Changes in Hours and Ages of Employment of Children and Young Persons in Textile Factories' of 1873, they concluded that the population of the manufacturing towns was not, as many believed, degenerating.[176] This conclusion was disputed by Galton who claimed that the Committee's figures demonstrated that deterioration was taking place.[177] It is no surprise that Galton disagreed since he had fervently believed in urban degeneration for at least a decade.

The work of the Anthropometric Committee appealed to, and was directed by, several interest groups who in their various ways were concerned about the 'fitness' of people in Britain. Anthropologists such as John Beddoe and Colonel Pitt-Rivers wished to investigate the 'varieties' of the British race.[178] There were also humanitarians like Charles Roberts, who were interested in the Committee's work because they thought that it could make a contribution to providing an assessment of the physical, mental and moral state of workers, especially children, which could be used as evidence in campaigning for restrictive legislation. Another interest group were those concerned with the physical state of army recruits, Beddoe and Pitt-Rivers being particularly active in this area.[179]

Galton's interest was kindled by the several ways in which he thought the Committee could be of value to him. Like other members of the Committee Galton was interested in the contribution it could make to anthropology and a knowledge about the state of the nation's physique. In addition, however, he had a further interest in its work; it could provide evidence which might shore up his case for the introduction of eugenic policies. Galton's work with the Anthropometric Committee formed part of his wider project of investigating mental and physical 'fitness' and ways of measuring it.

The Anthropometric Laboratory

In early 1884 Francis Galton opened an Anthropometric Laboratory to the public at the International Health Exhibition then being held in South Kensington Museum. In a fenced off area measuring 36 feet by 6 feet and crammed with instruments, the Ladies and Gentlemen of London Society could indulge themselves in gaining a knowledge of their physical and mental capacities and fitness, paying three pence for the pleasure. The laboratory remained open within the Exhibition until the following year, before being transferred to another part of the Museum.[180] This laboratory represented a culmination of the research on mental and physical ability which Galton had been pursuing for a decade. Three types of tests were employed in the laboratory: measurements of physique, such as height and weight; of physical abilities, such as strength of squeeze; psychological ones, such as sensory discrimination. Measurements of the first and second type followed directly from Galton's involvement with the British Association Anthropometric Committee. The psychological tests were the outcome of the period Galton spent in the 1870s and 1880s closely following developments in experimental psychology in Germany and of his close liaison with Croom Robertson and other British psychologists.

One of the main aims of Galton in setting up his laboratory was to gather information on heredity. From the anthropometric statistics which Galton had gathered in schools he possessed a picture of a population at a particular point in time. He did not, however, have a means of obtaining the statistics of a population over several generations which was vital for his eugenic plans. To this end he investigated heredity in sweet peas in the hope that this would throw light on human heredity. Ultimately this work led him to the formulation of the correlation coefficient in 1888.[181] But how could he obtain information on two or more generations of people directly? In

1882 he proposed a scheme which he hoped would solve this problem. In an article in the Fortnightly Review Galton argued that there was a need for an institute where parents and their children could be measured, both mentally and physically. He proposed that records could be taken of height, weight, skin colour and so on as well as reaction time and sensory discrimination.[182] The following year he argued that it would be even better if each family kept a record of its abilities, from which a national record could be compiled as well as a medical history of the family.[183] In Inquiries into Human Faculty, published the same year, he asked

> When shall we have anthropometric laboratories, where a man may, when he pleases, get himself and his children weighed, measured, and rightly photographed, and have their bodily faculties tested by the best methods known to modern physical science? The records of growth of numerous persons from childhood to age are required before it can be possible to rightly appraise the effect of external conditions upon development, and records of this kind are at present non-existent.[184]

In December 1883 Galton placed an advertisement in the Fortnightly Review offering prizes of up to £500 for the most complete family records. This was closely followed by Record of Family Faculties published in early 1884. This book contained blank spaces in which a family could record its physical and mental attributes and those of its immediate descendants. In Inquiries Galton had already written that

> The investigation of human eugenics — that is, of conditions under which men of a high type are produced — is at present extremely hampered by the want of full family histories, both medical and general, extending over several generations.[185]

By May 1884 Galton had received 100 replies to his request.[186] The anthropometric laboratory thus provided Galton with another opportunity to gather data relating to human heredity.

At the laboratory a total of 9,337 people were measured in 17 different ways.[187] Measurements were taken of weight, sitting and standing height, armspan, breathing capacity, strength of pull and

squeeze, force of blow, reaction time, keenness of eyesight, discrimination of sounds and the judgement of the length of a line.[188] The wages of two men employed in the laboratory and the cost of the instruments themselves were borne by Galton.[189] After the closure of the International Health Exhibition and the transfer of the laboratory to another part of the Museum it continued in operation for six years with an additional 3,678 people being measured.[190] In February 1891 Galton received notice from Sir Frederic Abel, Secretary of the Imperial Institute of the United Kingdom, the Colonies and India, that the Institute intended to repossess the ground on which the laboratory stood within a matter of days.[191] Space was, however, found to accommodate the laboratory elsewhere in the museum. Galton also displayed his laboratory elsewhere in the country. He transported a version to annual meetings of the British Association in the late 1880s and 1890s, the cost being borne by the B.A.[192] He also exhibited the instruments to the Anthropological Institute on several occasions in order to enlist the help of the audience.[193]

"Heads Cambridge"

Among Galton's papers at University College there lies a small maroon-coloured leather bound notebook entitled "Heads Cambridge". This was used by Galton while working on the results of head measurements taken in the anthropometric laboratory established at Cambridge University in 1884.[194] In this year Galton was invited to give the annual Rede Lecture at Cambridge. The date of the lecture happened to lie a few days before his anthropometric laboratory was due to open in London and he took this as the subject of his talk. He concluded the lecture by stating:

> I am audacious enough to suggest the establishment of at least a plain anthropometric laboratory here in Cambridge. I should consider it one of the best works of my life if the remarks I have the privilege of addressing publicly to this distinguished audience were to lead to the introduction of a new requirement in the

> university, that of a systematic but simple measurement of every undergraduate in his matriculation and again before taking his degree.[195]

Some months afterwards Galton presented a set of anthropometric instruments to a small committee at Cambridge headed by John Venn, lecturer in Moral Science.[196] Galton provided funds for the running of the laboratory, periodically paying the wages of the person in charge.[197] By September 1887 a total of 1,440 students had been measured.[198] When the students presented themselves at the laboratory their name and college were noted, Venn then passed lists of names to relevant college tutors, asking them to sort the students into three classes: "first class men", "remaining honour men", "poll men".[199] The results of each group of students were then compared with each other, with results from Galton's laboratory and an examination made to see if the student's performance altered between the ages 19-24. It was found that the students gained better results as regards height, pull, squeeze, breathing capacity and weight. With respect to the students themselves no major differences were found between the three groups on most measurements, except strength of pull and head size.[200]

The importance of the work of this laboratory to the Galtonian tradition of mental tests was succinctly put by Venn:

> No previous attempt, it is believed, has ever been made to determine by actual statistics the correlation between intellectual and physical capacities.[201]

Throughout the work of the Cambridge laboratory Galton closely collaborated with Venn who always deferred to Galton's expertise.[202] After publishing the results of their initial investigations in Nature and the Journal of the Anthropological Institute, Galton and Venn continued collecting data and published more results, two years later adding another 1000 students to the total. They felt that these findings independently confirmed their first batch of results: that there was no relationship between 'mental superiority' and physical characteristics except in the case of strength

of pull and size of head.[203] This result led Galton to formulate a new use for his tests — they could be used as an adjunct to examinations. He argued that if two candidates for the Civil Service were on a par intellectually (as measured by examination) then the one who was physically superior as measured on Galton's instruments should be selected; 'bodily efficiency' should be taken into consideration in all appointments.[204] Galton made several attempts to have his concept of total fitness (both physical and intellectual) used in picking candidates for the Indian Civil Service, but was ultimately unsuccessful.[205]

The foundation of the Cambridge laboratory provided Galton with the opportunity of investigating a question which had interested him for over a decade. This was the relationship between mental ability and size and shape of head. Galton's interest in this relationship dates from at least 1874 when in English Men of Science he reported that famous scientists possessed heads of a larger circumference than other people.[206] During his studies in the late 1870s Galton read several works on the relationship between ability and head shape and size. Among these were Spurzheim's Physiognomical System (1815) from which he took very extensive notes, Gall's L'orgine des qualities morales (1822) and Bain's critique of phrenology On the Study of Character (1861).[207] Galton had considered, but rejected, measuring heads at his South Kensington laboratory because he thought it would pose practical difficulties. At the beginning of 1885, however, he had the Cambridge Scientific Instrument Company construct instruments for measuring the length, breadth and height of heads, for use in the Cambridge laboratory.[208] In the following year Galton demonstrated his instruments to an audience at the Anthropological Institute. Here he exhibited new instruments made by Horace Darwin's company and outlined what he saw as the difficulties inherent in obtaining such measurements. He told his audience that the point of measuring

heads was

> to show, indirectly, how much and up to what age the brain continues to grow in bulk in different individuals, especially with a view of comparing the uneducated classes with those who are educated. It is well known that the size of caps worn by university students much exceed that of the uneducated population, and it is therefore a matter of much interest to learn both generally and individually at what age the growth of the brain comes to a standstill under different conditions.[209]

While data on head measurements was being collected at Cambridge Galton sought other means of investigating the question. For example, in 1888 he contacted Charles Beevor, a well known doctor, for his advice. Beevor wrote to Galton:

> I have been thinking of the "phrenological" experiments which you prepared...I am afraid that there will not be much chance of arriving at very scientific results unless it were possible to obtain some post mortem examinations of the brain of the congenitally blind.[210]

Galton did not, however, have long to wait for the results from Cambridge, which appeared to show that head size was smallest in "Poll men" and greatest among "First Class Men".[211] This result was confirmed by Venn a few years later.[212] In 1888 in a note attached to a paper by Venn dealing with the Cambridge laboratory Galton presented the results for head measures. Here he assumed that brain size was directly proportional to head size and plotted a graph of head size and age. He was concerned to emphasize that "high honour men" were "precocious and gifted" and that this was related to their brain size, as reflected in their head size.[213] This work on head measurements was subjected to criticism in Nature on the grounds that the measurements were inaccurate because of instrument error, but Galton claimed to be able to evade this by measuring the same person several times and obtaining the probable error.[214] The collection of more data served only to reinforce Galton's belief that a larger head meant a larger brain, and therefore more intellectual ability.[215]

A decade later Galton's confidence in the direct relationship

between head size and mental ability was given a severe blow. At this time the relationship came under close and critical scrutiny by Karl Pearson and Alice Lee at University College. In the mid-1890s Alice Lee, a student of Pearson's, began a study of the relation of skull capacity to intellectual ability. After arriving at a formula for calculating the skull capacity of living people, she obtained head measurements of leading anatomists, members of the British Association, college lecturers and students. It seemed clear to her that the results showed that no significant relationship between head size and intellectual ability existed. Alice Lee had trouble in getting her D.Sc. thesis (of which this work formed part) passed and Galton was called in to investigate the examiners' report.[216] Galton did not believe Alice Lee's results, writing to Pearson:

> As to the skull paper — I find great difficulty in accepting the conclusion that bigness of head is not correlated with power of mind. It entirely contradicts that which I arrived at by measurement of head circumference alone [in English Men of Science].[217]

In 1899 Galton invited Alice Lee to meet him in order to discuss her work. Of this visit Alice Lee wrote to Pearson:

> I saw Mr. Galton this afternoon, he was extremely kind — he said he was sorry that I have concluded skull capacity and brain power are not correlated — he totally disagrees.[218]

Although Galton disagreed with Lee's results, worse was to come when Pearson himself began to investigate the question. Pearson obtained copies of head measurements from Cambridge and set about recalculating the data:

> I have just been dealing with the Cambridge graduates, correlating their degree with the shape and dimensions of their head...so far the relationship between size or shape of head and intellectual ability seems very slight.[219]

Two months later Pearson again wrote to Galton on the subject:

> There is still a chance that extreme genius may exhibit something abnormal in the size of head, but I think it is now pretty clear if we are to look upon ability as

> normally distributed in the population, there is only a small practically negligible correlation between it and either the size or shape of the head.[220]

Galton replied, obviously upset, the following week:

> The non-correlation of ability and size of head continues to puzzle me the more I recall my own measurements and observations of the most eminent men of the day. It was a treat to match the great dome of Sylvester's head. William Spottiswoode was another of the 5 or 6 largest. So was the encyclopaedic physiologist Prof. Sharpey ...However I can say nothing against the validity of your result.[221]

In 1902 and 1906 Pearson published his results in two papers which were to more or less deal the final blow to a belief in the relationship between intelligence and head size or shape.[222] Galton, however, never appears to have publicly rejected his belief in head size as a measure of intelligence.

In the decade after the opening of the laboratories in South Kensington and Cambridge considerable interest was shown in anthropometric laboratories elsewhere in Britain. Eventually, laboratories were established at Eton, King Edward's School in Birmingham, Trinity College, Dublin, Oxford University and the University of Aberdeen.[223] Apart from at Cambridge the most important laboratory outside London was at Trinity College Dublin. This laboratory was organized by the anthropologist Arthur Cort Haddon and D. J. Cunningham, Professor of Anatomy. From its beginning the laboratory was planned with the close cooperation of Galton. In June 1890 Cunningham wrote to Galton:

> A committee consisting of Dr. Haughton, Prof. Haddon and myself, has been formed for the purpose of carrying out in Ireland the anthropometrical work which you have initiated with much marked success in England. A few days ago I brought the matter before the council of the Royal Irish Academy and a grant of £100 was voted to help us in our project.[224]

Together with Haddon, Cunningham planned to set up the laboratory in the Anatomical Museum at Trinity College. He sought Galton's advice and later visited Venn's laboratory in Cambridge to gain some first hand experience of the techniques involved.[225] In February 1891 Cunningham

again wrote to Galton to ask his advice and sent him a proof copy of the schedule of measurements to be undertaken.[226] The laboratory was finally opened on June 26 1891, the instruments having been purchased with a grant from the Royal Irish Academy.[227] Measurements were not only taken in Dublin, for several summers Cunningham, Haddon and Charles Browne spent a great deal of time collecting a large amount of data from all over Ireland.[228]

Haddon and Cunningham both continued their interest in Galton's tests into the late 1890s and 1900s. In March 1898 Haddon left for an expedition to the Torres Straits and New Guinea on which anthropometric and psychological measurements were taken. These tests included reaction time, hearing, sense of smell and taste and muscular sensation.[229] Before leaving, Haddon asked Galton's advice about tests for tactile sensitivity, vision and arm strength and wrote:

> I have had a chat with Dr. Rivers about the possibility of his doing any psychometry — and he said you could best advise on this point. Would you be good enough to see the young chap and give him advice — and if possible a little demonstration.[230]

Thus, this expedition was one means by which the Galtonian tradition was perpetuated.[231]

Cunningham also continued his interest in Galton's tests and became involved in the debate at the turn of the century concerning 'National Efficiency'.[232] In the context of fears about Britain's economic and political status and the poor quality of recruits for the Boer war, an Inter Departmental Committee on Physical Deterioration was established in 1904. The following year a British Association committee published a report 'On the Physical Deterioration of the People and the Utility of an Anthropometric Survey'.[233] This committee was chaired and organized by Cunningham, who then pressed Galton's tests into the service of the state.

The Galtonian Tradition

In the decade following the foundation of the South Kensington laboratory the research begun by Galton was continued and extended by a small group who owed their patronage to him. As a direct result of Galton's strenuous efforts a considerable stimulus was given to experimental psychology in Britain and, in particular, to attempts at constructing reliable methods of measuring mental differences.[234] This group of people shared Galton's general approach to human nature although their individual interests overlay their Galtonian commitments.

In late 1886 at the height of interest in Galton's anthropometric and psychological work a young American fresh from studying with Wundt in Leipzig arrived in Britain. His name was James McKeen Cattell.[235] Cattell had trained in philosophy in the U.S. and in 1880 set sail for Göttingen to study with Lotze and a year later with Wundt in Leipzig.[236] After his return to the U.S. in 1882 he became interested in psychology and returned to Leipzig the following year to study for a doctorate in experimental psychology. Cattell stayed there for three years completing his thesis and finally acting as Wundt's unpaid assistant.[237] For his doctoral studies Cattell concentrated on reaction time and investigated how it was affected by factors such as attention practice and fatigue. He also studied association and the time taken up by simple mental processes such as colour discrimination.[238] Throughout this work Cattell fully subscribed to Wundt's aim of understanding the processes of the mind in general.[239]

While in Leipzig Cattell met with Alexander Bain when the latter visited Wundt's laboratory. Cattell discussed his experiments with Bain and acted as interpreter. Bain urged Cattell to visit Britain and supplied him with letters of introduction to various members of the British scientific community.[240] Cattell paid a short visit to London in 1885, meeting Croom Robertson and the neurologist David Ferrier.

He returned for a longer visit in 1886 after completing his doctorate.[241]

During this second visit Cattell spent a considerable amount of time at Cambridge. He came into close contact with Galton during this time and was very much influenced by him.[242] In 1886 Galton had written praisingly of Cattell's development of a 'gravity chronometer' for reaction time experiments.[243] Cattell visited Galton's laboratory in South Kensington several times and met and corresponded with him on many occasions.[244] For Galton, Cattell's work was of great interest because he had worked directly with Wundt and had developed new experimental techniques which he felt might be useful in measuring mental ability. Galton played a crucial role in channelling Cattell's interest towards individual differences. Before they met Cattell had a very slight interest in how different individuals performed on reaction time experiments in Wundt's laboratory; after their meeting he switched to concentrate on developing a framework for investigating mental differences.[245] This change in Cattell's interest illustrates the fundamental difference in the type of experimental psychology being developed in Germany and that produced under Galton's patronage. The former aimed primarily at gaining knowledge of the laws of the mind in general, and of describing the 'normal' adult male mind, the latter was primarily interested in ways of investigating mental and physical differences. This contrast is crucial and is further illustrated by the work of other members of Galton's circle.

At the meeting of the B.A. in Aberdeen in 1885 a paper was read which pleaded that more attention should be devoted to experimental psychology. Its author was Joseph Jacobs, historian and writer. Jacobs had made a close study of Galton's work and was beginning a large project involving the application of Galton's methods to Jews.[246] In his paper Jacobs argued that Galton's initial psychological studies should be followed by studies in topics such as after images, powers of

observation and linguistic capacity. He wrote that

> If this were systematically affected, it would not be too much to hope that before many years were over, a schoolboy's mental powers could be tested and measured with as much accuracy as his height and weight are now...Education can never be much more than a rule of thumb affair till it can apply psychological principles with a firm conviction of their validity. A boy's progress can only be guessed at nowadays: if...tests could be applied systematically, it could be measured. So too the dread question which is being asked more and more frequently "canst thou minister to a mind diseased?" must wait its answer on the progress of psychological science.[247]

As an example of the type of test which he had in mind he described one dealing with verbal memory. Here he cited the work of Hermann Ebbinghaus in Germany, a report of which had recently been published in Mind. This was a subject which Jacobs devoted some time to investigating during the next few years. He considered that Ebbinghaus's work on verbal memory to be of fundamental importance in developing means of testing mental ability. In a review of Ebbinghaus's book on memory Ueber das Gedächtnis (1885), Jacobs wrote that

> If science be measurement, it must be confessed that psychology is in a bad way. It is true that...psychophysics has already reached the stage where empirical generalizations have been raised into quantitative relations. Hitherto, however, purely psychical phenomena, apart from physical reference, have evaded the skill...of the calculator except in a few sporadic investigations by Mr. Galton and Prof. Wundt... Dr. Ebbinghaus's investigations on memory claim to be the first on any considerable scale in which quantitative relations have been obtained for psychical facts, apart from either physiological concomitants or physical reference.[248]

The investigation of memory held out to Jacobs the hope that it could form the basis of tests of mental ability which could be brought into widespread use in schools:

> May we hope to see the day when school registers will record that such and such a lad possesses 36 British Association units of memory power or when shall we be able to calculate how long a mind of 17 "macauly's" will take to learn Book II of Paradise Lost? If this be visionary, we may at least hope for much of interest and practical utility in the comparison of varying power of different minds which can now at last be laid down to scale.[249]

Jacobs now proceeded to put his ideas into practice by setting out to perform some tests on individual differences in verbal memory. He conducted these with the aid of Galton, James Sully, Carveth Read (Professor of Philosophy at University College) and Sophie Bryant (a mathematics teacher).[250] His method was to ascertain the normal limits of the remembrance of sounds using nonsense syllables similar to those used by Ebbinghaus. The main source of Jacobs' data were tests performed on children at Sophie Bryant's school. Jacobs argued that this test could easily become an addition to "standard" anthropometric inquiries. He termed the number of syllables which a child could remember the "memory span".[251] He found that this increased with age and that one could therefore arrive at an average span for each age. If this were done, then a standard span for various ages could be obtained which, although relative rather than absolute, would still enable one to ascertain whether a boy or girl was above or below the average.[252] Jacobs' test of verbal memory using nonsense syllables was incorporated in the first Binet tests and was still in use as recently as 1958 in the Wechsler Intelligence Scale.[253] Jacobs also investigated the relationship between memory span and the child's place in class examinations. Although the variability of his figures was low he argued that

> So far as high place in form can be said to measure ability, the span may serve as some indication of ability.[254]

In order to overcome the difficulty of the small variability of his results Galton suggested that Jacobs test 'idiots' in order to obtain a wider range.[255] Consequently Galton undertook such an investigation in two asylums, accompanied by James Sully and Alexander Bain. They found that memory span was lower in inmates of asylums than in 'normal' people.[256] Jacobs' research illustrates once more the contrast between the goals of experimental psychology in Britain and Germany at this time. Ebbinghaus was primarily interested in formulating general 'laws

of mind' rather than investigating individual differences in memory. Jacobs, on the other hand, was almost solely concerned to develop a method for this latter purpose.

Another of Galton's protegees was a schoolteacher, Sophie Bryant. Sophie Bryant taught mathematics and was later headmistress at the North London Collegiate School.[257] In 1881 she gained a first class honours degree in Mental and Moral Science and a second class in Mathematics at the University of London, before becoming the first woman to gain a D.Sc. From her youth, when she was a close friend of Bernard Shaw, she took part in many 'progressive' movements. She was extremely active in campaigning for Irish Home Rule, fought for educational reform and strongly supported Women's Suffrage, being closely involved with the National Union of Women's Suffrage Societies. With these interests she combined the writing of books and articles on education, psychology, ethics and philosophy. In 1901 she was one of the founders of the British Psychological Society.[250]

In a paper given to the Anthropological Institute in 1885 she recorded that it had been Galton who suggested to her she should devise methods of testing the mental characteristics of schoolchildren.[259] Her tests were conducted in two phases. Initially she left children alone in an unfamiliar room for ten minutes, after which they were required to write a description of what they had seen. She then inferred the ability of the children from this description and compared this estimation with that of the children's teacher, finding a 'striking agreement'. Secondly, she displayed various works of art to the children and asked them to write a description of them. She then ranked the children on the basis of the manner in which they described the picture; for example, she awarded more marks to those children who provided an explanation of what was shown in it. This type of 'comprehension' test was used in the first Binet tests and were still used in the 1916

Stanford Revision.[260] Bryant was explicit about the social value of her tests, arguing that

> I am satisfied that results obtained by such tests as those described have a genuine practical value...Their practical value depends on the use that can be made of them in the education of the person observed, or in the selection of a suitable occupation for him. If a series of observations of this kind could throw any light upon mental defects which can be remedied by education, or mental excellences which can be speedily utilized, this would be something gained.[261]

Bryant also did some research with J.M. Cattell while he was in Britain in 1886-88. This was on the subject of word association.[262] This paper reported the results made by Cattell in Leipzig and the U.S. and by both in Britain. They stressed that different people had varying association times and argued that this indicated important differences in rate of thought and stage of mental development.[263] This paper broke from Cattell's previous work in two ways. He displayed an independence from Wundt's reliance on the trained observer; secondly, his concern with the individual as opposed to the generalized human mind was now evident. This marked the beginning of a decade in which Cattell devoted himself fully to mental and physical testing, spreading the Galtonian gospel to the U.S.A.

J.M.Cattell is best known in the history of psychology for his contribution to the development of mental testing and as the author of a paper which is usually regarded as laying the foundations of the subject. This paper, "Mental Tests and Measurement". was published in Mind in 1890 after Cattell's return to the U.S.[264] Cattell began with a stirring call to arms which has been reproduced countless times in textbooks and histories of psychology:

> Psychology cannot attain the certainty and exactness of the physical sciences, unless it rests on a foundation of experiment and measurement. A step in this direction could be made by applying a series of mental tests and measurements to a large number of individuals. The results would be of considerable scientific value in discovering the constancy of mental processes, their interdependence,

> and their variation under different circumstances. Individuals, besides, would find their tests interesting, and, perhaps, useful in regard to training, mode of life or indication of disease. The scientific and practical value of such tests would be much increased should a uniform system be adopted, so that determinations made at different times and places could be compared and combined.[265]

This paragraph demonstrates the degree to which Cattell was continuing to develop the Galtonian tradition. Furthermore, Cattell had sent his paper to Galton asking for his opinion and for him to send it to Croom Robertson, editor of Mind, if it was all right.[266] The tests which Cattell detailed in his paper had been tried out at the psychological laboratory of the University of Pennsylvania where Cattell had taken up a lecturing post. He proposed two series of tests, one of ten measurements and one of fifty. These followed Galton's familiar blend of physical anthropometry and purely psychological tests, and indeed Cattell recorded his indebtedness to the work of Galton's Laboratory.[267] Of the ten tests only one was original; the others had already been used in one form or another by Galton or by one of his circle.[268] After the paper had been accepted by Mind, Cattell wrote to Galton again about it:

> If the proposed tests and methods do not meet with your approval, I hope they can be modified so as to obtain it. The tests are much the same as you have used. The pressure causing pain is, I believe, a new test, but it seems a constant of some interest...[269]

Cattell's paper and tests did no more than put in a more coherent and definite form the ideas and methods which Galton had been developing for some fifteen years. Galton appended a short note to Cattell's paper, supporting its general stance and suggesting a few amendments to the series of tests. He also wrote that

> One of the most important objects of measurement is hardly at all alluded to here, and should be emphasized. It is to obtain a general knowledge of the capacities of men by sinking shafts, as it were, at a few critical points. In order to ascertain the best points for this purpose, the sets of measures should be compared with an

> independent estimate of the men's powers. Thus we may learn which of the measures are the most instructive.[270]

Although this concern with validation was to be crucial in the development of mental testing (for example comparing test score with place in class, or with judgement of the teacher of a child's abilities) Galton did not follow it up and appears to have lost interest in mental testing in the 1890s, and it was left to others to further develop the tradition begun by him.

Anthropometric Mental Testing

After the initial burst of activity in applying Galtonian anthropometric and psychometric techniques in the late 1880s and 1890s the public visibility of this 'movement' almost vanished. Continued interest was shown in Galton's techniques by several groups: Cunningham and Haddon in Dublin; Haddon in the Torres Straits; in several educational institutions and at meetings of the B.A. (which continued to provide funds). This interest was, however, rather sporadic and no coherent movement developed which sought to systematically exploit Galton's work on an extensive and organized scale. There are several reasons for the failure of such a movement to develop. First, Galton, who had been the main proponent and patron of the research programme, became disillusioned with the usefulness of anthropometric mental testing after Venn's work at Cambridge had demonstrated that the link between physique or physical strength and ability was not a strong one. Furthermore, in the late 1880s and 1890s Galton became obsessed with fingerprints, which he hoped would provide a system for identifying criminals and others.[271] A further reason for Galton's slackening drive for the subject was his advancing years: although the decade to 1893 had been a very productive period for him, his writing declined in quantity and quality after this time.[272]

There are, however, other institutional reasons for the failure of the Galtonian tradition of testing to develop further. One important determinant lay in the lack of an academic base from which such work could be pursued and expanded via teaching. I argued earlier that the first psychological laboratories in Britain were not established until 1897, although prior to this time several attempts had been made to found one.[273] Research which had been pursued, such as that of Venn in Cambridge, was often funded by Galton himself. The lack of a university base meant that there were no facilities, no pool of ready expertise and no coherent 'research school' in existence which could pursue this research tradition. A related difficulty was the actual cost of the instruments which were individually made to order by the Cambridge Scientific Instrument Company. Such a cost would certainly have been prohibitive to many interested people.

The situation in the United States contrasted sharply with that in Britain. This was a decade of an intense and sustained pursuance of Galton's anthropometric mental testing programme.[274] One of the main people involved in this was J.M. Cattell. In 1890 he began tests on 100 students at Columbia College's School of Arts and Mines repeating them each autumn for several years on new students and re-examining them in their final year. Cattell's was perhaps the most extensive series conducted in the U.S. at this time.[275] Like Galton's work, Cattell's programme of testing was never put in a theoretical perspective and he was not even sure what his tests measured.[276] The point remains, nevertheless, that Cattell's institutional location allowed him to attract recruits and provided him with a ready audience.

By the mid 1890s virtually every psychological laboratory in the U.S. was equipped with elaborate apparatus to test the acuteness of the senses and the 'higher mental processes' such as memory and judgement.[277] The psychological literature was dominated by studies of data

from anthropometric mental tests and discussions of the merit and role of such tests in relation to experimental psychology.[278] Apart from Cattell's, the main testing programme in the United States was that organized by Joseph Jastrow. In addition to gathering large amounts of data in schools and colleges he was also responsible for a special exhibit at the World's Columbian Exposition in 1893 where visitors were invited to have themselves measured. It was almost as if Galton's 1884 laboratory had been transferred to Chicago.[279]

Although the flood of papers inspired by Galton and Cattell continued until the end of the decade these were not published without drawing criticism. One forceful opponent of the tradition was the English immigrant who had studied with Wundt, E. B. Titchener. In 1893 he published an article critical of the tests to be followed at the Chicago World's Fair. He wrote that

> If the end of the psychological experiment be psychology, then assuredly such a laboratory....is not psychological; for its chief aim is not knowledge of mental processes, but statistics related to "human faculty".[280]

At the same time,Titchener wrote to Galton enclosing a copy of his paper, asking him to contribute a note on the subject to a journal in order to support him:

> I think...you will be in agreement with its spirit. The confusion is doing great harm here — harm to both sciences...the American laboratories will all run over into anthropometrical statistics which are of course valuable — but not psychology.[281]

In his criticism Titchener betrayed his allegiance to the Wundtian approach with its emphasis on controlled experiments using trained observers for the purpose of defining elementary processes.[282] This again serves to underline the different goals of research in Germany as opposed to Britain and the U.S.

Another attack came from a student of Titchener's at Cornell University, Stella Sharp. In 1898 she published her doctoral dissertation

which compared Cattell's tests with those being developed in France by Binet. She presented a thorough critique of the work of Cattell, Jastrow, Gilbert and others, arguing that their tests were not useful in the study of any mental or physical trait beyond the narrowly defined sensory or motor capacity being measured. Anthropometric tests could not tell anything of the psychology of the people being tested either individually or as a group.[283] In 1901 a final blow was dealt to the Cattell-Galton tests by a student of Cattell's, Clark Wissler. With the help of Franz Boas, Wissler applied Galton's correlational techniques to the results of Cattell's physical and mental tests. He found that there was almost no correlation between the results of any one set of the tests and those of any other. He also calculated the correlation between test results and academic performance, again finding no correlation.[284] The implication of Wissler's work was that Galtonian tests were invalid as indicators of mental ability and anthropometric mental testing could no longer presume to offer a solid, predictive foundation for education.

The scale of the testing programme in the U.S. serves to emphasize the reasons for the failure of a similar 'movement' to develop in Britain. The most important reason for the U.S. success was the existence of psychological laboratories in the universities. These acted as a centre where psychologists could be trained in the techniques and tradition; where instruments could be set up to perform tests; where money existed to purchase apparatus. Although concern existed in both countries that these tests could be socially useful, interest was not enough. Funding and institutional support were crucial in determining success or failure.

Although the Galtonian type of tests came under severe criticism from Sharp, Wissler and others, tests employing some of Galton's techniques were used in Britain by Charles Spearman and Cyril Burt in their first contributions to the literature on mental testing. Both used tests of

sensory ability and correlated the results with examination results and teachers' estimates of ability. Although Spearman argued that a significant correlation existed between sensory tests and subject tests, Burt found that there was only a low correlation and relied more heavily on tests of the 'higher mental processes', of the type which gained widespread acceptance after the publication of Binet's work.[285] Before the first World War developments in testing in Britain were few and far between. Burt's appointment to the London County Council in 1913 signalled a new, if low key, trend in testing since it marked the beginning of official interest by education authorities. Sensory tests of the Galtonian type were put to one side and replaced by tests of the 'higher mental processes' along the lines of Binet's 1905 scale (in the form of Terman's 1916 Stanford Revision) and later Burt's 1921 version.[286]

Although Galton employed a type of mental test which lost favour this should not be taken to imply that he left no legacy in testing. Galton's legacy lay not only in his status as the most important contributor to early mental tests, but more fundamentally in his contribution to the construction of a particular approach to viewing human nature. The view which assumes that human beings possess more or less of a 'thing' called 'intelligence' or 'mental ability' did not appear overnight with Binet's scale of 1905. Nor was it a 'natural' belief since it failed to develop in Germany despite broad institutional support for psychology. It was the product of a particular tradition of framing human nature which had been pursued in a particular social and economic context. When Galton began investigating heredity the view that individuals could be categorized according to their mental attributes had already been proposed. As I argued in Chapter 3 such an approach was implicit in much of the phrenological literature. It was further elaborated and pushed in a particular direction by Alexander Bain. When Galton came to

investigate heredity as part of his eugenic 'religion' he drew upon these existing traditions. This knowledge and the techniques it embraced were themselves a product of specific social and material circumstances and were taken up, interpreted and utilized in a particular way for specific purposes by Galton. His need for a means of identifying those fit to breed in his eugenic utopia was one factor leading him to develop mental and physical tests. These tests also, however, reflected the particular material state of British society at this time as well as the perceptions of middle class social commentators concerned about the physical, mental and moral state of the Nation. In constructing his methods of investigating mental ability Galton drew heavily on German experimental psychology. His use of techniques of measuring reaction time and sensory discrimination was, however, peculiar to him and those who came under his 'influence'. The emphasis upon quantification and statistical validation, the apparent preoccupation with the methods of the new psychology, should not distract us from the fact that the Galtonian tradition was built upon a very definite conception of both mental ability and its social significance.

Chapter Four

Notes

1. (Cowan: 1977), (Mackenzie: 1981a),(Norton: 1978a). One study which does focus on Galton's psychological work is (Buss: 1976). Buss tries to argue that "democratic, liberal, capitalistic individualism" conditioned the birth of differential psychology. His analysis, however, lacks evidence for his assertion and is at a basic level idealist. This latter point is exhibited in his claim that Galton's hereditarianism was demanded by the prevailing ideology of bourgeois, liberal, democratic individualism.

2. (Terman: 1917).

3. Main biographical sources are (Forrest: 1974), (Pearson: 1914-30), (Blacker: 1952). On Galton and psychology see (Burt: 1962), although this scarcely adds much to Pearson's biography and is best viewed as a eulogy by Burt to a distant mentor.

4. (Annan: 1955).

5. It is difficult to say exactly why Galton's interests changed in the early 1860s. Certainly the publication of his cousin's The Origin of Species in 1859 had a profound impact on him. He later recalled that

> "The publication in 1859 of the Origin of Species by Charles Darwin made a marked epoch in my own mental development." (Galton: 1909, 287).

In 1869 after receiving an enthusiastic letter from Darwin, Galton replied:

> "I always think of you in the same way as converts from barbarism think of the teacher who first relieved them from the intolerable burden of their superstition. I used to be wretched under the weight of the old fashioned arguments from design...Consequently the appearance of your 'Origin of Species' formed a real crisis in my life; your book drove away the constraint of my old superstition as if it had been a nightmare and was the first to give me freedom of thought."

Galton to Darwin 24.12.1869, Pearson Collection No. 589, repr. (Pearson: 1914).

6. (Galton: 1865, 157).

7. (Cowan: 1972; 1977), (Mackenzie: 1981), (Norton: 1978a).

8. (Cowan: 1977, 133).

9. Ibid, 134.

10. (Galton: 1865, 165).

11. (Mackenzie: 1981a,51-56).

12. (Galton: 1869, 392),

13. (Mackenzie: 1981a,Chap.2).

14. See (Turner: 1974a, b; 1978), (Jacyna: 1981), (Durant: 1977, Chap.1).

15. (Turner: 1974b; 1978). This will be discussed more fully in Chapter 6.

16. (Galton: 1874a, 260).

17. See the excellent discussion of this theme (Durant: 1977, Chap.5).

18. (Galton: 1865, 157).

19. As Ruth Cowan has argued, Galton's case was not supported by very much in the way of evidence (Cowan: 1977, 135).

20. (Galton: 1865, 158).

21. ditto.

22. (Cowan: 1977, 135-36).

23. (Galton: 1869, 1).

24. ditto.

25. Ibid, 51-53.

26. Ibid, 58.

27. The fruits of his long and rambling discussion of this topic were, he said "dry and of little general interest". (Galton: 1869, 58).

28. Ibid, 66.

29. For a comparison of the statistical writings of Galton and Quetelet see (Hilts: 1973). The particular work of Quetelet's referred to by Galton was his Letters on Probability (trans. 1849).

30. (Galton: 1869, 72).

31. Ibid, 76.

32. Ibid, 7.

33. Ibid, 87.

34. (Cowan: 1977, 136).

35. The evidence put forward by Ruth Cowan on this point is, to say the least, cursory.

36. See Chapter 3. One example of this wider hereditarianism can be found in the writings of William Farr who was for forty years responsible for compiling the Annual Reports of the Registrar General. He also supported a policy of 'negative eugenics'. On Farr see (Hilts: 1970), (Eyler: 1979).

37. This has also been asserted by Ruth Cowan, see (Cowan: 1977, 137). Somewhat strangely she characterizes the writings of Gall and Spurzheim as expressing a 'moderate environmentalist' outlook. It is only by a redefinition of 'hereditarian' that one can arrive at this view. For recent work displaying the hereditarian theme of much phrenological literature see for example (Hilts: 1982). One should, however, recall that phrenology had a much more environmentalist thrust in the United States as compared to Europe. (Rosenberg: 1972, 301).

38. For an excellent discussion see (Lorimer: 1978, Chap.7); see also (Bolt: 1971), (Biddis: 1979).

39. See (Penniman: 1935), (Biddis: 1979, 15).

40. (Hoyme: 1953), (Haller: 1971, Chap.1).

41. At the same time as anthropologists constructed a scheme of race differences they also built into their conceptual framework a particular view of women. Women, children and 'savages' were all closely identified and numerous assertions were made that women lay at a point lower in the hierarchy than men. For an excellent discussion see (Fee: 1979).

42. Farrar was later to aid Galton in collecting anthropometric data.

43. (Farrar: 1867).

44. Ibid, 120.

45. (Croom Napier: 1867, CLXV). It should be noted that even at this time phrenology was considered by some observers to have important things to say about racial differences. For example, J. W. Jackson argued in 1867 that phrenology was of great value in grading races, and in defining 'rank and quality' of different races (Jackson: 1867). Phrenology was of course thoroughly discredited in the eyes of many commentators and Jackson's approach was subjected to violent criticism by the President of the Anthropological Society of London, James Hunt (Hunt: 1867).

46. (Galton: 1869, 23).

47. (Forrest: 1974, 38-54). His visit was arranged by his cousin Captain Douglas Galton who was a Fellow of the Society; Ibid, 38. Galton's book gained him entry to the scientific establishment and the Royal Geographical Society presented him with a Gold Medal and elected him to the Council.

48. (Fancher: 1983b).

49. qu. Ibid, 71.

50. Membership list in Journal of the Ethnological Society, Vol.II (n.s), XX.

51. For an excellent account of the Society see (Stocking: 1970); see also (Rainger: 1978).

52. (Stocking: 1971, 380), (Biddis: 1979, 14).

53. (Stocking: 1971, 381).

54. (Galton: 1865, 320).

55. (Semmel: 1960). Semmel was, however, addressing himself to the period at the turn of the century. On Social Darwinism in general in Britain see (Jones: 1980).

56. (Galton: 1869, 392).

57. Ibid 394-95.

58. (Stocking, 1971), see also J.E.S.L.

59. I would argue that Ruth Cowan is quite wrong in claiming that "For almost a century students of ethnology had believed that racial temperaments were determined by environment". (Cowan: 1977, 140).

60. (Galton: 1869, 77).

61. (Bain: 1861, 192).

62. Ibid, 198.

63. (Galton: 1883b, 25).

64. (Briggs: 1959b,7).

65. Ibid, 9.

66. (Smiles: 1859, 57).

67. Ibid, 146.

68. Ibid, 1.

69. Ibid, 228-29.

70. (Briggs: 1959b,25-26).

71. (Bain: 1861, 199).

72. Ibid, 191.

73. (Galton: 1865, 164), Cf. Bain:

> "There may be exceptional individuals whose total of power is a very large figure, who can bear more work, endure more privitation, and yet display more buoyancy, without shortened life, than the average human being. Hardly any men can attain commanding greatness without being constituted larger than his fellows in the sum of human vitality." (Bain (1868), 1884, 9).

74. In Galton Collection No. 120/1.

75. Ibid, notebook p.18-19.

76. Ibid, 19.

77. Ibid, 30.

78. Ibid, 32-33 (emphasis in original).

79. (Galton: 1874a, 75).

80. (Galton: 1883b, 25).

81. Ibid, 27.

82. See (Cowan: 1972).

83. (Galton: 1877). In the Galton Collection there is a bundle of papers marked "Psychometric Inquiries 1876", No.151.

84. (Sully: 1876).

85. (Galton: 1877, 100).

86. Ibid, 95.

87. ditto.

88. See for example (Boring: 1950), (Murphy: 1949),(Fechner: (1860), trans. 1966).

89. He gained this knowledge from an article in Mind the previous year by James Ward. In this article Ward discussed at great length the work of Fechner and referred to research on weight judgement, reaction time and judgements of length of line. (Ward: 1876).

90. (Galton: 1877, 95).

91. (Boring: 1950, 34-53).

92. Donders' most important paper was entitled "On the Speed of Mental Processes" (1868); on his life and work see (Bowman: 1969). The techniques were expanded and modified in successive editions of Wundt's Grundzüge der Physiologischen Psychologie.

93. On Wundt see (Blumenthal: 1975), (Bringmann et al.: 1975), (Sokal: 1980, 8-11, 96-98). See (Hearnshaw: 1979a) on Wundt's 'influence' on British psychology.

94. (Galton: 1877, 96).

95. This was the first experimental investigation of association (Warren: 1921, 215). For a discussion see (Forrest: 1977).

96. (Galton: 1879b, 150). This paper was published in two versions: a 'popular' one in Nineteenth Century and a more academic one in the neurological journal Brain. It is the latter version referred to here.

97. Galton's paper suggests that the version of association he had in mind was that of Herbert Spencer, see (Croom Robertson: 1886, 733).

98. (Galton: 1879b, 149).

99. ditto.

100. (Galton: 1880, 301).

101. (Forrest: 1974, 149).

102. Galton published a paper detailing this method five years earlier, see (Galton: 1875). The method involved assuming that out of one hundred people seven could represent the characteristics of the entire group.

103. (Galton: 1880, 318).

104. Note in Galton Collection, 20/9/1880. (No.152/1).

105. Galton took notes from this work, Galton Collection Nos. 152/4, 186.

106. Galton Collection No. 186.

107. ditto.

108. Letter from Kegan Paul to Galton, Pearson Collection No.589.

109. "The state of the case is that I am now engaged in investigation into psychometry, with the view of future publication, but that although I am already in possession of much scattered information and have many general ideas on the subject I am very far from being ready to begin on the book. I have many experiments to make and much to contrive, and to think out. Still I may say I hope and expect to have the MS ready in a year from now." Letter from Galton to C.Kegan Paul (undated), Pearson Collection, No.589.

110. Note written by Galton 23/10/1879, Pearson Collection No. 589.

111. What follows is from a notebook in the Galton Collection entitled "Psychometry, Exner, Donders, Hirsch", No.186. His notes from Exner were very extensive, running to thirteen pages.

112. The article by Donders was "Deux Instruments pour la Metture du Temps Necefaire pour les Acts Psychiques" ('Two Instruments for Measuring the Time Necessary for Psychical Acts"), published in Halem Archives Nieslaudaires Vol.II (1867) and another in Vol.III of the same journal.

113. The Hipp Chronoscope was a device widely used for measuring reaction time, see (Sokal et al.:1976), (Edgell, Symes: 1906). The articles by Hirsch were published in Bulletin de la Société de Sciences Naturalles Vol.VI (1861), Vol.X (1873).

114. Galton probably gained the names of some of these authors from Sully's review of experimental psychology in Germany, where Fechner, Exner, Donders and Wundt are discussed in detail, see (Sully: 1876).

115. Croom Robertson to Galton 29/1/1876, Galton Collection No.190. Galton later recalled that Robertson had been "a thorough friend, whose death left a void in my own life that has never been wholly filled." (Galton: 1908, 267).

116. (Croom Robertson: 1879, 551, 557).

117. Ward to Galton 24/11/1879, Galton Collection No. 152/4.

118. (Bain: 1880b). Bain was discussing (Galton:1880).

119. (Bain: 1880b,565).

120. Ibid, 568.

121. (Galton 1883b, 27), see also (Galton: 1883a).

122. (Galton 1883b, 28).

123. In a lecture to the Royal Institution a decade later, Galton repeated his views:

> "The least perceptible difference varies considerably in different persons, delicacy of perception being a usual criterion of superiority of nature. The sense of pain is curiously blunted in idiots." (Galton:1893, 15).

Galton's view that women were intellectually inferior to men was quite unexceptional, for a useful discussion see (Burstyn: 1980, 70-83).

124. (Bain: (1877) 1879, 15-16).

125. See Galton Collection No. 152/4, 186. His notes from On the Study of Character are particularly extensive.

126. Galton Collection No. 137/4, notes and calculations on reaction time and a drawing for an instrument, dated Jan. 30 1878 and Feb. 1878. Galton had already devised an instrument for measuring the limits of audible sound in different people. It is not clear whether this was conceived as part of his psychometric inquiries, see (Galton: 1876).

127. (Galton: 1883a). His apparatus consisted of a series of weights, the value of which was calculated according to Weber's law, i.e. they increased in a geometric series. The test consisted of placing the weights in the correct order of magnitude. The grade beyond which the order was not correctly given gave a measure of the muscular sensitivity of the individual.

128. Ibid, 474.

129. Sully to Galton. 2/2/1883, Galton Collection No. 152/8.

130. qu. (Pearson: Vol.II, 212). The pamphlet was entitled Outfit for an Anthropometric Laboratory.

131. "(Frank) worked at means of measuring the sensations helped by Croom Robertson," Louisa Galton's "Record" (1883), qu. (Forrest: 1974, 178); see also (Galton: 1908, 266-67).

132. Pearson Collection No. 589, (dated 28/1/1884), repr. (Pearson: Vol.II, 213) without Ward's name (emphasis added). In his biography Pearson claims that this was a letter circulated to several psychologists, but I can find no evidence that this was so - certainly the original is in Galton's handwriting rather than being a copy.

133. Ward to Galton 30/1/1884, Galton Collection No. 152/4; part repr. (Pearson: Vol.II, 213).

134. (Anon.: 1883, 20).

135. (Houghton: 1957, Chap.3).

136. See (Williams: 1973) for a useful and suggestive exploration of this theme. See also (Houghton: 1957, 77-89).

137. For a good recent summary see (Tanner: 1981; Chap.7).

138. Ibid, 142-46.

139. Ibid, 147-56.

140. Parliamentary Papers (1873), qu. (Tanner: 1981, 170).

141. Ibid, 169-72.

142. Jones: 1971, 128-33, 281-314).

143. qu. Ibid, 128. Marshall was writing in 1884.

144. (Galton: (1873a).

145. Ibid, 308.

146. (Galton, 1869, 396).

147. (Galton: 1873b).

148. Ibid, repr. (Galton: 1883b, 363-70).

149. See for example (Farrar: 1867) for his anthropological interests. Farrar later became Dean of Canterbury. Galton had been in touch with Farrar five years previously on the subject of geographical education (Forrest: 1974, 87).

150. (Fergus, Rodwell: 1874), (Galton: 1874b).

151. (Fergus, Rodwell: 1874, 129).

152. (Galton: 1874b, 130).

153. Ibid, 135.

154. (Galton: 1876).

155. Ibid, 181.

156. qu. (Jones: 1971, 129).

157. Ibid, 282-83, 286-87.

158. For details of Beddoe's life and work see the introduction by D.E. Allen to (Beddoe: (1885) 1971).

159. (Beddoe: 1869). This work was originally conceived as part of the research which J.B. Davis and J.C. Thurnham had pursued for their massive Crania Brittanica (1854), Ibid, 384.

160. Ibid, 390.

161. ditto.

162. Ibid, 561-62.

163. Ibid, 566-67. Beddoe's continued this work in The Races of Britain (1885).

164. (Jones: 1980, 140-41), (Lorimer: 1978), (Weber: 1974, 276-77).

165. (Keating: 1976, 13-14), (Weber:1974, 277). This line of thought was continued by the social commentator Arnold White who wrote an article entitled "The Nomad Poor of London" (White: 1885).

166. (Keating: 1976, 18-20).

167. (Sims: 1883), repr. (Keating: 1976, 64-65).

168. Ibid, 77-78, 81. Perhaps the most famous work in this genre was William Booth's In Darkest England which is constructed around an analogy with 'Darkest Africa'. Booth began:

> But while brooding over the awful presentation of life as it exists in the vast African forest, it seemed to me only too vivid a picture of many parts of our own land. As there is a darkest Africa is there not also a darkest England? Civilization, which can breed its

168. (cont.)

> own barbarians, does it not also breed its own pygmies? May we not find a parallel at our own doors, and discover within a stone's throw of our cathedrals and palaces similar horrors to those which Stanley has found existing in the great Equatorial forest? (Booth: 1890, repr. Keating: 1976, 145).

169. (B.A.A.S. Anthropometric Committee: 1875, liv-lv).

170. These included General Pitt-Rivers and Professor Flowers (Keith:1917). The idea for the committee appears to have originated in suggestions made by Beddoe in a paper read to the anthropology section of the B.A. (Rudler: 1875-76, 350).

171. (Howarth: 1922, 200-01), (Brock: 1981, 103,105), (BAAS Anthropometric Committee: 1875, liv), (B.A. Report: 1877, lvii; 1878, lxv; 1879, lxxii; 1880, lxii; 1881, lxvi). In the period 1875-81 £243.15s. was spent by the committee (B.A. Report: 1881, 231); by 1883 the expenditure was £280. (B.A. Report: 1883, 253).

172. (B.A. Report: 1876, 266).

173. (B.A. Report: 1878, 153; 1880, 158).

174. Henry Bowditch (1840-1911) was responsible for carrying out detailed studies of human growth and physique in Boston, publishing his work in the Annual Report of the Board of Health of the State of Massachusetts. (Tanner: 1981, 185-96).

175. He had been one of the doctors employed by the 1872 Parliamentary Commission to investigate the employment of women and children in textile factories and for the next ten years carried out extensive investigations into the physique of children. Roberts had specific aims in this work in that he was concerned with the wellbeing of children in factories. He used his measurements to suggest that children should be of a particular height before being employed. (Tanner: 1981, 172-80).

176. (B.A. Report: 1883, 298).

177. (Galton: 1883b, 20).

178. The interest of anthropologists resulted in the formation of another committee consisting of some members of the anthropometric committee (including Galton, Beddoe and Pitt-Rivers) entitled "Committee to Obtain Photographs of Typical Races of the British Empire". See (B.A. Report: 1881, lxii; 1882, 270-76; 1883, 306-08). It was funded by the B.A.

179. For example, Pitt-Rivers measured the 2nd Royal Surrey Militia (B.A. Report: 1877).

180. For details of the laboratory see (Galton: 1884 a,b; 1891), (Forrest: 1974, 180-86), (Pearson: Vol.II, 357-86).

181. (Cowan: 1972, 1977).

182. (Galton: 1882a).

183. (Galton: 1883c).

184. (Galton: 1883b, 40-41).

185. Ibid, 44.

186. (Cowan: 1972, 521). In 1906 he renewed his appeal for proper centres to be set up to keep records of anthropometric data,

186 (cont.)
suggesting that schools would be ideal places (Galton: 1906).

187. (Galton: 1884a, 206).

188. The apparatus and methods of use are described in (Galton: 1884a, 213-19). Galton's instruments were made by the Cambridge Scientific Instrument Company, of which Horace Darwin was one of the Directors, see (Galton: 1886, 3).

189. (Galton: 1886, 3).

190. (Galton: 1891).

191. Galton to Abel, 8/2/1891, Galton Collection No. 263/2. Abel replied stating that it was not the Institute's fault, laying the blame on the Commissioners of the Science Museum who had altered their arrangements with the Institute; Abel to Galton 20/2/1891.

192. Galton to Dr. Garson 1/9/1880, Galton Collection No. 192 (letter stating that B.A. was willing to pay for the laboratory and the expense of an attendant); Lloyd Tanner to Galton 10/7/1891, Galton Collection No. 214/4. In 1891, for example, 135 people were measured at the annual meeting, see (B.A. Report: 1891).

193. (Galton: 1884a; 1886).

194. Galton Collection No. 137/14.

195. MS of Rede Lecture, Galton Collection No. 137/5, 44-45.

196. (Venn: 1888, 141).

197. Venn to Galton 6/2/1888, 15/10/1889, 18/11/1889, Galton Collection No. 334.

198. Ibid, 23/9/1887.

199. Ibid, 7/11/1887.

200. (Venn: 1888, 145-47).

201. (Venn: 1890, 451).

202. Venn wrote to Galton after the latter had inserted a note of their work in Nature:

> "My only complaint of your notice in Nature is that you should have given our readers the impression that the investigation was mine, instead of my merely working closely on your suggestions."

Venn to Galton 8/5/1888, Galton Collection No. 334. The correspondence between Venn and Galton demonstrates that throughout the period in which Venn was laboriously tabulating the results he continually sought Galton's aid and guidance, and that Galton visited the laboratory on several occasions to sort out problems.

203. (Venn: 1890, 451).

204. (Galton: 1889c, d), (Somerville: 1889).

205. (Pearson: Vol.II, 386-96).

206. (Galton: 1874a, 97-98).

207. Notes in Galton Collection No. 157/7. Galton's interest in phrenology may have dated from 1849 when he had his head read by Mr. C. Donovan, whose report is preserved, Galton Collection No. 49.

208. (Galton: 1884a, 210).

209. (Galton: 1886, 4).

210. Beevor to Galton, 16/12/1888, Galton Collection No. 200/1.

211. (Venn: 1888, 147).

212. (Venn: 1890, 451).

213. (Galton: 1886, 155-56).

214. (Galton: 1889a, b).

215. (Galton: 1890a).

216. See (Love: 1979, 149-52) for a discussion of Alice Lee.

217. Galton to Pearson 13/11/1900, Galton Collection No. 245/180.

218. qu. (Love: 1979, 151).

219. Pearson to Galton 25/10/1901, No. 293E.

220. Ibid, 20/12/1901, No. 293E.

221. Galton to Pearson 23/12/1901, No. 245/18E.

222. (Pearson: 1902, 1906). At this time Binet also investigated the question and also rejected the connection (Binet: 1898; 1900).

223. For Eton see (Pearson: Vol.II, 379); Birmingham, Letters from Sir Bertram Windle of King Edwards Schools to Galton (1891-93), Galton Collection 343/4; Aberdeen, letters from Prof. R.W.Reid to Galton (1892), No. 303/5; Oxford, letter from Galton to Sir John Burden Sanderson (1886), No. 245/4, also (Forrest: 1974, 182).

224. Cunningham to Galton 13/6/1890, Galton Collection No. 227/4.

225. Cunningham to Galton 16/7/1890, No. 192; 6/7/1890, No.227/4.

226. Cunningham to Galton 9/2/1891, No. 223/4.

227. (Haddon, Cunningham: 1891, 35); see The Freeman's Journal 20/6/1891 for a report.

228. (Haddon: 1893; 1896; 1898), (Haddon, Browne: 1892); (Browne: 1893; 1894; 1896).

229. See (Haddon (ed): 1901-35), (Myers: 1902), (Quiggin: 1942; 1968), (Langham: 1981, 67-73), (Slobodin: 1978), (Rintoul: 1978, 30-36).

230. Haddon to Galton 29/6/1896, Galton Collection No. 249.

231. One member of the expedition, C.S.Myers, went on another expedition this time to Egypt where he collected a large amount of anthropometric data (Myers: 1903-1908).

232. (Searle: 1971).

233. (Cunningham et al.:1905), (B.A. Report: 1904, 330-37), (Gilbert: 1965).

234. The interest generated by Galton's work is clearly shown in an address given by Alexander Bain to the British Association in Aberdeen in the year following the opening of the South Kensington Laboratory. Bain pointed to the work of the B.A. anthropometric committee and argued it was important to note that mental as well as physical equalities could be measured. He then proceeded to list the various means which could be used (Bain: 1886).

235. See (Sokal: 1972; 1980).

236. (Sokal: 1972, Chap. 1-2).

237. Ibid, 217-19.

238. (Cattell: 1886a, b; 1887; 1888).

239. (Sokal: 1972, 178-79).

240. Ibid, 214-17.

241. Ibid, 219-23.

242. Cattell later wrote that Galton was "the greatest man whom I have ever known". (Cattell: 1929, 338).

243. (Galton: 1886, 7).

244. Cattell wanted Galton to collaborate on writing a book with him, see Cattell to Galton 24/5/1888, Galton Collection No.220.

245. (Sokal: 1980, 222-23; 1972, 306-11, 123-24).

246. I discuss Jacobs and his work on Jews in Chapter 5.

247. (Jacobs: 1886, 52, 54).

248. (Jacobs: 1885e, 454).

249. Ibid, 459.

250. (Jacobs: 1887, 75, 78).

251. Ibid, 76.

252. Ibid, 77.

253. (Dubois: 1970). It is interesting to note the similarities between Jacobs' work and the concept of 'mental age'.

254. (Jacobs: 1887, 78).

255. ditto.

256. (Galton: 1887).

257. See (Doorly: 1950).

258. (Kenna: 1961).

259. (Bryant: 1885, 338). Galton and Bryant had already met at meetings of the Society for the Development of a Science of Education. Galton wrote a short paper for the Society in 1878 in which he urged that

> It cannot be too strongly enforced upon masters, that unequalled opportunities for psychological and many other kinds of statistical enquiry exist in their schools...Under no other conditions are human beings so carefully classed, brought together in so compact a mass, or so continually under close inspection, as they are in schools.

From a printed note, Galton Collection No. 271/2.

260. (Dubois: 1970).

261. (Bryant: 1885, 343).

262. (Cattell, Bryant: 1889).

263. Ibid, 233.

264. (Cattell: 1890).

265. Ibid, 373.

266. Cattell to Galton 22/10/1889, Galton Collection No. 220.

267. (Cattell: 1890, 373). Cattell justified his inclusion of physical tests by stating that

> "the greatest possible squeeze may be thought by many to be a purely physiological quantity. It is, however, impossible to separate bodily from mental energy."

267. (cont.)
Ibid, 374. This once more underlines Cattell's debt to Galton.

268. The tests were: strength of hand, reaction time, bisection of a line, memory, judgement of a time interval, time taken to name colours; judgement of weight difference, smallest pressure causing pain, rate of movement, skin sensation.

269. Cattell to Galton 29/1/1890, Galton Collection No. 220. Michael Sokal has written that three of Cattell's tests were original - rate of movement, pressure causing pain and memory (Sokal: 1972, 316). In fact only the second is original; the memory test had already been used by Jacobs and Galton had already employed rate of movement. See (Galton: 1890b, 380).

270. (Galton: 1890b,380).

271. (Forrest: 1974, Chap.15). It is unclear precisely why Galton's interest shifted to fingerprints at this time.

272. Ibid, 224.

273. See Chapter 2.

274. See (Weinland: 1970, Chap.2), (Young: 1974). On the 'influence' of Galton on American psychology see (Diamond: 1976).

275. See (Cattell, Farrand: 1896), (Sokal: 1981, 336-37).

276. (Sokal: 1981, 337).

277. By the mid 1890s there were over eighteen such psychological laboratories in academic institutions in the United States (Camfield: 1973, 67).

278. (Young: 1974, 35). Cattell's lead was followed by many other American psychologists. William Porter compared physical and sensory tests of over 35,000 children with their progress in school. He concluded that brighter children (as measured by their school performance) were taller and heavier and asserted that this established a physical basis for precocity and dullness (Porter: 1893). Another important study was that of J.A. Gilbert at Yale (Gilbert: 1894, 1897).

279. (Jastrow: 1892). On the World's Fair see (Baldwin: 1894), (Philippe: 1894), (Jastrow: 1894). Jastrow had actually tried to enlist Galton's help; Jastrow to Galton 17/7/1892, Galton Collection No. 267/2.

280. (Titchener: 1893).

281. Titchener to Galton, 13/4/1893, Galton Collection No. 328.

282. (Young: 1974,37).

283. (Sharp: 1898).

284. (Wissler: 1901).

285. (Spearman: 1904b), (Burt: 1909).

286. The post 1900 history of testing in Britain has begun to receive some belated interest from historians, see (Sutherland, Sharp: 1980), (Sutherland: 1977; 1980), (Norton: 1976a; 1979), (Hearnshaw: 1979b),(Evans, Waites: 1981).

CHAPTER 5

INVESTIGATING THE ALIEN : ANTHROPOLOGY, PSYCHOLOGY AND JEWISH IMMIGRATION IN BRITAIN 1880-1900

"In relation to society numbers are qualities"

George Elliot Daniel Deronda (1876)
quoted on title page, Joseph Jacobs
Studies in Jewish Statistics (1891)

"It is practically impossible to imagine that our ideas of objectivity and factual accuracy, and the basic place of numbering or quantification in our world view, are historical products rather than eternal principles of analysis."

R. M. Young "Why are Figures so Significant?" in Demystifying Social Statistics (1979), 63.

Although Francis Galton was very active during the 1880s and 1890s in attempting to disseminate his ideas about physical and mental 'worth', historians have generally concluded that this activity was without direct practical issue at this time. In what follows I will discuss a case in which Galton's theories and methods were utilized for a practical purpose during this period. This case study serves to emphasize that in general any body of knowledge, although constructed by individuals or groups for particular purposes, will only achieve widespread utilization if there exists a social and political setting in which it 'meshes' with the ideas, aspirations and aims of some group of people with some degree of power. Such, I suggest, was the situation with Galton's anthropological and psychological ideas and some members of the Jewish community in Britain.

The work which I consider below was undertaken by Joseph Jacobs. Jacobs was one of a small band of researchers who drew inspiration and patronage from Francis Galton. During the 1880s Jacobs read several papers before the Anthropological Institute and published others in serial form in the Jewish Chronicle. These papers dealt in detail with the social, physical and psychological characteristics of Jews. I shall argue that both Jacobs' concern specifically with Jews, and the particular content of his papers, must be understood in the context of the anti-Semitic thought which was widespread in Europe in the 1880s, the large number of Jewish immigrants who arrived in Britain at this time and Jacobs' place in the already established Jewish community.

Jacobs was one of that large band of Victorian intellectuals whose interests encompassed a bewildering constellation of subjects.[1] He was born in Australia in 1854 and educated at Sydney University before emigrating to Britain. After arriving in this country he attended first London, then Cambridge University (St. John's College), graduating from Cambridge with a B.A. in 1876 and coming first in the Moral Sciences

Tripos. He then set off to study in Germany with the philosopher and psychologist Lazarus. On his return from Germany he supported himself by writing and reviewing. Jacobs remained in Britain until 1900 when he emigrated to the United States to become one of the editors of The Jewish Encyclopaedia. Subsequently he became editor of The American Hebrew, the most prestigious Jewish paper in the U.S. At the time of his death in 1916 he held a post at the Jewish Theological Seminary in New York.

Jacobs' range of interests was immense and his publication list extensive. Among his many guises were that of historian, statistician, anthropologist and the main literary critic of one of the most prestigious London weeklies, The Athenaeum. From the late 1870s he was heavily involved in the affairs of the Jewish community in Britain. He was for a time also one of the leading authorities on folk-lore, being editor of the journal Folklore and secretary of the International Folk Lore Council.[2] He also edited numerous editions of English literary classics such as Jane Austen's Emma and works by Thackray. In addition he founded The Jewish Historical Society of England, The Jewish Yearbook and The Literary Yearbook. The above does not constitute a full list of Jacobs' activities, he was a Victorian polymath of enormous energy.[3]

What is Jacobs' stature as a historical figure? It could not be claimed, and I certainly do not do so, that he was a major figure in British history. What it is important to recognize is that he was an important figure within the Jewish community in London in the late nineteenth century. Jacobs was one of a group of Jewish intellectuals who termed themselves 'The Wandering Jews' and who met regularly for discussion in each other's homes.[4] This group was centred around Asher I. Myers, editor and joint owner of The Jewish Chronicle, then as now the main organ of middle class Jewry in Britain. Jacobs contributed numerous articles and editorials to Myers' paper.[5] He was

thus a figure in a position of some influence within the Jewish community.[6]

Between 1882 and 1890 Jacobs published a series of investigations which dealt with the social, physical and intellectual characteristics of Jews. These were published in several volumes of the Journal of the Anthropological Institute, in serial form (in thirteen weekly parts!) in The Jewish Chronicle and later republished in book form.

The Racial Characteristics of Jews

In the papers which he read before the Anthropological Institute Joseph Jacobs sought to present evidence relating to two main themes. First, he investigated whether the concept of a distinct Jewish race was an empirically justifiable and valid one. Secondly, he explored the question of whether Jews were inferior mentally, morally, or socially to other races.

At the outset of the first paper which he presented to the Anthropological Institute, Jacobs told his audience that he had

> endeavoured to bring together all the data, scientific or historical, which bear upon the purity of the Jewish race.

In doing so he had

> found it necessary for this purpose to scrutinise somewhat closely many Jewish qualities and habits that have hitherto been regarded as peculiarly results of race.[7]

Jacobs' concern with the racial purity of Jews was by no means a new departure within anthropological thought. It had long been held that Jews afforded an interesting anthropological case study by virtue of their 'separateness' from others. Indeed, Jacobs' paper was read at a meeting of the Anthropological Institute devoted entirely to the question of the 'Jewish Race'. This concern with Jews as a 'race' formed part of the wider interest shown by eighteenth and nineteenth century anthropologists in the 'varieties' of human beings.

One of the main enterprises in which nineteenth century anthropologists were engaged was the classification of humans by means of racial

typologies.[8] During the period with which we are concerned many commentators claimed to be able to distinguish races by visible features such as skin colour and head shape and size, and to be able to infer from these traits intellectual and psychological characteristics of different races. They were quite certain that they could perceive unique features of Anglo-Saxons, Celts (especially the Irish), Jews and various European groupings in addition to distinguishing between white and coloured races.[9]

In his discussion of Jews as a race Jacobs had recourse to utilize many of the conceptual tools of Victorian anthropology. He presented two types of evidence in support of his thesis that Jews formed a pure and distinct racial category. These were historical data and evidence relating to the physical characteristics of Jews.[10] When discussing the evidence based upon historical data Jacobs was concerned to reply to the arguments of anthropologists who argued, with copious reference to historical examples, that intermarriage between Jews and non-Jews had been common and that Jews therefore did not constitute a pure race. Jacobs replied to these arguments in several ways. He pointed to the existence of a group of Jews who were forbidden by the faith they embraced from marrying even converts to the Jewish religion and to the antagonism which had existed throughout history between Jew and Gentile which would hardly be conducive to many mixed marriages.[11] He also argued that even if intermarriage had been frequent the gradual 'diluting' of the Jewish race would not be a necessary conclusion of this process for, according to data which he presented, 'mixed' marriages are comparatively infertile. Arguing from the premise of Galton's 'Law of Ancestral Heredity', he claimed that this comparative infertility would reduce the influence of such marriages on the racial purity of Jews as a whole by a geometric ratio.[12] To some anthropologists of the period Jacobs' argument that mixed marriages were comparatively infertile

was perfectly sensible. According to a standard argument supported by proponents of a polygenist view of the origin of human races, first put forward by Broca in 1856, races which were physically dissimilar produced offspring which were in some degree or other infertile.[13] Jacobs further supported his case for racial purity by reference to Darwin's 'Law of Sexual Selection'.[14] He argued that it was a universal law that owing to sexual selection males of a species vary considerably more than females and that therefore when it is found that females of one group vary less than males it may be concluded that they belong to a true race (i.e. species). This was, he argued, the case with male and female Jews.[15]

The second type of evidence which Jacobs adduced in support of his thesis that Jews were a pure race was based upon their physical characteristics. In his appeal to this type of evidence Jacobs followed commonly accepted methods and procedures in mid and late nineteenth century anthropology. The classification of humans into races had been one of the fundamental activities of anthropologists for some time. In the early eighteenth century Linnaeus had developed a taxonomic system based upon skin colour; Buffon classified races by means of hair type, skin colour and stature. Much of the racial classification practised by nineteenth century anthropologists was based upon the work of Blumenbach who divided humans into five varieties of one species (the Caucasian, Mongolian, Ethiopian, American and Malay). In this he utilized hair, colour, bodily structure and, in particular, the form of the skull.[16] Generally, most early nineteenth century anthropologists such as William Lawrence, J. C. Prichard, J. Waitz, took for granted the reality of the five races.[17] In his paper Jacobs presented details of the hair type, eye colour, complexion and facial characteristics of Jews, finding that they tended to have darker hair and eyes and distinctive nose and lips than non-Jews. In compiling this data Jacobs combined results which had been obtained in extensive investigations by the eminent British

anthropologist John Beddoe and also Rudolf Virchow.[18]

Jacobs also drew upon data from the subject which lay at the heart of nineteenth century physical anthropology — anthropometry. In anthropometric investigations anthropologists sought to gain a picture of the total physical state of humans by measuring characteristics such as height, weight, arm span, chest size and size and shape of head. Anthropometric, and particularly craniometric, techniques had been of central importance in anthropological research since the late eighteenth century, especially in attempts to differentiate between races. From their foundation in the work of J. F. Blumenbach techniques of craniological investigation underwent continual elaboration and redefinition, both theoretical and practical, during the nineteenth century. Within craniometry one of the main lines of investigation centred on what was called the cephalic index.[19] The cephalic index was invented by Retzius in 1840.[20] This index was defined as the breadth of the head above the ears expressed as a percentage of its length from forehead to back; thus as the head becomes proportionately broader the cephalic index increases. Retzius called 'broad' heads brachycephalic and 'long heads' dolichocephalic. This categorization was later further refined and an intermediate category, mesocephalic, was introduced. Retzius used the index to show that each human race was heterogeneous and that dolichocephalic heads predominated in north west Europe and brachycephalic in east and central Europe. It was recognized as a useful means of comparing past and present human races, and it assumed an important role in racial ethnography. The ascription of a head to any of the three categories contained an implicit judgement regarding the 'intelligence' or degree of civilization of that person — broad heads were thought by many to be inferior and had preceded long heads in their appearance in history. The exacting calculations of the craniologists readily incorporated the ethrocentric assumptions of Victorian biological science. The European

head shape was always the standard of comparison and any deviation from this ideal revealed degeneration or inferior development.[21]

In his paper on the racial characteristics of Jews, Jacobs presented details of measurements made of Jewish heads which he had gathered from several sources. He gave the average cephalic index obtained by various investigators and the proportion of dolicho-, meso-, and brachycephalic Jews measured by them. The results appeared to demonstrate that Jews were predominantly brachycepalic and not, therefore, physically long headed. This result could be seen to imply that Jews tended to be 'superior' in their development to other races. Jacobs later attempted to set this result on a firmer footing in a paper read before the Anthropological Institute in 1889 when he presented results of measurements made by himself.

The final body of evidence to which Jacobs appealed was that relating to the physiognomy of Jews.[22] He argued that Jews possessed distinct facial characteristics which were peculiar to them as a race. Jacobs believed that there was objective, indeed <u>scientific</u>, evidence that Jews possessed a common "expression". The evidence to which he appealed resulted from what was known as composite portraiture.

Composite portraiture had been developed by Francis Galton in the late 1870s.[23] It involved the collection of photographs of a group of people, all photographed in the same way (for example, full face or in profile) in identical lighting conditions. The portraits were then photographically reduced to the same size and each exposed for the same length of time, in sequence, on one photographic plate in a camera.[24] Galton first publicly suggested the technique in his "Address to the Department of Anthropology" at the British Association in Plymouth in 1877.

As outlined in the last chapter, Galton suggested several ways in this Address in which people could be differentiated according to

their mental abilities. He also considered the question of how, having found a group of the same ability, one could determine the physical characteristics most commonly associated with the mental ones.[25] It was for this purpose that Galton developed his methods of composite portraiture. His problem was that having obtained photographs of a group of people, could he obtain the characteristics typical of the group as a whole? One method used by anthropologists at this time was simply to compare photographs side by side, but Galton considered this to be untrustworthy and sought a more objective method:[26]

> As a means of getting over the difficulty of procuring really representative faces, I continued the method of composite portraiture.[27]

The effect of Galton's procedure was, he stated,

> to bring into evidence all the traits in which there is agreement and to leave but a ghost of a trace of individual peculiarities.[28]

He regarded composite portraiture as constituting 'real generalizations' and that it was in effect a process of obtaining 'pictorial statistics'.[29]

These procedures of Galton's must be interpreted within the wider concerns of middle class Victorian society. This was the age of the social survey, of the philanthropist, of concern with the threat of alcoholism and disease (especially tuberculosis) from the working class. One of the recurring images in the literature of the social commentators in the late 1870s and 1880s was that of the existence of a 'residuum' in the 'great cities' which consisted of the mentally, morally, and physically degenerate: the lower working class and the criminal.[30] It was partly towards identifying this social group that Galton developed his method of composite portraiture. In his opinion, the criminal tended to be of a deficient conscience, have weak self control, possess 'vicious instincts' and that the 'criminal nature' was inherited.[31] The method of composites could also be used to further Galton's aim of a programme of positive eugenics:

> It is the essential notion of a race that there should be some ideal typical form from which the individuals may deviate in all directions, but about which they chiefly cluster, and towards which their descendants will continue to cluster. The easiest direction in which a race can be improved is towards that central type, because nothing new has to be sought out. It is only necessary to encourage as far as practicable the breed of those who conform most nearly to the central type, and to restrain as far as may be the breed of those who deviate widely from it. Now there can hardly be a more appropriate method of discovering the central physiognomical type of any race or group than that of composite portraiture.[32]

Galton did, however, realize that his method was difficult to utilize on a large scale — individuals had to be specially photographed.[33] He constructed many composites in the late 1870s and 1880s, two of the main investigations being on criminals and phthisical (tubercular) patients.[34] He devoted half of his 1877 address to the British Association to a discussion of the application of his techniques to criminals and in 1878 exhibited composites of them to a meeting of the Anthropological Institute. In this case he obtained a negative result — the 'villainous' peculiarities had disappeared and left the 'common humanity' underlying them. Similarly, a negative result was obtained in an attempt to ascertain the distinct facial characteristics of tubercular patients. These failures did not, however, sway Galton's judgement of the usefulness of his method.

Galton also considered his method to be "a fertile field of research to the ethnologist" and at the York meeting of the British Association in 1881 gave a paper on the use of composite portraiture for anthropological purposes and exhibited a composite of skulls of Andaman Islanders[35]. In considering Galton's attempts to use his method for ethnological purposes we must remember that he was steeped in the racial anthropology of mid- and late nineteenth century Britain, with its concentration on skull forms, physical features, and representative 'types' of races. Further, we should recall that Galton was himself a keen traveller, particularly in Africa, and had closely observed and

written about racial differences from within the framework of Victorian anthropology. It is in regard to its use in ethnological work that Jacobs and Galton collaborated to use composite portraiture.

The idea that there existed a distinct Jewish face was, of course, one which had been in common use for centuries, just as other stereotypes such as 'all Jews are rich' were prevalent. In his search for evidence of the racial purity of Jews, Jacobs sought to place these subjective assessments on a firmer basis. In 1883 he enlisted Galton's aid in producing composites of Jews after he had read of the method in Galton's Inquiries:

> thanks...to Mr. Galton science has been enabled to call in the aid of photography to obtain these averages which no measurements can supply. Some two years ago I applied to him to know whether he would assist me in obtaining composites of Jewish faces, and to this he was kind enough to consent.[36]

The photographs out of which the composites were compiled were taken of boys at the Jews' Free School in the East End of London. In Jacobs' opinion the composite containing the largest number of components had what he termed a 'Jewish expression'. This was, he argued, due to the combination of characteristic types of nose, lips, and eyes. The composites of Jewish boys in general were, he said, "more than curious, they carry with them conclusions of scientific importance."[37] Thus, in Jacobs' view the composites of Jews exhibited the essential characteristics of Jews as a race. Indeed, these composites were the most important made by Galton and convinced him that the future of composite portraiture lay in ethnological and 'genetic' work.[38] As in the case of his other evidence of racial purity, Jacobs did not shrink from suggesting environmental reasons why the Jewish face was as it appeared, stating that

> The actual expression in the various composites varies to some degree, and it is a doubtful point whether the peculiar intensity of the Jewish gaze is not due to long residence in ghetti and accompanying social isolation. I fancy at least that it disappears to a large extent in Jews who pass very much of their life among Gentiles.[39]

Jacobs was never, however, very precise about what Jewish traits were determined by heredity and which by environment. This ambiguity runs through all of his writings on the racial, physical and intellectual characteristics of Jews.

"A Little Poland in the East End of London"[40]

There are two interrelated questions which are of central importance to an understanding of why Joseph Jacobs sought to investigate the racial purity of Jews, as well as their social and intellectual characteristics. First we must pose the question of why Jacobs conducted his studies at all. Unquestionably they involved the assembly of an enormous amount of data and his direct participation in obtaining physical measurement of Jews. Should this simply be seen as the desire of a Jew with an interest in anthropology to investigate his own social group? As I argue below, this only provides a partial answer. To gain a fuller understanding it is necessary to turn our gaze from the confines of the Anthropological Institute and consider particular features of British society as a whole, and the Jewish community in particular, in the 1880s and 1890s. Secondly, I want to ask in what ways Jacobs' studies were constituted. Why did he ask some questions and not others? Why did the answers which he produced take the form they did? Why were details of the social, physical, and intellectual characteristics of Jews so important at this time?

The argument that the Jews constituted a pure race appealed to Jacobs partly because of his position within the Jewish community. The late nineteenth century saw the emergence of an aggressively self-reflective flourishing of Jewish intellectual life in Britain.[41] Jewish intellectuals in London saw themselves as part of a social group which had been labouring under the yoke of oppression for centuries, and which still suffered the remains of that prejudice in Britain and the full

force of it on Continental Europe. The investigation of Jewish history, culture and ideals which was undertaken by Jacobs and others, was a response to the collective historical experience of Jews. The explanation of all kinds of questions relating to Jews was a means of building a cohesive self-conscious Jewish community. It was as part of this reconceptualization of the history, culture, and characteristics of the Jewish people that Jacobs investigated whether Jews formed a distinct race. Jacobs was one of the central figures in this flowering of Jewish intellectual life, founding the Jewish Historical Society, helping to organize and edit the catalogue of the Anglo-Jewish historical exhibition of 1885, writing histories of Jews in England and Spain. His was a 'radical' Jewishness, one might say almost 'fundamentalist' — he claimed that

> I am inclined to support the long standing belief in the substantial purity of the Jewish race, and to hold that the vast majority of contemporary Jews are the lineal descendants of the Diaspora of the Roman Empire.[42]

This is not, however, the whole story of Jacobs' intentions in undertaking his studies. We must consider some particular events which intruded upon the social, political and economic life of late Victorian Britain which deeply concerned Jacobs.

The late 1870s and 1880s was a period of extreme anxiety for the Jewish community in Britain. This period saw a marked resurgence of anti-Semitism in Europe, particularly in Germany, Western Russia and Poland. There are two aspects of this anti-Semitism which are of particular relevance in the present context. First, from the beginning of 1880 an intense anti-Semitic campaign was waged in Germany. Anti-Semitism had, of course, deep roots in German thought and in the early nineteenth century there was born what one historian has termed The Aryan Myth. Speculation on the origins of races was endemic in nineteenth century anthropology and the view that there existed a superior Aryan

race formed a particular strand within this speculation. The theory of Aryan superiority rapidly became internationally accepted and was propagated amongst the masses of Continental Europe, mainly in support of anti-Semitic campaigns.[43]

Throughout the late nineteenth century there was widespread speculation concerning the characteristics of Jews. There was intense discussion of questions such as whether Jews increased in number more rapidly than others, whether they could only exist in some parts of the world and not others because of climatic variations, and whether they possessed any particular advantages or disadvantages.[44] One of the main figures in the anti-Semitic agitation in Germany was the noted historian Heinrich Von Treitschke who succeeded in carrying the agitation into the universities after 1879. Von Treitschke was a German patriot who was most influential among the student youth of the period, and subscribed to a view that the Aryan 'race' stood at the pinnacle of the development of the human species. In the company of other scholars and pamphleteers he engaged in a vitriolic campaign against Jews in Germany.

This rise of anti-Semitism in Germany deeply shocked and troubled the Jewish community in Britain. The depth of concern which was felt can be gauged by reports of the agitation in the Jewish Chronicle. From early 1880 until mid-1881 many editorials were devoted to the situation in Germany, as well as countless news reports being published from the pens of correspondents. Besides this, it published translations of attacks on anti-Semitism by German scholars such as, for example, the naturalist Karl Vogt.[45] Jewish intellectuals in Britain were also active in condemning events in Germany. For example, Jacobs' friend and fellow member of the 'Wandering Jews', Lucian Wolf, gave lectures and published articles in order to bring events in Germany before the British public.[46] Wolf argued that

> The wave of anti-Jewish Agitation which is now sweeping across almost the entire world...has reached the fiercest and most significant torrents in Germany.[47]

He claimed that the main arguments put forward by the major agitators, such as Von Treitschke, were that Jews were taking over positions of power in German society, such as ownership of the press and sought to subjugate the Teutonic race.[48] He also outlined past outbreaks of anti-Semitism in Britain and argued that such agitation had recently been recommenced in Britain by Professor Goldwin Smith.[49] Goldwin Smith was Professor of Modern History at Oxford and had published an article questioning whether Jews could be patriots. The immediate context of this was the massacre of Bulgarian Christians by Turks. Following traditional policy the Prime Minister, Disraeli, supported the Turks. For the opposition, Gladstone supported the Christians. It was against this background that hostility towards Disraeli, who was born a Jew, began to appear, with allegations that he had been led astray by his Jewish background. A tempestuous exchange ensued in the periodical press and the Chief Rabbi wrote defending Jews.[50] At the time when Wolf's lecture was published in the Jewish Chronicle in 1880, the letter columns were full of opinions on the theme of Gladstone's attitude to Jews and of whether Jews could be patriots. These incidents demonstrated that the Jewish community in Britain was exceptionally sensitive to any hint of anti-Semitism and reacted strongly to any such outbreak, either at home or abroad.[51]

No sooner had the anti-Semitic agitation begun to subside in Germany than reports began to filter into the columns of the Jewish Chronicle of atrocities being committed against Jews in Russia.[52] This signalled the beginning of what was to be the main source of anxiety for the Jewish community in Britain during the 1880s and 1890s — the large increase in the number of Jewish immigrants to Britain from the Continent.[53] Bouts of savage persecution had been frequent in Russia and Poland

throughout much of the nineteenth century and the one which occurred at this time followed a common pattern.[54] The persecution which began in the 1880s followed the assassination of Czar Alexander II on 13 March 1881. Within a month a wave of terror engulfed the 'Pale of Settlement', an area to which Russian Law restricted many Jews. Following this, and the enactment of the 'May Laws', which further restricted the rights of Jews, large numbers of Jews began to flee. Although the majority of those who did not find permanent refuge on the Continent had as their goal emigration to the United States, many aimed to settle in Britain and many more remained in Britain although originally intending to cross the Atlantic. In total, it has been estimated that over 120,000 Jewish immigrants settled in Britain in the period 1880-1914. Throughout the 1880s immigration continued, and a second peak in numbers fleeing was reached in 1886 when Jewish Poles were expelled from Russia and another in 1890 following on intensification of repression in Russia. Further bouts of repression continued to the turn of the century and beyond.

In Britain the pogroms of 1881 and 1882 were the subject of great concern among the Jewish community. Initially, financial help for the immigrants, the majority of whom were very poor, was provided by the Jewish Board of Guardians, an organization which had been set up in 1859 to provide coordinated relief for the Jewish poor.[56] In 1882, however, aid was sought from the wider community and a fund was set up (the Mansion House Fund) to provide relief for the victims of persecution. The fund was administered by a joint committee consisting of a group representing the fund and a group representing the Board of Guardians. This joint committee became known as the Russo-Jewish Committee in 1890. Throughout the 1880s and 1890s this body provided relief for poor immigrants.[57]

The established Jewish community were not, however, simply concerned about the state of the immigrants; they also feared the effects of the

immigration on their own position. The solidity and stability which the Jewish community and its institutions had attained by the middle of the nineteenth century in Britain reflected the position of its dominant group. A few interrelated families comprised the ruling elite of the community. This group was religiously observant and contributed both time and money to Jewish affairs. Socially and economically they were quite homogeneous, their occupations generally lying within banking, stock-broking and wholesaling.[58] They were, however, still apprehensive about their position within English society as a whole, particularly because Jews in other countries had not achieved the same degree of acceptance. When, therefore, immigrants began to flood into Britain, they felt themselves threatened; their hard-won social acceptance and economic position were at risk. The Jewish Chronicle, organ of the elite of English Jews, voiced their fears openly and relentlessly. In 1881, for example, it stated in an editorial that the immigrants

> ...form a community within the community. They come mostly from Poland; they, as it were, bring Poland with them, and they retain Poland while they stop here. This is most undesirable, it is more than a misfortune, it is a calamity...Our fair fame is bound up with theirs, the outside world is not capable of making minute discrimination between Jew and Jew, and forms its opinions of Jews in general as much, if not more, from them than from the Anglicized portion of the community.[59]

The presence of the immigrants instilled a fear in the Anglo-Jewish elite that their position in British society was at risk and that there was a possibility of a rise of anti-Semitism, which would of course affect them as well.

The investigations of Joseph Jacobs should be read against the background of the anti-Semitic agitation in Europe and its effects in Britain. First, we can ask what Jacobs' attitudes were to these events. From the late 1870s until the end of the century Jacobs was one of the leading figures in Jewish intellectual life in London. As noted above, he was involved in writing Jewish history, and helped organize the Anglo-Jewish exhibition. Jacobs was also heavily involved in the activity

which followed the tide of concern over the pogroms in Russia. In The Times of 11 and 13 January 1882, Jacobs published articles under the title "The Persecution of Jews in Russia". This was a passionate rendition of the recent events there and detailed the atrocities which were being committed on Jews.[60] He called on the Russian government to intervene in the cause of 'civilization and humanity' and charged that local government was integrally involved in the outrages. He was also concerned to refute charges that Jews controlled many occupations and a great deal of land. His purpose was outrightly propagandistic:

> It is time that the English public should become aware of the character and extent of the persecutions which the Jews of Russia have undergone in the past year.[61]

Jacobs succeeded in his aim to a large extent and outraged voices resounded around the clubs and residences of wealthy London. It was largely as a consequence of Jacobs' articles that the Lord Mayor was pressed to call a meeting at the Mansion House and set up the Mansion House Fund.[62] It was perhaps fitting that it was Jacobs who was Secretary of the Fund from 1882-94.[63] Jacobs continued his publicist activities and in 1890 published a pamphlet, issued by the Russo-Jewish Committee, which presented an updated version of the atrocities in Russia and of what could be done to halt them.[64] At this time Jacobs was also involved in attempts to bring to a halt anti-Semitism in Germany, publishing a bibliography of anti-Semitic writings as an aid in this in 1884. This was also a subject which affected him deeply, not only because he was Jewish, but also because he had studied in Germany and his teacher there played an active role in confronting the anti-Semites.[65]

In pursuing his studies of the physical, intellectual and social characteristics of Jews Jacobs sought, by the use of statistical analysis, anthropology and psychology, to aid the immigrant cause and to attempt to defuse the possibility of anti-Semitic feeling in Britain. By means of anthropological and psychological arguments he attempted to demonstrate

that Jews were not an inferior race; by means of statistical analysis of the Jewish population of London he sought to refute the commonplace stereotype that all Jews were rich, or that they tended to be concentrated in one or two occupations. In the preface to the collection of his studies published in 1891 Jacobs made explicit his intentions in pursuing them:

> The following studies began in an attempt to get reliable data about the Jews of Europe when the anti-Semitic movement was at its height. In going through the literature of the subject, of which I have published a bibliography ("The Jewish Question 1875-85") I was struck by the paucity of trustworthy evidence, both among Jews and their opponents. The subject once entered upon, I got interested in it, apart from its polemical bearings, and I collected at the time (1882-3) a mass of materials of all kinds.[66]

Jewish Ability

In his attempts to refute anti-Semitic arguments Jacobs turned to anthropology partly because a great deal of continental anthropological literature had for decades been pervaded with anti-Semitism.[67] This literature was prominent in the agitations of the late 1870s and 1880s in Germany. Indeed, arguments based upon anthropology constituted one of the main supporters in the anti-Semitic case. In a lecture on anti-Semitism in Germany, Jacobs' friend Lucien Wolf explained to his audience that although anti-Semitic arguments in Britain centred on the question of whether Jews could be patriots, those in Germany had a different basis:

> There it is sought to vindicate it scientifically, and the doctrines by which its leaders affect to be guided are immutable principles of ethnology and economy.... the German agitation has had its origin in the popular appreciation of universal and immutable principles of science.[68]

It was precisely to challenge the justification for anti-Semitism provided by ethnology that Jacobs pursued his studies in that direction and tried to demonstrate that "the immutable principles of science" supported the belief that the Jewish race was not inferior.

One of the other main charges made against Jews in the agitation in Germany was based upon a formally contradictory set of attitudes. On the one hand it was argued that Jews were mentally inferior to those of 'Teutonic' or 'Aryan' descent; and on the other, that Jews occupied positions of power in Germany. These two strands of thought existed in an uneasy relationship in the anti-Semitic frame of mind, one which proved to be readily exploitable by those confronting them. One widespread assertion was that Jews did not contribute anything to societal advancement. In 1884 The Spectator declared:

> What have they, as a race, contributed since the advent of Christianity, to the progress and elevation of mankind?[69]

Similarly, in 1888 the German anthropologist Gustav Le Bon wrote that:

> The Jews have neither arts, nor sciences, nor industries, nor anything which constitutes a civilization. They have never brought the least contribution to the development of human knowledge.[70]

In 1881 the naturalist Karl Vogt, who was an active member of those opposing the anti-Semites, published an article in which he defended Jews against charges of being, among other things, lazy and unintelligent. He argued that

> The Jews govern the money market, and hence the bourse, commerce, and credit. Very likely, but how should such a small minority be able to do so if they were not endowed with superior mental faculties, and did not work with greater endurance and energy? The Jews occupy more places in office, they number more lawyers, more physicians, than they have in proportion (to the general population).[71]

Over the next few years the Jewish Chronicle published notes, articles and editorials which followed this line of thought. One month after the publication of Vogt's article in the Jewish Chronicle appeared an editorial, written by Jacobs, entitled "Jewish Ability".[72] Here he argued that

> The gist of the anti-Semitic complaints against the Jews consists in an indirect admission that the Jew is too clever for the Teuton...It becomes of interest to discover how the unerring laws of history have tended to make the Jews cleverer than some of their neighbours, and thus to compensate them for the long ages of persecutions through

> which they have passed...any explanation must assume the theory of heredity which declares that the ability of the individual is in reality the experience of the race.[73]

Jews, he claimed, had more practical ability and sharpwittedness and by providing a long list of eminent Jews in various fields of study, and in professions such as medicine, argued that Jews are in fact intellectually more able than non-Jews. This 'fact' arose in part from their historical experiences — their selection in "the struggle for existence". In this way he used his opponents' tools to attack them.

Jacobs considered the ability of Jews to be the result of the nature of Jewish society: its compulsory education and intense study of the Talmud (which 'trained the mind'):

> In the final resort it is to the Jewish religion that Jewish ability is due, indirectly by enabling these historical causes to operate, and directly, by many of its provisions.[74]

This was the beginning of a programme of research by Jacobs which was at the same time a polemical campaign against anti-Semitic denunciations. One of the main strands in this campaign was to demonstrate that Jews were not intellectually inferior by means of a study of Jewish contributions to civilization. He wrote that

> an estimate of contemporary contributions to the world's progress is an essential part of the Jewish defence. Against the vague anti-Semitic denunciations of Jewish characteristics, which are mainly the results of prejudice and, in any case, cannot be checked or measured, we can here set down the definite results of Jewish achievement. We can even go further and, by the aid of modern statistical science as developed by Pearson and Galton, arrive at some measurable comparison between the output of Jewish ability and that of others. The science of probabilities even enables us to go further and to determine, with some precision, the probable proportions of Jews of different ranks of ability, which would otherwise not be measurable.[75]

Jacobs did not conduct his campaign on his own. He had the active support and aid of Asher I. Myers, proprietor and editor of the Jewish Chronicle. Jacobs was a close friend of Myers, dedicating the republished collection of his Studies in Jewish Statistics to him in recognition of

his assistance in conducting the studies and who, Jacobs tells us, first suggested them.[76] After Jacobs wrote his first editorial on Jewish ability, the Jewish Chronicle published many variations of the argument which had been laid out by Jacobs, including other articles by him. His Studies in Jewish Statistics was first published there in thirteen weekly parts during 1883-4. In 1884 in reply to the above quoted assertion from The Spectator, Jacobs argued that Jews had contributed a great deal to medicine, music, and poetry.[77] In 1885 the Jewish Chronicle published a page length report of Jacobs' paper to the Anthropological Institute, as well as an editorial which discussed it![78] Two months later it published articles on two successive weeks detailing Jacobs' and Galton's articles in Photographic News dealing with composite portraits of Jews.[79] Again, in September of that year it published a report of Jacobs' paper on 'A Comparative Estimate of Jewish Ability', read before the Aberdeen meeting of the British Association. The following week it included an extract from the paper.[80] Finally, in November a report appeared of Jacobs' paper given to the Anthropological Institute on Jewish ability.[81] What this amounts to is a concerted campaign by Jacobs and Myers to provide material to help refute the arguments of the anti-Semites in Germany, as well as the occasional outburst in Britain and also to forestall the rise of such a movement at home. The audience for his British Association and Anthropological Institute papers may have been academics and cultured middle class gentlemen, but these were precisely the type of people in the forefront of the campaign in Germany.

In March 1881 Jacobs wrote one further editorial, entitled 'Jewish Statistics' in which he stated that

> On all the questions that are more nearly interesting to English Jews definite answers are wanting because there is lacking the foundation of all statistical reasoning — the vital statistics of the community.[82]

It was with the aim of remedying this situation that Jacobs embarked upon

detailed studies on this theme. As I argued above he had already set out arguments in qualitative terms; now he wished to produce quantitative evidence.

The Politics of Biography

In order to counteract the generally vague claims of anti-Semites both abroad and in Britain, Jacobs set out to demonstrate by means of sound scientific evidence that Jews were not an intellectually inferior race. He made two attempts at this. His first was in a paper entitled 'The Comparative Distribution of Jewish Ability', which was read before the Anthropological Institute in November 1885.[83] In this paper Jacobs endeavoured to arrive at an estimate of the 'intellectual ability' of Jews as compared with other Europeans. In this task he recognized that he faced a problem: how to find an objective measure of intellectual ability. His solution was to utilize Galton's 'biographical' method, detailed in Hereditary Genius:

> It was necessary to find some method that would give definite results and should have at the same time claims to scientific accuracy and trustworthiness. Fortunately for me such a method had been before the world for the last sixteen years in Mr. Galton's Hereditary Genius and what I shall do in this investigation is only to apply to Jews the same line of argument that he applied to Englishmen in that well-known book.[84]

It will be recalled that in Hereditary Genius Galton's main aim was to demonstrate that 'Genius' runs in families and that his procedure for doing this was to demonstrate that in a large number of instances men who had achieved noted positions in life had eminent relatives.

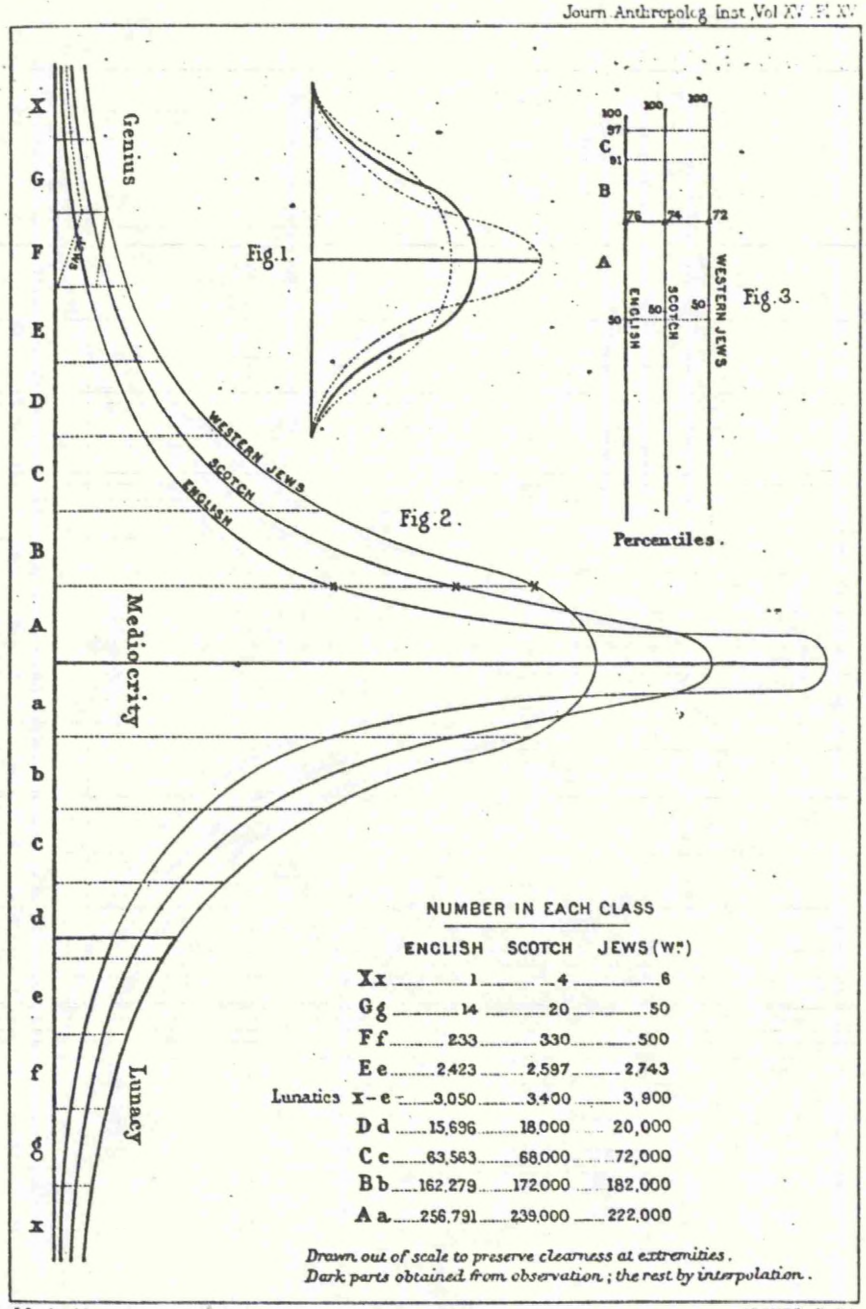
In his own study Jacobs followed Galton's method very closely. He attempted to arrive at an estimate of the number of eminent Jews over fifty years of age who lived between 1785 and 1885 (the year he was writing). He estimated that this amounted to one and a half million. By extrapolation from Galton's figures and assuming that the Jewish intellect is equal to the English, one should expect to find in

dictionaries of biography 1 illustrious Jew, 21 eminent ones, and 350 distinguished ones.[85] Since, however, Jews live throughout Europe he argued that it would not be fair to confine attention, as Galton had done, to a British biographical dictionary. In addition, Jacobs consulted similar works from France, Italy and Germany. By means of this procedure he collected the names of 335 distinguished Jews but then proceeded to discard 50% of them, since not all deserved this status.[86] In the first rank (Galton's class X) Jacobs placed four Jews, rather than the one and a half there should have been if the Jewish intellect was equal to the English one (see Figure 1). In the second rank (class G) he placed 25 Jews, giving a figure of 17/million rather than the projected 14/million. In the first two classes, therefore, there are 29 illustrious and eminent Jews among a million and a half, where one would only have expected 22 or 23 of equal calibre among the English. Hence, it would seem that Jews have a quarter more people of great intellect than the English.[87]

When he came to examine the number of Jews in the third class of intellect (class F), however, Jacobs found that there were only 99 Jews, whereas there were 233 English. He wrote:

> There seems to be a discontinuity in the Jewish curve, indicated by the sudden drop in the dotted curve at class F [see diagram] , which casts doubt on our whole method, and certainly traverses the directly favourable conclusion we were first inclined to draw in favour of Jewish ability.[88]

The implication here was that although Jews possessed more people of very high ability than English people, they possessed far fewer of slightly lower ability. This conclusion was fundamentally unacceptable to Jacobs, who sought from the very beginning of his interest in this subject to demonstrate that Jews were not intellectually inferior, as indeed, he had already claimed in the Jewish Chronicle a few years previously.[89] Rather than accept the conclusion, Jacobs attempted to find causes for the low number of Jews in class F, claiming that the explanation was 'tolerably obvious'. Part of his answer lay in his observation that he had assumed



DISTRIBUTION OF ABILITY
AMONG
ENGLISHMEN, SCOTCHMEN & JEWS

FIGURE 1 (from (Jacobs: 1885d, 279))

that Jews and Englishmen began on the same footing in 'the race for fame'. This, however, he now claimed was only true for the one third of European Jews living in Western Europe; the two thirds of European Jews living in Russia and Romania were heavily handicapped by anti-Semitic prejudices. If Russia had contributed the 'proper' proportion to the 335 Jews on Jacobs' list of eminent people there would be 200 Russian Jews, but in fact there were only 8.[90] If, therefore, this was taken into consideration, and Englishmen compared with Western Jews only, the first two classes number nearly as many as among Englishmen, and the third class shows one quarter more Jews than Englishmen. Even here, however, Jacobs argued that there was a discrepancy and that the comparative paucity of the third class of Jews had to be accounted for. In other words, Jacobs was quite simply unwilling to believe that Jews were not as intellectually able as Englishmen. To account for the low number of Jews in the third class Jacobs argued that the social, political and economic situation of Jews in Western Europe had been the cause of this situation. It was, he argued, precisely this group of Jews which was likely to be 'kept down' by 'moderate persecution', as there had been in this area. He conjectured that without the burden of this persecution there would have been nearly as many more in the third class as there were in the first two classes of Jews. Overall, taking into account both 'corrections', Jacobs concluded that there was about twice as much chance of finding a distinguished man among Western Jews as among Englishmen.[91]

For comparative purposes Jacobs applied the same biographical method to Scotsmen, utilizing the Book of Eminent Scotchmen. His results showed that Scots held a position superior to Jews in general, including those from Russia, but intermediate between Western Jews and Englishmen.[92] Finally, Jacobs applied Galton's method of percentiles to compare English, Scots and Jews, and found that the 72nd Jew was equal in ability to the 74th Scotsman and the 76th Englishman. Thus, a 'real comparative estimate

of Jewish ability' is that the average Jew is 4% more able than the average Englishman, and 2% more able than the average Scotsman.[93]

Although confessing that he did not lay much stress on the precision of this result Jacobs still considered that it was valid in a comparative sense. Thus, contrary to anti-Semitic propaganda, he had demonstrated that Jews were not intellectually inferior with respect to other civilized people; this he had shown by a 'scientific' analysis. He now moved on to consider what the causes of this Jewish superiority were. His answer to this coupled the social conditions in which Jews lived with the effects of persecution:

> What are the causes of Jewish intellectual superiority? We have to take account of their residence in cities, which is always more conducive to intellectual life. From this too follows their tendency to commerce, rather than industry, and as the former implies headwork, and the latter handicraft, mental capacity must be aided by this fact. The care Jews give to their child's education is well known and must help...The weaker members of each generation have been weeded out by persecution which tempted or forced them to embrace Christianity, and thus contemporary Jews are the survival of a long process of unnatural selection which has seemingly fitted them excellently for the struggle for intellectual existence.[94]

Jacobs' Social-Darwinian arguments are, of course, quite unexceptional for this period, except that he was dealing specifically with Jews. This is only one example of how Social-Darwinian arguments could be used to either attack or defend the immigrant.[95] Having produced a result conforming to his preconceived views, Jacobs set out to place it on a firmer basis by means of measurements made directly on <u>individual</u> Jews. In this he followed the path which Galton had trodden ten years earlier, passing from biographical analysis to a science of the mind.[96]

<u>Nature, Nurture and the Immigrant</u>

One of the main themes in Jacobs' studies of Jews was his attempt to argue that any deficiency or inferiority on the part of Jews was due to nurture rather than to nature. In considering whether nature or nurture

determined a person's abilities Jacobs again relied heavily on the work of Francis Galton.

Galton's interest in 'nature versus nurture' grew up in the course of his studies for Hereditary Genius. In the years following its publication he investigated this question in some detail. When he came to write English Men of Science in 1874, Galton had not yet succeeded in constructing a method to gauge the relative effect of nature and nurture on a person's abilities. In this book his aim was to supply a 'Natural History of English Men of Science', describing their earliest ancestors (including hereditary influences), the causes which first led them to study science and the education which they had received.[97] Here he stated that

> Nature is all that a man brings with himself into the world; nurture is every influence from without that affects him after his birth.[98]

Although he argued that environment can slacken or thwart hereditary tendencies, or implant wholly new ones, he was unable to arrive at an assessment of the relative influence of heredity against environment:

> The effects and circumstances are so interwoven with those of natural character in determining a man's position among his contemporaries, that I find it impossible to treat them wholly apart. Still less is it possible completely to separate the evidences relating to that portion of a man's nature which is due to heredity, from all the rest Heredity and many other cooperating causes must therefore be considered in connection.[99]

Subsequently, however, it occurred to Galton that an investigation of sets of twins could help him to solve this problem. Although there was material in existence dealing with resemblances between twins, he could find nothing directly relevant to his own purposes. Because of the resounding success of the questionnaire which he had distributed for English Men of Science, Galton decided to adopt a similar approach for the subject of twins. Accordingly he circularized twins, and relatives of twins, known to him. These were in turn asked to supply the names of twins known to them. In his questionnaire Galton quizzed them about such

things as physical resemblance, susceptibility to illness, taste and disposition and whether they had been brought up in the same environment. In total Galton received 94 replies.[100] These investigations convinced him of the overwhelming dominance of heredity rather than environment:

> The impression that all this evidence leaves on the mind is one of some wonder whether nurture can do anything at all, beyond giving instruction and professional training ...There is no escape from the conclusion that nature prevails enormously over nurture when differences in nurture do not exceed what is commonly to be found among persons of the same rank of society and in the same country.[101]

Thus, when Jacobs came to investigate the question of nature and nurture with respect to Jews, he could once more draw upon material already collected by Galton. This was yet another way in which Jacobs' work was an application of Galton's ideas for a particular political purpose.

In 1889 Jacobs published a paper entitled 'On the Comparative Anthropometry of English Jews' in the Journal of the Anthropological Institute. This paper was co-authored with Jacobs' close friend Sir Isadore Spielman. Spielman was the organizer of the Anglo-Jewish Historical Exhibition of 1877 in which Jacobs had also played a prominent role. Like Jacobs, Spielman was a member of the Jewish intellectual elite and was similarly concerned with the outrages in Russia. With Jacobs he edited a supplement to the Jewish Chronicle entitled Darkest Russia when the atrocities were at their height.[102] In their paper to the Anthropological Institute Jacobs and Spielman gave details of measurements which they made concerning the physique, sensory and physical capacities of Jews in London. For several weeks at a time they set up a laboratory at the Jewish Working Men's Club in the East End and at a venue in the city's West End.[103] In total 423 people passed through the laboratory. The activities of this laboratory are familiar; they were, as Jacobs and Spielman stated

> carried out on lines as far as possible parallel to Mr. Galton's classical experiments at the International Health Exhibition of 1885.[104]

For several weeks they had equipped a room in a manner as closely resembling Galton's laboratory as possible. They measured height, both sitting and standing, weight, chest circumference, colour of eyes and hair, breathing power, strength of pull, strength of stronger hand, keenness of sight, judgement of eye, colour sense, and hearing. They also obtained measurements of the length and breadth of head, inventing an instrument for this purpose.

Jacobs' and Spielman's aim in conducting these tests was clearly set out in their paper. They claimed that the people whom they tested were average samples of the two chief classes into which English Jews could be divided:

> These may be described as "West End Jews", the better nurtured inhabitants of the West End and descendants for the most part of Jews who have been long settled in this country, and "East End Jews", the less fortunately situated Jewish dwellers of the East End, the parents of whom in many cases were born abroad. As far as possible it was desirable to get out results for each of these classes separately, and for the most part we have done so. By this means we are enabled to make our results bear directly on one of the burning questions of anthropology, that of nurture vs. nature, to use Mr. Galton's convenient phraseology. For the "West End Jews" are ultimately derived from exactly the same race and class as the East End Jews, so that differences of race are totally eliminated, and we are enabled to trace the influence of nurture pure and simple. The problem of determining purely 'racial characteristics' will be considerably simplified if we can in this way determine what may be described in contradistinction as 'nurtural characteristics'. It is in this connection that our investigations appear to us to have a wider outlook than ordinary anthropometric results.
>
> Our method has been to contrast West End and East End Jews so as to get the influence of nurture. But besides this, there might be a residuum of race influence which could only be tested in comparison with another race. West End Jews might differ favourably in height from East End Jews and yet all Jews differ unfavourably in height from Englishmen, owing to original differences in race. Another comparison was therefore necessary in order to fully test our results and that was with Englishmen generally.[105]

For this purpose they compared the results which they had obtained with those collected by Galton in his laboratory. From the above passage it is clear that Jacobs and Spielman considered that they were furthering

Galton's work with respect to the nature versus nurture question and at the same time investigating whether Jews were racially inferior.

In the period which had elapsed since Jacobs began publishing his investigations of Jews, the threat towards Jews in Britain, as perceived by the established Anglo-Jewish middle class, had increased dramatically. The main cause of this was the number of Jewish immigrants living in London's East End — Jacobs' and Spielman's "less fortunately situated Jewish dwellers of the East End." The presence of the immigrants and their increase in numbers — both real and perceived — led to the growth of hostility towards them.[106] This hostility should be related to the coincidence of the period of immigration with a period of economic crisis in London's East End. A series of hard winters and a trade depression highlighted and reinforced the long-term tendency to industrial decline.[107] The sudden increase of the number of immigrants exacerbated the social problems of the area.[108] The opposition to Jewish immigration which was voiced in the East End centred on different issues at different times.[109] Down to the late 1880s the emphasis was on the labour market in which it was widely alleged that immigrant Jews undercut British workers. A large number of immigrants sought their livelihoods in a rather narrow range of trades, such as clothing and boot and shoe making (usually referred to as the 'sweated trades') working long hours in cramped, unhealthy conditions. It was argued that immigrants would work for longer hours and tolerate much worse working conditions than other workers. Therefore, it was alleged, they not only took jobs from other workers, but also because of their tolerance of low pay, depressed wage levels as a whole.[110]

The other main source of hostility centred on the housing market in the East End; this opposition was more widespread in the late 1880s and 1890s. In the late nineteenth century overcrowding was endemic in London's East End. A steep rise in rents, low wages, precarious

employment, and a shortage of housing provided the impetus for concern. The effects of the housing shortage led the indigenous population to blame the immigrant. It was in the heart of the immigrant (i.e. Jewish) community that the greatest degree of overcrowding existed, and their willingness to pay more for accommodation quickened the pace of displacement of the existing population, increased overcrowding and sped the rise in rents. Foreign - that is, Jewish - landlords were also blamed and hated for the problems. The commonest view was that the single most important factor in the housing problem was immigration.[111]

There were, however, other sources of anxiety on the part of the indigenous population. One was the immigrants' 'strange' way of life: their living habits, dress and customs. The changes in shops and in the general character of the community appeared to be a threat to the 'English way of life' and were bitterly resisted.[112] Another source of hostility lay in the perceived 'nature' of the immigrants. Concern was expressed about their social, moral and physical compatibility with life in Britain. Furthermore, a proportion of the arguments hostile to immigrants were conducted within an <u>implicit</u> Social-Darwinian framework. In the case of the immigrants, as in that of the poor in general, much of the debate was conducted in terms of the Victorian characterization of humans on a continuum from civilization to savagery. The often dirty and dishevelled appearance of the immigrants, the atrocious living conditions which they tolerated, their low standard of hygiene, their strange customs, and their inclination to speak in Yiddish all lent weight to arguments conducted on an implicit scale of superiority-inferiority.[113] For example, before the Select Committee on Alien Immigration of 1888 Arnold White, one of the main figures in the anti-alien agitation and a fervent Social-Darwinist, described the immigrants as being of "the lowest type," and defined his position as:

> I mean persons who...have no regard to any provision for sanitation, and scarcely any regard for cleanliness and for whom the conditions of life are very low; those who are comparatively indifferent to anything outside the mere sensual indulgence of eating, drinking, and sleeping, and those who have no hope or ideal in life, no pleasure in the past and no amusements, and who most nearly approach the condition of animal life.[114]

The strand of thought which emphasized the hazards to the health, physical efficiency, and morals of the nation emanating from Jewish immigrants was also manifested in the popular press.[115] In February 1886 the Pall Mall Gazette claimed that

> the foreign Jews of no nationality whatever are becoming a pest and a menace to the poor native born East Ender... fifteen or twenty thousand Jewish refugees of the lowest type...have a greater responsibility for the distress which prevails [in the East End] than probably all other causes put together.[116]

In April the following year the St. James Gazette attacked Jewish immigrants, grossly inflating the figures collected by the Board of Guardians five-fold. It followed this with a series of articles which charged that the immigrants were immoral, a source of vice, a heavy charge on the rates and a

> colony of 30,000 or 40,000 steeped to the lips in every form of moral or physical degradation,...[the] vast majority are nihilists or anarchists of the very worst type.[117]

By May the series had received the title 'Jewish Pauperism', and other papers such as the Spectator and East London Observer began to identify their positions. In November 1887 the Observer declared that:

> The want of funds and of physical and mental inability should be made the reason for refusing to admit foreigners.[118]

The implication that the immigrants lacked proper morality and might therefore pose a threat to English people was also voiced widely. In an anti-alien tract issued under the editorship of Arnold White in 1891 the Rev. G.S.Reeney, in a chapter 'The Moral Aspect', stated that

> The Alien notwithstanding many virtues, seems to bring a sort of social contagion with him which has the effect of seriously deteriorating the life of those who are compelled to be his neighbour...the neighbourhood in which he settles speedily drops in tone, in character, and in morals.[119]

The agitation and concern which arose in the 1880s was manifested in the appointment of a select committee on immigration in 1888, which heard evidence from ministers, trade unionists, employers, employees, doctors, sanitary inspectors, prominent Anglo-Jews. Also in attendance were fifty immigrants selected for their peculiarly 'depraved and destitute' appearance by Arnold White, who paid each 5 shillings to attend in order to have an effect on the committee![120] The Social-Darwinian overtones of the agitation against Jewish immigrants formed part of a wider rise of such doctrines in the 1880s and which were variously applied to describe the poor, ill, unemployed, those living in squalor, and by means of crime.[121] It is against the background set out above that Jacobs' and Spielman's work should be set.

The result of the measurements made by Jacobs and Spielman was that visitors to Galton's laboratory scored highest in all tests except weight and keenness of sight. They analysed their results using Galton's method of percentiles, using the 5th, 25th, 50th, 75th, 95th percentile in each case. They defined the extremes as the "range" and the middle number practically the medium or average. Their results appeared to show that Jews in general compared unfavourably in almost all measurements with the English people who visited Galton's laboratory. Jacobs and Spielman did not, however, infer that Jews were inferior from this result. They argued instead that if only "West End" Jews are taken into account, these being of nearly the same class as visitors to Galton's laboratory, then the 'inferiority' vanishes; West End Jews differed by an almost inappreciable amount from visitors to Galton's laboratory. They claimed that it was therefore obvious that it was nurture rather than nature which produced the difference between the scores of East End Jews, and West End

and English people.[122] Jews and, in particular, immigrant Jews, were not a racially inferior group with respect to intellectual or physical attributes. Jacobs and Spielman were not, however, content to stop here and asked rather rhetorically if these results implied that it was only a difference of nurture which distinguished a "Hottentot from a Patagonian". Their answer was that this was not the case because although the means of West End Jews and visitors to Galton's laboratory were almost the same, the range of variation was different. From this they drew the general conclusion that

> long continued bad nurture through many generations shows its influence on the measurements of well nurtured descendants not only by reducing the average, but by restricting the range and preventing any very great variations from the artificially reached average.[123]

Hence they argued, the real test of whether a group of people was a race is to be found in extremes rather than averages — this being practically the way in which popular judgements about race are made. While anthropometric measurements depend on nurture, social conditions tend to preserve the same kind of nurture within a particular race, and if any change in the conditions of nurture occurs, as for example in the case of West End Jews, the pre-existing legacy of bad nurture tends to lower the range of variation in well nurtured descendants rather than depress the average.

Finally, Jacobs and Spielman dealt with head measurements and claimed that they had collected more material on this subject than any other observer of Jewish craniometry. By comparing their results with those obtained elsewhere in Europe, it appeared that English Jews were much more long headed (i.e. dolichocephalic), than those on the Continent. Did this therefore imply that English Jews were inferior, or had deteriorated, since it was the accepted view that dolichocephalism indicated this? Jacobs and Spielman were, of course, reluctant to draw this conclusion and argued firstly that their results had been distorted

by the inclusion of young men, and women; and secondly, that the cephalic index was not the best test of intellectual capacity. Instead, and following Galton, they regarded skull capacity as the best available means since the cephalic index was only a ratio rather than an absolute measure of skull capacity. Although they wished to follow the plan adopted by Galton and Venn in their examination of Cambridge undergraduates they were unable to measure the head heights, and so had to make do with comparing crude base areas of heads.[124] Their results were in conformity with their assumption that West End Jews were superior to East End Jews in 'intellectual capacity', this difference being due to nurture.[125] Thus, their painstakingly assembled results appeared to demonstrate that immigrant Jews were not innately inferior, they were not of the 'lowest type'. Rather, it was long ages of persecution which had lowered the physical and intellectual capacities of some of their number.

In this chapter I have discussed a concrete early attempt to enlist Galton's ideas about physical and mental ability in the service of a particular political campaign. In his extensive and laborious investigations Jacobs aimed to demonstrate that the view that Jews, in particular immigrant Jews, were in some way inferior was fundamentally in error — a product of anti-Semitic prejudice. He did this by utilizing existing anthropological theory and practice and Galton's biographical method and anthropometric tests. The main motivation in forming the construction of Jacobs' arguments was his fervent devotion to the Jewish cause, in the context of a rise of anti-Semitism in Britain and abroad. Galton's methods and ideas were only used because they meshed with a particular political climate in which they could be taken up by a particular interest group.

Chapter Five

Notes

1. The best source for biographical details is the entry under 'Jacobs' in the Jewish Encyclopaedia. Other sources are (Phillips: 1954), (Zangwill: 1916), (Wolf: 1916); (Harris: 1968).

2. As readers of J.G. Frazer's Golden Bough will appreciate, folklore was an integral part of anthropology in the late nineteenth century. For example, by an investigation of contemporary nursery tales and popular customs it was thought that knowledge could be gained of beliefs and habits thousands of years ago (Penniman: 1935, 66-67, 110-46). Jacobs also edited many editions of classic folk tales and his versions of many of these remain standard editions; on this see (Harris: 1968), whose memoir was occasioned by the reissuing of Jacobs' edition of some fairy tales.

3. (Zangwill: 1916) provides an informative, amusing and glowing appreciation of Jacobs which is constructed around the view that a historian of the future could understandably be mistaken in thinking that there was not one Joseph Jacobs but 'myriad upon myriad" of them. He notes that Jacobs often used to joke about having the longest entry in the British Museum Catalogue.

4. J. Jacobs, "London", Jewish Encyclopaedia, Vol.8, 170.

5. (Harris: 1968).

6. It should also be noted that a whole issue of the Transactions of the Jewish Historical Society of England was devoted to appreciations of Jacobs after his death in 1916.

7. (Jacobs: 1885c, 23). Jacobs repeated his arguments on the purity of Jews in his article 'Anthropology' in the Jewish Encyclopaedia, Vol.1, 619-21.

8. For a general discussion of nineteenth century racial thought see (Odom: 1967).

9. For good discussions of Victorian racial thought see (Biddis: 1979), (Lorimer: 1978).

10. He also presented evidence relating to birth, death, marriage rates and other 'vital statistics' which appeared to show that Jews differed in these characteristics from non-Jews. He was, however concerned to argue that such differences could be adequately explained by referring to social causes. (Jacobs: 1885c, 23-32; 1891, 49-59).

11. (Jacobs: 1885c, 39-51).

12. Ibid, 43.

13. (Stocking: 1968, 48-50).

14. (Darwin: 1877).

15. (Jacobs: 1885c, 50).

16. (Penniman: 1935, 44-46); (Bolt: 1971, 17); (Haller: 1971, Chap.1); (Erickson: 1974, Chap.3).

17. (Haller: 1971, 5-6).

18. (Beddoe: 1869).

19. For discussions of craniology see (Penniman: 1935), (Bolt: 1971, Chap.1); (Haller: 1971, Chap.1); (Bynum: 1974, Chap.4); (Haddon: 1934, Chap.2); (Hoyme: 1953); (Lorimer: 1978, Chap.7).

20. (Hoyme: 1953, 422).

21. (Erickson: 1974, 114-16); (Haller: 1971, 14-16); (Penniman: 1935, 61, 85-90).

22. (Jacobs 1885c: 38-39, 53-61).

23. See (Forrest: 1974, 138-42), (Pearson: 1914-30 Vol.II, 228-33, 283-303).

24. (Galton: 1883b, 8-9).

25. (Galton: 1877, 97).

26. (Galton: 1883b, 4-5).

27. Ibid, 8. Galton recorded that he discussed his problem with Herbert Spencer who suggested that tracings of the separate photographs be made and, after reduction to the same scale, be superimposed on one another and illuminated by a light source. Spencer had in fact devised an instrument some years earlier for mechanically tracing longitudinal, transverse and horizontal sections of heads on transparent paper, intending to superimpose them to obtain the 'average' result (Galton: 1883b, 340). Elsewhere Galton stated that his method had been suggested as a result of attempts to illustrate multiple geographic features of a country by superimposing images (Galton: 1878).

28. (Galton: 1883b, 10).

29. Ibid, 353.

30. (Jones: 1971).

31. (Galton: 1877, 98). Galton here cited the well known account of the 'Jukes' family which had been published the previous year.

32. (Galton: 1883b, 14-15).

33. Ibid, 18.

34: See (Galton: 1878) for a discussion of criminals; (Galton, Mohamed: 1882) for details of investigations of tubercular patients. Galton also made composites of Royal Engineers which he claimed exhibited vigour, resolution and intelligence. (Galton: 1883b, 14). He exhibited his composites in several places over the next few years. See also (Galton: 1879a) (Galton: 1881a, b).

35. (Galton: 1883b, 18; 1881a; 1885a, b). Galton's method was tried out by the anthropologist Arthur Thompson who attempted to combine Australian and European skull forms (Thompson: 1884). Composite portraiture underwent a vogue in the United States, see (Pearson: 1914-30 Vol.II, 290). The U.S. psychologist Joseph Jastrow made composites of John Hopkins University students, a copy of which can be found in the Galton Collection No. 267/2.

36. (Jacobs: 1885c, 38). The composites are displayed opposite p.53.

37. Ibid, 53-56, on 53.

38. (Pearson: 1914-30, Vol.II, 293-94). In addition to aiding Jacobs Galton published a short note of where and how the composites were taken (inserted at the end of (Jacobs: 1885c)). Jacobs and Galton also published articles on the subject in Photographic News, (Jacobs: 1885b), (Galton: 1885a).

39. (Jacobs: 1885c, 39). In his note at the end of Jacobs' paper, Galton referred to the 'peculiar gaze' of the faces of the people as he passed through the Jewish area of the East End.

40. The title of this section is taken from an editorial in the Jewish Chronicle 15/5/1885. This newspaper will hereafter be abbreviated to J.C.

41. See (Wolf: 1916), (Lipman: 1954).

42. (Jacobs: 1885c, 52-53), my emphasis.

43. (Poliakov: 1974).

44. Ibid, 277-83.

45. See for example the editorials "The 'Judenhetze' in Germany" J.C. 27/2/1880; "The Jews of Germany", J.C. 14/1/1881; the translation of the Vogt article "The Jewish Question in Germany", J.C. 14/1/1881; news reports e.g. 21, 28/1/1881; 4,11/2/1881; 7/1/1881.

46. J.C. 23/1/1880 for a report of the lecture; (Wolf: 1881) for his periodical article.

47. (Wolf: 1881, 338).

48. Ibid, 342, 345.

49. Ibid, 340-42.

50. (Holmes: 1979, 10-13).

51. See J.C. January-February 1880. My assessment is based on both secondary material and a reading of the J.C. 1880-95.

52. Reports began to be published in the J.C. from May 1881.

53. For details see (Lipman: 1954, Chap.5); (Fishman: 1975); (Gartner: 1973); (Garrard: 1971); (Gainer: 1972); (Holmes: 1979, Chap.1-7); (White: 1980). For comparative perspectives see (Holmes: 1978); (Lunn: 1980), both of which contain chapters on Jewish immigration.

54. Immigrants from Eastern Europe had made their way to Britain in the 1870s because of the expulsion of Jews from the Russian border regions in 1869-70 and the Russo-Turkish war of 1875-76 in which anti-Semitism was widespread in the Russian army into which many Jewish reservists had been called up.

55. (Gartner: 1973, 70).

56. (Lipman: 1959).

57. Ibid, Chap.3.

58. (Gartner: 1973, 21).

59. J.C. 12/8/81, editorial "The Work to be Done II: Our Foreign Poor". This was the beginning of a particularly sordid episode in Jewish history in Britain.

60. For example, he wrote that there were

> "Men ruthlessly murdered, tender infants dashed to death, or roasted alive in their own homes, married women the prey of a brutal lust that has caused their death, and young girls violated in the sight of their relatives by soldiers who should have been the guardians of their honour — these have been the deeds with which the population of Southern Russia has been stained since last April."

The articles were republished in the J.C. 13/1/1882, 20/1/1882 and also in pamphlet form by the Russo-Jewish Committee.

61. Ibid.

62. For a report of the meeting see "The Persecution of the Jews in Russia", Times, 2/2/1882. This was almost certainly written by Jacobs. Several people at the meeting referred specifically to Jacobs' articles as bringing the existence of the outrages to a wider audience.

63. "Jacobs, Joseph", Jewish Encyclopaedia; J.C. 16/6/1882, p.10 states that he became Secretary in May 1882.

64. (Jacobs: 1890). The time of publication betrays an obvious polemical interest since it coincided with an intensification of repression in Russia; see (Gartner: 1973, 44) for the background to this bout of repression.

65. (Jacobs: 1885a).

66. (Jacobs: 1891, preface).

67. (Poliakov: 1974, part II).

68. (Wolf: 1880), qu. in J.C. 23/1/1880, see also the article by Vogt reprinted J.C. 14/1/1881.

69. qu. J.C. 15/8/1884.

70. qu. (Poliakov: 1974, 369).

71. Vogt "The Jewish Question in Germany", J.C. 14/1/1881.

72. Editorials were in fact unsigned. My attribution of this editorial to Jacobs lies firstly with the knowledge that he did contribute editorials (Harris: 1968) and secondly, with a comparison of the text with Jacobs signed writings.

73. J.C. 11/2/1880.

74. Ibid.

75. Ibid.

76. (Jacobs: 1891, "Dedication"). For biographical details of Myers see "Myers, Asher I". Jewish Encyclopaedia, (Lipman: 1959, 267).

77. J.C. 18/8/1884.

78. J.C. 27/2/1885, editorial "Jewish Anthropology" and article on Jacobs' paper "Racial Characteristics of Jews".

79. "The Jewish Type", J.C. 7/4/1885, 24/4/1885.

80. "A Comparative Estimate of Jewish Ability", J.C. 18/9/1885; "Jewish Celebrities 1785-1885", J.C. 25/9/1885.

81. "Notes of the Week", J.C. 13/11/1885.

82. "Jewish Statistics", J.C. 4/3/1881. Interestingly this method of attempting to refute anti-Semitic allegations that Jews contribute nothing to the intellectual life of a country was used by the Board of Deputies of British Jews in the 1930s in response to the anti-Semitism which accompanied the growth of Fascism. In a book entitled The Jews of Britain, written by Sidney Solomon, press officer of the Board, half the text was devoted to "Some Jewish Contributions". This sought to list Jewish contributions to literature, art, music, medicine, hygiene, stage, sport, charity. Solomon stated that contrary to anti-Semitic propaganda this evidence demonstrated that Jews were 'good citizens'. (Solomon: 1938).

83. (Jacobs: 1885d).

84. Ibid, 351-52. In Hereditary Genius Galton had actually stated that he would have liked to apply his method to Jews, who appeared to be rich in families possessing 'high intellectual power'. (Galton: 1869, 4).

85. (Jacobs: 1885d, 354).

86. Ibid, 355. Galton followed a similar procedure, discarding 41% of his sample.

87. Ibid, 355-57.

88. Ibid, 357.

89. "Jewish Ability", J.C. 11/2/1881.

90. (Jacobs: 1885d, 357).

91. Ibid, 358-59.

92. Ibid, 359.

93. (Jacobs: 1885d, 361).

94. Ibid, 365; cf. "If Jews...have acquired, by a long process of unnatural selection, any special capabilities, adapting them for any special work in the world, this ought to show itself in actual achievement in recent times." (Jacobs:1916, 45).
Again, it is unclear here what Jacobs' view of heredity was, he appears to adhere to a neo-Lamarckian type of argument.

95. (Garrard: 1971).

96. It should be noted that throughout his investigations in the 1880s Jacobs had the close cooperation, indeed patronage, of Galton. The latter assisted him in obtaining composite photographs of Jews, with investigations on memory, with his biographical and anthropometric work. Galton was probably also responsible for the publication in the Journal of the Anthropological Institute of Jacobs' 1885 papers, when he was President. Galton's Records of Family Faculties were recommended by the J.C. to its readers, it also urged them to help Galton in his work, stating that
"Jewish records of this kind are of especial interest, since the Jewish race, as we have so often urged, affords the best example of heredity."
J.C. 8/2/1884.

97. (Galton: 1874a, 1). For a discussion of Galton's investigations of nature versus nurture see (Forrest: 1974, Chap.10), (Pearson: 1914-30, Vol.II, 126-30, 145-56).

98. (Galton: 1874a, 12).

99. Ibid, 39.

100. (Galton: 1875a, b).

101. (Galton: 1875a, 406).

102. For biographical details see 'Spielman, Isadore', Encyclopaedia Judaica.

103. Their use of the Jewish Working Men's Club was no doubt facilitated by the fact that Spielman was the first cousin of Sir Samuel Montagu, M.P. for Whitechapel and one of the elite of Anglo-Jewry. Montagu was the co-founder of the club, took an active interest in its running and was its President for some years. The other co-founder (and Treasurer) was Asher I. Myers, Jacobs' close friend. See 'Inauguration of Jewish Working Men's Club', J.C. 26/1/1885. 'Myers, Asher I.', Jewish Encyclopaedia.

104. (Jacobs, Spielman: 1889, 76). Jacobs and Spielman also had the assistance of Galton in conducting their investigations. In 1889 Spielman wrote to Galton to tell him that he would be able to let him have the results soon. Galton Collection No. 322/1.

105. (Jacobs, Spielman: 1889, 76-77). The categorization of Jews into "East End" and "West End" reflected the spatial distribution of the Jewish middle and upper class, and the working class, including most immigrants. The former groups, comprising mainly of Jews long settled in London, were concentrated in the city's West End, the latter in the East End. Jews who 'made their fortune' moved from East to West (Lipman: 1959; 5). This situation with respect to Jews was a microcosm of the situation as regards the population as a whole: during the nineteenth century an ever sharper geographical segregation of classes developed in London, see (Jones: 1971, 13-14).

106. 'Immigrant' and 'Jewish Immigrant' were synonymous terms; most of the immigrants were Jews and most of these were Russians. From the earliest days of parliamentary discussion of the question virtually no other group was mentioned — immigrants were by definition Jews, see (Gainer: 1972, 3-4).

107. (Jones: 1971, Chap.16).

108. (Gainer: 1972, Chap.2-3), (Gartner: 1973, Chap.3).

109. For a thorough discussion see (Bennett: 1979).

110. The concentration of immigrants in certain trades is in fact supported by figures of the Board of Guardians, who reported that the proportion in clothing and tailoring trades in 1882 was 25% among applicants for relief and in 1892 35% (Lipman: 1959, 83). Immigrants tended to continue in the trades which they followed in their homeland (Gartner: 1973, Chap.3).

111. See (Gainer: 1972, Chap.3).

112. Ibid, 44-45, 48-52.

113. One of the main sources of this anxiety, at least among the middle class, was an article published in the Lancet entitled 'A Polish Colony of Jewish Tailors' which detailed the living and working conditions of a group of immigrants in the East End and argued that their presence seriously threatened the social and sanitary conditions of that area of the city. J.C. 9/5/1884. This report caused a great sensation (Gartner: 1973, 68), (Gainer: 1972, 79-80). In the wake of this report the Board of Guardians established a Sanitary Commission and throughout 1884 their sanitary inspector kept up a running battle with the Whitechapel District Board of Works, complaining of incompetence and dereliction of duty (White: 1980, 7).

114. qu. (Garrard: 1971, 18).

115. For a detailed discussion of the attitude of the local papers to Jewish immigrants see (Bennett: 1979).

116. qu. (Fishman: 1975, 69).

117. qu. (Garrard: 1971; 25-26).

118. qu. (Bennett: 1979, 138).

119. qu. (Garrard: 1971, 53).

120. Ibid, 28.

121. (Jones: 1980).

122. (Jacobs, Spielman: 1889, 80-81).

123. Ibid, 81.

124. (Venn: 1888), (Galton: 1888b).

125. (Jacobs, Spielman: 1889, 85-86).

CHAPTER 6

MIND AND BODY

Throughout, my effort has been to understand the many important senses in which no man is merely "man thinking". Rather I have tried to show that he is a social being, who belongs to a certain group, inherits a certain tradition, believes in a religion or develops a personal philosophy, and fights for or against certain forms of ideas, not necessarily out of fear or prejudice but because he thus gives meaning and significance to what he lives by and lives for.

A.W. Brown The Metaphysical Society: Victorian Minds in Crisis 1869-1880, p.xii.

One of the most enduring issues in Victorian psychology was the relation of mind to matter. The questions of whether mind and body interact or were autonomous, and the significance of such competing conceptions, were ardently debated and discussed in the periodical press, academic textbooks and in the new professional societies. It is with a consideration of the issue of the relation of mind to matter and the ramifications of particular conceptions of this relation that the following two chapters are concerned. The path followed is to discuss such questions through an exploration of the writings of William McDougall, the most important British psychologist in the pre-First World War period. Throughout, my concern has been to treat issues centred on the relation between mind and body not solely as abstract technical ones, but also having important social resonances and consequences.

Although William McDougall emigrated to the United States in 1920 he must without doubt be regarded as one of the major figures in British psychology in the first decades of this century. As the foremost historian of British psychology noted:

> ...his influence on British psychology and educational thought in the generation prior to the Second World War was immense, and he was unquestionably one of the most striking and forceful figures in the psychology of his day.[1]

No comprehensive study of McDougall and his work exists, although a number of partial and rather unsatisfactory accounts have been published.[2] McDougall's range of interests was immense and included psychology, physiology, psychical research, sociology and eugenics. One of the aims of my analysis will be to argue for the interpenetration of his interests in these areas. In the present chapter I shall argue that the content of McDougall's published work is intimately bound up with his philosophy of nature, in particular his belief in Animism. Secondly, I suggest that these philosophical concerns should not be considered in isolation but in part as the product of the social and cultural context in which McDougall lived.

William McDougall was born in 1871 in Chadderton, near Manchester.[3] His father, a wealthy manufacturing chemist, had him educated privately and in Germany. At the age of fifteen McDougall entered the University of Manchester. Here he remained for four years, taking a general science degree and specializing in geology in his final year. After this he took up a scholarship at Cambridge, an establishment which he regarded as possessing the highest academic and social prestige. At Cambridge he took a medical degree, specializing in physiology, anatomy and anthropology. In 1894 he passed the second part of the Tripos and obtained a scholarship at St. Thomas' Hospital, London. It was while undergoing medical training that McDougall published his first scientific papers — an original theory of muscular contraction and his first paper dealing with psychology.[4] That same year he joined the Cambridge University Anthropological Expedition to the Torres Straits. On his return the following year he took up a fellowship at St. John's College, Cambridge and travelled to Germany to study experimental psychology with G.E. Müller. In 1900 McDougall took up a post at the psychological laboratory at University College, London. In 1904 he moved to Oxford to become Wilde Reader in Mental Philosophy. Despite opposition to his importation of experimental techniques into psychology, he held this post for fifteen years and published widely on such topics as visual sensations, the effects of drugs and fatigue on mental life and eugenics. In 1908 he published his immensely influential Introduction to Social Psychology in which he expounded at length a theory of instinctive behaviour.[5] During 1920 McDougall emigrated to the United States to take up the Chair of Psychology formerly held by Hugo Münsterberg at Harvard University. In 1931 he moved once more, this time to Duke University where he remained until his death in 1939. By all accounts McDougall was an arrogant and dominant personality and throughout his life remained something of an outsider.[6] These traits, together with his championing of unpopular causes, meant

that by his later years he was virtually academically isolated.

Mind and Body

William McDougall's lifelong project was the understanding of the evolution, functioning and behaviour of human beings.[7] The main underpinning of his work lay in his forceful espousal of a form of vitalism. A perusal of the vast corpus of his writings[8] reveals that his thought had at its basis the view that people were not 'mere' machines but possess a soul, the existence of which may be demonstrated scientifically. His philosophy of nature was fundamentally dualist:

> the universe we know seems...to consist of two orders of things, two orders of events; on the one hand the world of matter and motion, on the other hand the world of consciousness, the physical and psychical worlds.[9]

Throughout the course of his career he was concerned to defend a particular form of a doctrine which he termed 'Animism'. This was the view that all or some of the manifestations of life and mind which distinguish the living person from the corpse and from the inorganic world, are due to the operation within the person of a non-material animating principle, conceived of as an immaterial and individual being or soul.[10] In addition to arguing the case for the validity of an Animist philosophy, McDougall also supported an interactionist view of the relation between mind and body. According to the principle of psycho-physical interactionism, psychical and physical processes, or 'soul' and 'body', interact or react on one another, so that psychical processes play a part in determining human conduct.[11]

McDougall's preoccupation with the mind and its relation to the body was not a new departure within physiological psychology; the history of this discipline was closely connected with the history of the mind-body problem.[12] For much of the period since the seventeenth century it seemed debatable whether such a discipline as physiological psychology could exist at all since it was generally held that by its very nature the mind was not amenable to examination by physical experimental methods.

The mind had to be investigated by a method which fitted the subject matter. This method was introspection (self examination) and it lay at the basis of both the dominant 'schools' in British psychology during a large part of the nineteenth century — those of faculty psychology and associationism. By the mid-nineteenth century, however, the rigid dichotomy between mind and matter was no longer widely adhered to. Physiological psychologists argued that the mind could be investigated through the nervous system which they came to regard as the physical analogue or correlate of the mind; the mind was viewed as acting in correspondence with experimentally verifiable nervous actions (the law of psycho-neural parallelism). This solution, while enabling research in physiological psychology to proceed rapidly left open the question of the form of the relation between mind and body. The late nineteenth century saw a long and often exceedingly polemical debate over this issue.[13]

Prominent physiologists, psychologists and spokesmen of the emerging professional scientific community went beyond the basic psycho-neural parallelist position and generally argued for one of four solutions to the mind body problem. These positions can loosely be classified under the headings of epiphenomenalism, psycho-physical parallelism, monism and psycho-physical interactionism. The proponents of epiphenomenalism espoused a reductionist philosophy according to which one would be able to account completely for the conduct of an individual if the nervous system of that person and the physical and chemical processes involved in its operation could be fully described. This was the view put forward by one of the leading spokesmen of late nineteenth century British science, T. H. Huxley. In his well known polemical address to the British Association in Belfast in 1874, Huxley eloquently argued the case for epiphenomenalism. He expounded on the theme that consciousness consisted only of a stream of 'elements of consciousness' which did not in any way influence

one another or react upon the brain processes by which they were produced. Huxley's famous formulation of this position was that

> in men, as in brutes, there is no proof that any state of consciousness is the cause of change in the motion of the matter of the organism...our mental conditions are simply the symbols in the consciousness of the changes which take place automatically in the organism ... We are conscious automata.[14]

On this interpretation mental life is merely an epiphenomenon of determinate brain processes, the human body is an automaton accompanied by a consciousness which has no effect on its actions.

According to the doctrine of psycho-physical parallelism, physical and psychical processes were equally real. Although it was allowed that causal relations existed within both the psychical and physical realms, any causal connection between these realms was explicitly denied by the theory's proponents. The two chains of events were said to simply accompany one another. The hypothesis of parallelism was by far the most popularly adhered to view of the relation between mind and body in late Victorian Britain. It was championed by John Tyndall, the forceful spokesman of the emerging professional scientific community. Tyndall's best known formulation of his position was his Belfast Address, delivered to the British Association on August 19th 1874. At the conclusion of a sweeping panoramic survey of the history of human thought about the natural world from Democritus to Charles Darwin, Tyndall forcefully argued the case for a belief in psycho-physical parallelism, arguing that consciousness and matter were inseparable with a fundamental non-interactive parallelism existing between the two realms.[15] Such a position was also held by the neurologist John Hughlings Jackson and the psychologists George Frederick Stout and William James.[16]

Closely allied to the doctrine of psycho-physical parallelism was that of Monism. Although monism has taken various forms throughout history (for example, the view that everything in nature is 'really'

spiritual), the most common monistic position espoused by late nineteenth century psychologists may be termed the 'two aspect' theory of mind and body. This position appears to have first been formulated by Alexander Bain in his Mind and Body (1868). Here Bain argued that the connection between mind and body was not occasional or partial, but thorough-going and complete. Proof of this was provided by the physical expression of emotion and the concomitant change of physical and psychical states.[17] Bain considered that both mental and bodily attributes were equally intelligible and argued that

> A sentient animal has two endowments, two sides or aspects of its being — the one all matter, the other all mind. Notwithstanding the cardinal opposition of the two sets of powers, they are inseparably joined in the same being.[18]

According to the monistic view, mind and body were two aspects of the one reality and mental facts were at the same time bodily facts. A similar position to Bain's was taken by James Sully in his Outlines of Psychology (1884). This was one of the main psychology textbooks at the close of the nineteenth century. Indeed, by this time Monism had come close to being the official doctrine in British psychology.[19]

McDougall opposed the eiphenomenalists, parallelists and monists by expounding a psycho-physical interactionist view.[20] According to this view, both the physical and mental realms existed, but with a two way causal connection between them and with the laws of causation holding good within each realm. McDougall's main argument against the simple concomitance view of physical and psychical phenomena (parallelism) was that this doctrine could not be reconciled with what he regarded as the generally established 'logical' laws of cause and effect.[21] McDougall's conception of causation broadly followed that first put forward by Hume.[22] He argued that when two processes invariably occurred in conjunction in time, no matter how varied the conditions, then they must be seen to be causally related. Therefore the parallelists, who acknowledged that changes in

nerve states were always accompanied by changes in mental states, were breaking this law of causation. In a similar vein, McDougall argued against epiphenomenalism by asserting that this doctrine of one sided causation contradicted our experience of the world; it offended against the uniformity of nature since all action with which we are acquainted is interaction. Thus, in McDougall's eyes a consideration of causation meant that neural and psychical processes must be related in a reciprocal manner, according to ascertainable laws.[23]

A second argument which McDougall utilized against parallelism was embedded in a wider criticism of association psychology. From its initial formulation in the appendix to the fourth edition of Locke's Essay, the association psychology had been developed and refined in the work of Hartley, Hume, the Mills, Bain, and Spencer.[24] Its proponents sought to demonstrate that all knowledge and experience could be accounted for by combinations of sensations and perceptions, caused in the first instance by external stimuli. The single explanatory principle in their analysis which accounted for all mental processes was the 'association of ideas' — 'complex' ideas are compounded from 'simple' ideas. Towards the end of the nineteenth century, however, this sensationalist psychology became the object of sustained and severe criticism. The main figures in this opposition in Britain were James Ward and G.F. Stout.[25] Their opposition to associationism was based on two main grounds. Firstly, they denied that experience could be analyzed into elements of sensations; secondly, they argued that mental life was a far more active process than had been allowed for by the sensationalist psychology.[26] From the United States too, came extensive and influential criticism of the associationist tradition, in the form of William James' articles in Mind in the 1880s and in his Principles of Psychology (1890).

William McDougall's psychological thought was heavily influenced by these criticisms of associationism and by the conception of an active,

holistic view of mind put forward by Ward, Stout and James.[27] In turn, he too criticized associationism, particularly with reference to its connections with psycho-physical parallelism and epiphenomenalism. Up to, and including, its union with physiology in the work of Bain, Spencer, Hughlings Jackson and David Ferrier, psycho-physical parallelism had been characteristic of the association psychology.[28] McDougall, however, pushed this historical observation further and claimed that

> Every form of parallelism necessarily assumes that the consciousness of any complex organism is in some sense composite, that it is compounded from, or made up of, elements which in principle are capable of existing in separation from the whole of which they form part.[29]

Indeed, he insisted that the upholders of parallelism were logically compelled to subscribe to associationism.[30] McDougall then proceeded to argue against parallelism by employing the holistic criticism of associationism. Contrary to the beliefs of the parallelists

> the Animist, who believes that the soul is something more than the fleeting stream of consciousness, maintains that the consciousness of any individual is or has a unity of a unique kind which has no analogue in the physical realm, and that it cannot properly be regarded as consisting of elements, units, or atoms of consciousness, put together or compounded in any way. He maintains that the unity of individual consciousness is a fundamental and primary fact.[31]

Parallelism was untenable because it was, of necessity, based upon a sensationalistic psychology, and such a psychology not only failed to recognize the unity of consciousness but was also unable to explain knowing, judging, willing, desiring, and reasoning because these processes involved psychical activities which were more than the process of associative reproduction.[32]

Throughout the latter half of the nineteenth century the hypothesis of psycho-physical interactionism came under extensive and sustained criticism. The two main objections put forward against it were based upon the law of the conservation of energy and upon the inconceivability of a two-way interaction between mind and body. Soon after its initial

formulation in the work of Helmholtz, Joule and Mayer, the law of the conservation of energy occupied a central position in the mechanistic world view. Subsequently, many proponents of this philosophy argued against interactionism by reference to this law. It was argued that the transformation of energy involved in every physical process resulted in no change in the total quantity of energy (i.e. energy is conserved). From this it was argued that the sum total of physical processes in the universe resulted in no change in the quantity of its physical energy. Finally, the further deduction was made that the sum total of the energy of the physical universe was a constant quantity. Hence, psychical intervention in the course of physical processes was not possible since it would involve either increasing or decreasing the quantity of energy in the universe and so violate the law of the conservation of energy. Forms of this argument were a recurrent theme in the polemical writings of W.K. Clifford and John Tyndall, in Hughling Jackson's argument in favour of psycho-physical parallelism, and in the major psychology textbooks at the turn of the century — those of Stout and Sully.[33]

McDougall dealt with this objection to interactionism in three ways. Firstly, he argued that the inference that the universe of physical energies was closed and finite was an unsupported supposition. The interactionist could therefore deny that this is so and could assert that there was no definition of physical energy which will exclude the possibility of the inclusion under this term of psychical energy.[34] Secondly, he asserted that the law of the conservation of energy was only an empirical generalization whose validity extended only to those phenomena to which it had been shown to hold by experimentation. Although it could be accepted that the law was a well founded generalization for the inorganic realm, he argued there was no warrant for extending it to the organic realm.[35] Although experiments had been performed by Mayer which appeared to demonstrate that the energy expended by an organism was equal to the energy

taken in, and hence there could be no psychic intervention since this would involve an influx of energy, McDougall took the view that these experiments were both too few and too imprecise. They did not rule out the possibility of such psychic intervention since such intervention could involve undetectably small increments of energy.[36] McDougall's third argument was one which could have more of a popular appeal since it was one which could be accepted by members of the scientific establishment without a violation of existing theories and practices in science. He argued that even if the law of the conservation of energy were true in the way in which the mechanists claimed, then it would still be possible for psychical intervention to take place with no violation of the law. This could be so if the course of physical events were altered by changing the direction of travel of molecules in the brain without altering their speed. He cited the physicists James Clark Maxwell (whom he claimed first suggested it) and Frederick Poynter in support of this argument.[37]

The second main objection to psycho-physical interactionism which was prevalent during the latter half of the nineteenth century centred on the inconceivability of how physical and psychical realms could interact; how things as different as mind and body could be in any way causally connected.[38] This argument had been made as early as 1868 by Tyndall who confessed that

> speaking for myself, it is certain that I have no power of imagining states of consciousness, interposed between the molecules of the brain, and influencing the transference of motion along the molecules. The thought 'eludes all mental presentation', and hence the logic seems of iron strength which claims for the brain an automatic action, uninfluenced by states of consciousness.[39]

This argument underwent considerable elaboration and for one of the fullest statements of it we must turn to Stout's Manual of Psychology. Stout argued that the main objection to the interactionist view

> is that the kind of interaction presupposed is utterly incongruous with our conception of causation on which the whole system of our knowledge both of physical and psychical processes is based. It is the function of science to explain how events take place...but this is only possible in so far as we can discover such a connexion between cause and effect as will enable us to understand how the effect follows from the cause, or, in other words, we must exhibit cause and effect as parts of one and the same continuous process...Now when we come to the direct connexion between a nervous process and a correlated conscious process, we find a complete solution of continuity. The two processes have no common factors. Their connexion lies entirely outside of our total knowledge of physical nature on the one hand, and of conscious processes on the other. The laws which govern the change in position of bodies and their component atoms and molecules in space, evidently have nothing to do with the relation between a material occurrence and a conscious occurrence.[40]

McDougall commenced his criticism of this view by noting that this form of argument implied that the process by which physical interactions takes place could be understood. The communication of motion by impact was, he continued, the kind of causation in the physical world with which we are most familiar. In so far as any instance of causation can be recognized to be of this familiar type we are inclined to feel that we have understood or explained it. Since, however, it is evident by its very nature that psycho-physical interaction cannot be reduced to this familiar type of causation, it is true that it cannot be understood in this sense. McDougall then argued, however, that in no other sense than that of reduction to a familiar type of sequence can we understand physical interaction: we have no direct insight into the process of causation in the physical world; even physical causation cannot be understood in the way in which it is demanded that psycho-physical be understood. Thus, to argue that psycho-physical interaction cannot take place because it is inconceivable how it could occur is absurd.[41]

Although McDougall's belief in what he termed 'Animism' and his concern with the relationship between mind and body were neither peculiar to him or to the period in which he lived, there is one aspect of his

Animism which sets him apart from many others: his view that the soul could be subjected to scientific investigation. McDougall believed that by means of a combination of physiological and psychological inquiries not only could the form of the relationship between body and soul be decided upon, but even more fundamentally, the necessity for postulating the existence of a soul, or at least some form of enduring psychic entity, could be proven. In his Body and Mind he was concerned to emphasize that he had

> endeavoured to indicate a view of the nature of the soul which shall be in harmony with all the facts established by empirical science.[42]

While in the past the problem of the relation of body and soul had been regarded as falling within the province of metaphysical speculation, the issue had now to be decided by the methods of science. McDougall's Animism was fundamentally conceived in opposition to the prevailing mechanistic world view. He argued for a wider conception of the natural world which encompassed the existence of psychical entities. This view was present in his first paper on psychology, where he argued that the "modern" rejection of Animism was based upon the claim by the 'apostles' of the physical sciences that their mechanistic world view must hold sway in all areas of the investigation of nature, and that

> it is only by those who have least freed themselves from our primitive materialism and who have accepted most blindly the mechanical hypothesis of the physicists, that the vastness and mysterious nature of the chasm, as they call it, between consciousness and the motion of molecules is insisted upon.[43]

Thus, McDougall believed in the existence of a 'soul' which influenced, and was influenced by, nervous activity, which could be shown to exist by scientific arguments, and which was the fundamental attribute which distinguished animate from inanimate nature.

The range of arguments which McDougall felt it necessary to deploy in support of mind-body interactionism and in attacking other positions

illustrates the importance and extensive nature of the debate on the relation between mind and matter in late Victorian Britain. It is, however, of crucial importance to recognize that within Victorian biological thought debates over the relation between mind and body were not conducted solely in terms of abstract technical issues. These debates were part of a wider conflict concerning valid ways of viewing the natural world. It is to this conflict and the forces underlying it which we must turn in order to understand what sustained these debates.

Naturalism and its Discontents

William McDougall's philosophy of nature — his Animism and belief in mind body interaction — was not a mere personal idiosyncracy. It was in part the product of the cultural setting of late Victorian Britain. His belief that there was a deeper meaning to human existence than that provided by mechanistic science led him to investigate psychical phenomena and to a belief in the existence of a soul. Through a consideration of his beliefs in this area the wider issues at stake in the debate over mind and body are illuminated.

The latter half of the nineteenth century witnessed the formulation and dissemination of a particular scientific world view, which has been termed "scientific naturalism".[44] Its proponents defined both the nature of truth and the means by which it could be discerned so as to exclude from the sphere of valid knowledge a consideration of any experience or question not amenable to the methods of physical science. According to the cosmology of naturalism the universe was resolvable into one huge mechanism — nature was said to essentially consist of a mass of atoms and energy. The operation of the vast machine of nature was explained by recourse to the law of the conservation of energy. This law set the limits of what was both scientifically and naturally possible: the mechanism of nature was closed to all external interference. The theory of evolution constituted the final element of this naturalistic

cosmology; it provided a means of explaining the diversity in organic forms.[45]

Among the main spokesmen of the naturalistic ethos were T.H.Huxley, W. K. Clifford, and John Tyndall. As I noted earlier, all of these scientists argued forcefully against the view that the mind intervened in the natural world. By holding that the action of non-physical agencies in the physical world was both superfluous and impossible, they argued that life could be interpreted according to the same laws as the inorganic realm; the organic world differed only in respect of its complexity from the inorganic. In formulating these doctrines they explicitly excluded the existence of an immaterial vital force which animated the organism. The epiphenomenalist, parallelist and monist conception of the relation between mind and body which they espoused were themselves part of the naturalist philosophy.

When McDougall took up the arguments which had been presented against mind-body interactionism and Animism and refuted them point by point, he was at the same time attacking the foundations of the naturalist world view. His questioning of the arguments against interactionism based on the law of the conservation of energy was a challenge to one of the pillars of naturalism. The attack which he made on the argument that interaction was impossible because it is inconceivable how the cause and effect could be connected was a challenge to the naturalistic ethos on the grounds of intellectual coherence, since it was itself based on the laws of cause and effect.Viewed in this light McDougall's critique of associationism also forms part of his wider dissatisfaction with the naturalistic philosophy — the association psychology had since the time of Hartley and Hume been wedded with the mechanistic explanation of nature, to form a keystone of naturalism.[46]

When McDougall came to write his first papers on psychology and physiology, the naturalistic philosophy, or at least a form of it, was

still dominant in science. It is in the context of this hostile environment that McDougall's writings should be read. In an unreceptive environment proponents of an unpopular doctrine must not only present their own views in as plausible a light as possible, but must also attempt to throw doubt on opposing beliefs. McDougall's often excessive polemical attacks on naturalism should be viewed as an attempt to construct a coherent 'case' against it; his point by point refutations of the arguments presented against both Animism and interactionism were part of an attempt to bolster the credibility of his own philosophy of nature. His Body and Mind constituted both a sustained attack on mechanism and an extended defence of both Animism and interactionism. When McDougall published this work in 1911, the intellectual environment was in many respects hostile. At the Dundee meeting of the British Association in 1912 the Presidential Address was given by the distinguished physiologist E. A. Schäfer. In this address Schäfer reaffirmed the validity of the mechanist form of explanation in the life sciences. He argued that the problems of life were essentially the problems of matter; the phenomena of life were to be investigated by the same methods used for other aspects of the natural world. The process of biological evolution and the functioning of the human body were both explained by Schäfer in a thoroughly mechanistic manner.[47] At the same meeting of the B.A. McDougall's Body and Mind received extensive discussion. Two papers criticising it and discussing the general question of mechanism versus vitalism were read; these papers were subsequently published in the British Journal of Psychology.[48] The most virulent attack on McDougall's book came from the pen of the biologist Hugh Elliot. In a series of four tempestuous papers Elliot and McDougall presented argument and counter argument about vitalism. In the first paper Elliot acknowledged that McDougall's Body and Mind "presents the most efficient defence of Animism that has ever been published".[49] He did, however, go on to argue that the vitalist case

carried no weight and that the law of the conservation of energy discredited it. Elliot also presented a more positive argument — that McDougall had presented no evidence of the existence of a vital force, only evidence of the inadequacies of mechanism. McDougall replied forcefully and polemically, accusing Elliot of not reading his book carefully. Their disagreements continued unresolved and unresolvable for two further papers.[50]

Naturalism was not simply a scientific world view, it was also a social movement. According to the leading spokesmen of naturalism the truths enshrined in science had consequences which reached far beyond the intellectual realm. The arguments put forward by mid-Victorian apologists of naturalism were part of a wider debate concerning the place of science in society and its relation to traditional religion. Publicists of naturalism sought to relate the practice of science to the physical, economic, and military security of the country. From the 1850s scientists consciously moved towards greater professionalism, involving social and intellectual emancipation from theology and independence from aristocratic patronage. In their polemical writings naturalistic writers called for the replacement of a religiously directed culture by a scientifically oriented one, dominated by men of science. They sought to expand the influence of scientific ideas for the purpose of secularizing society. At the heart of the mid-century 'clash' between science and religion was a conflict over the nature and direction of cultural leadership in a modernized society. It was argued that science should be pursued without consideration either of religious authority or dogma. By claiming their own epistemology as the exclusive foundation for legitimate science and as the correct model for knowledge generally, the advocates of scientific naturalism sought to undermine the intellectual legitimacy of alternative modes of scientific thought and practice, and so to displace the existing clerical and literary elite. A culture based on religion had to be replaced by one based on science.[51]

This naturalistic philosophy was not, of course, embraced by every Victorian intellectual, scientific and otherwise. Many reacted against the mechanistic philosophy, particularly as the power and prestige of its proponents increased. Among the major figures in this 'anti-naturalist' reaction were the Cambridge philosopher Henry Sidgwick, the physicist Oliver Lodge, the physical chemist William Crookes, Alfred Russel Wallace, the psychologist James Ward, and the writer Samuel Butler. These people generally accepted the concepts and theories of science and had at one time or another been trained in science or philosophy, or had been deeply affected by its ideas.[52] They could not, however, accept the view that all valid human experiences and ideals could be expressed through, or subsumed under, existing scientific categories and laws. They refused to abandon fundamental questions concerning religion and metaphysics for what was said to be the certainty of science. The 'reaction' to scientific naturalism must, however, be considered in the context of the Victorian 'crisis of faith', and at a societal rather than an individual level.

One historian of the culture of Victorian Britain has mapped out what he termed the 'anxiety' experienced by the intellectual middle class of the age.[53] Thd mid-Victorian period was one in which Christian intellectuals were beset with spiritual disorder and intellectual strife. One component of this doubt lay in the new conception of both of human beings and nature which had gained currency in the wake of Robert Chamber's Vestiges of the Natural History of Creation (1844), and Darwin's Origin (1859) and Descent of Man (1871).[54] The writings, both public and otherwise, of many Victorian intellectuals reveal an inner conflict centering on the clash of Christian teaching and the implications of Darwinism. This feeling of doubt manifested itself in extraordinarily profound ways. Many passed through a period of deep personal turmoil, sometimes culminating in near suicide.

In psychology the search for a scientifically respectable yet ethically sound philosophy led to a defence of volitional action. For example, Henry Sidgwick stoutly argued that the experience of purpose and value affirmed by the exercise of volition could not be reduced to the physicalist, determinist framework espoused by the exponents of naturalism.[55] Sidgwick passed through a period of doubt in the 1860s following his dissatisfaction with Christian dogma. The effect of his renunciation of orthodox religion manifested itself in more than a process of deep self examination — Sidgwick was led to resign his Trinity College Fellowship because the holding of it presupposed an adherence to the Apostles Creed. With his deep intellectual and moral integrity Sidgwick could not bear to adopt a hypocritical position and in June 1869 he resigned.[56]

Although many Victorians opposed scientific naturalism, the opposition of some, such as Sidgwick and the others mentioned earlier, did not represent a defense of Christianity in the face of the mechanistic interpretation of nature. They relinquished orthodox Christian religious views, although at the same time they could not dispense with the questions and experiences which Christian doctrines had in one way or another interpreted. These anti-naturalists were deeply concerned with human beings and their place in the universe, believing that they possessed unique characteristics such as the capability of acting morally and rationally. They sought to reconcile such beliefs outside the context of Christianity, but within a broadly constituted scientific framework; or at least an intellectual framework which was not wholly incompatible with scientific knowledge. In the wake of the collapse of their orthodox religious faith they sought new frameworks by which to live, a new system of belief and thought which could provide both a guide to conduct and an interpretation of human experience. One area of activity in which many anti-naturalists devoted their energy was psychical research.

The Society for Psychical Research was formed in 1882.[57] The society was an outgrowth of the extensive interest which had been shown in mesmerism and spiritualism from the 1840s. In 1874 Henry Sidgwick, Edward Gurney, F.W.H. Myers, A.J. Balfour and Sidgwick's future wife Eleanor Balfour commenced a systematic investigation of psychical phenomena. Their interest continued throughout the 1870s but by the end of the decade both Myers and Sidgwick were becoming disillusioned. Although Sidgwick, Myers and Gurney were involved in founding the S.P.R. (Sidgwick being its first President) its establishment was primarily the work of the physicist W.F. Barrett and some prominent spiritualists. In the 1870s Barrett had become acquainted with Myers and Gurney and had at this time conceived the idea that if a group of spiritualists were to join forces with a group of scientists to conduct a dispassionate investigation of psychical phenomena, then the question of its nature or validity could be elucidated. To this end he convened the first meeting in January 1882. The stated aim of the society was

> to investigate that large body of debatable phenomena designated by such terms as mesmeric, psychical, and spiritualistic...without prejudice or prepossession of any kind, and in the same spirit of exact and unimpassioned inquiry which has enabled science to solve so many problems, once not less hotly debated.[58]

Within a year of its creation the society had 150 members, by 1890 707 members, and by January 1900 these had grown to 946. The Council of the Society included many prominent people, including Gladstone and eight Fellows of the Royal Society including A.R. Wallace and J.J. Thomson. The membership and Council of the Society was composed of two main groups — a group of unconvinced investigators centred on Cambridge (including Myers, Sidgwick and Gurney), and a group of convinced spiritualists. From the beginning there was confrontation between these two camps which stemmed from the feeling of the spiritualists that Sidgwick and his friends were operating what amounted to a system of censorship, so cautiously did they treat reports of psychical phenomena. The eminent, mainly Cambridge,

scientists who were involved with the society - J.J. Thomson, Lord Rayleigh, Oliver Lodge, C.G.Stokes, William Crookes and their friends Sidgwick, Myers and Gurney were the 'conservative' wing of the society. They dedicated themselves to the careful, and in many respects sceptical, scientific investigation of psychical phenomena. The conflict within the society led to a walkout by the spiritualist fragment in 1886. From then on control rested firmly in the hands of the Cambridge group, with Sidgwick and his wife playing a leading role.[59] The Society set up five working parties to consider thought reading, mesmerism, Reichenbach's phenomena, apparitions and haunted houses, and one to perform a literary or documentary survey. The extensive investigations which were carried out in the 1880s seemed to point to the existence of a distinction between physical (e.g. psychokinesis) and mental (e.g. clairvoyance) mediums. However, virtually none of the physical mediums survived investigation with their reputations intact. It is clear that it was primarily mental mediumship which interested the group centred on Sidgwick.

The interest shown in psychical research by many anti-naturalist intellectuals lay partly in their need to find a consistent and compelling explanation for the meaning of human life once they had relinquished the framework offered by orthodox religion. They believed that psychical occurrences might be able to provide objective empirical evidence of a spiritual aspect of nature and of the existence of a mind or personality dissociated from the body. For example, Henry Sidgwick considered that if psychical phenomena could be shown to be valid this might provide sufficient proof for the survival of the human personality after death. Although Sidgwick and other investigators involved with the Society for Psychical Research did not embrace the tenets of naturalism, they professed what might be termed a 'scientific supernaturalism': supernatural phenomena were to be investigated with the aid of empirical scientific methods and procedures. It was argued that scientists generally refused to investigate

phenomena which might suggest the inadequacy of present scientific theory, or that a psychical realm existed. In a Presidential address to the Society for Psychical Research in 1888 Sidgwick stated:

> Now our own position was this. We believed unreservedly in the methods of modern science, and were prepared to accept submissively her reasoned conclusions, when sustained by the agreement of experts; but we were not prepared to bow with equal docility to the mere prejudices of scientific men. And it appeared to us that there was an important body of evidence — tending prima facie to establish the independence of the soul or spirit — which modern science had simply left to one side with ignorant contempt; and that in so leaving it she had been untrue to her professed method, and had arrived prematurely at her negative conclusions.[60]

It was not science as such which Sidgwick and others reacted against, it was a narrow mechanistic science which refused to even consider the validity of phenomena outside its sphere and which therefore denigrated human experience.

The crisis of faith which was experienced by many mid-Victorian intellectuals continued to manifest itself in the 1880s and beyond. This process of spiritual turmoil and doubt affected the youthful William McDougall, first while attending Manchester University, and later after he had taken up residence at St. John's College, Cambridge. His father was a religious man, and although he was dissatisfied with orthodox Christianity, being successively a member of various Christian sects, he continued to lead his family to Church.[61] When he was sixteen years old, McDougall decided that Christianity had either to be taken seriously or not at all. For a short period he did take it seriously, but like many others, he was led by his reading of Spencer, Darwin, Huxley and Lyell away from the faith towards a detached scepticism.[62] In a similar way to other doubters of the period, such as Sidgwick, he did not become actively hostile to religion; it seemed to him that there must be something in it since it appeared that most people who took life seriously and worked for human improvement, were in one way or another Christians.

It was not until his first year at Cambridge that McDougall finally severed his remaining ties with Christianity. During this year he had accepted compulsory attendance at the College Chapel. At the end of this year, however, McDougall suffered what was to be a terrible blow to him — his mother died due to a painful cancer. This event settled the question of his faith:

> This incident completed the destruction of any remaining orthodox belief in a beneficient Providence. That a gentle woman whose whole life had been the blameless and faithful discharge of her natural duties, involving constant self sacrifice, patient self control, and active effort on behalf of others, that such a woman should die such a death was an unforgivable outrage — if there were any personal and all-powerful Director of our destinies. The moral of it for me was that mankind must rely upon their own efforts to ameliorate their lot; prayer as a petition for help or protection from evil was a childish substitute for personal effort.[63]

In the aftermath of this traumatic incident he ceased attending College Chapel, explaining to the Dean that his conscience would no longer allow him to participate. Although McDougall decisively abandoned orthodox religion he did, like other anti-naturalists, see a need for a replacement for it — human beings still needed some form of moral framework by which to live. He also sided with Sidgwick and others in defending the efficacy of the Will; this formed, as it had for Sidgwick, part of his ethical concerns. He later recorded that

> To reconcile science with morals seems to me a more urgent need than its reconciliation with Religion. I have never yet been able to convince myself that religious belief of any kind is an imperative human need. And I cannot conceal from myself the fact that religious belief has been and is now the ground of much dishonesty, that it becomes increasingly difficult to hold and profess such belief without dishonesty. On the other hand, belief in the efficacy of moral effort and in the reality of moral choice does seem to me an imperative human need. Without it we are discouraged, paralyzed and thrown back individually and socially, into moral chaos. The Mechanistic Science that is still dominant does deny us such belief.[64]

There was a further area in which the interests of McDougall and other anti-naturalists coincided — psychical research.

For much of his life McDougall was intensely interested in psychical phenomena. In 1901 he joined the Society for Psychical Research and from 1903 until he emigrated to the United States served on the Council.[65] In 1920-21 he was appointed President of the Society and in 1921-22 President of the American Society for Psychical Research. While he was at Harvard University he helped to found the Boston Society for Psychical Research and initiated experiments concerning psychical phenomena including telepathy.[66] After his move to the Psychology Department at Duke University McDougall was intimately involved in setting up the programme of experiments on parapsychology which were subsequently made famous through the publications of J.B. Rhine.[67]

In common with other leading members of the Society for Psychical Research McDougall was involved in critical investigations of allegedly psychical phenomena, such as for example, his investigation of the medium Sally Beauchamp.[68] He was also at one with Sidgwick, Lodge and others, in adhering to a scientific supernaturalism. Recall his statement that he had

> endeavoured to indicate a view of the nature of the soul which shall be in harmony with the facts established by empirical science.[69]

In Body and Mind he included a chapter dealing with psychical research, citing the findings of such research in support of Animism, and claiming that

> During the last thirty years the Society of Psychical Research has investigated in a strictly scientific manner certain obscure phenomena.[70]

Furthermore, like the other anti naturalists, discussed earlier, McDougall considered that scientific naturalism unduly restricted knowledge of nature. It excluded the existence of phenomena which it could not explain, phenomena which was evidence of a deeper meaning to human existence than that embodied in naturalism:

> Here, it seemed to me, was a body of ancient beliefs, all of which Science seemed utterly to deny. Yet the ground of such denial was plainly inadequate. It was in the main an inference from the assumption that the universe is a strictly mechanical system. Here were phenomena alleged to occur in all times and places, an allegation supported by a body of strong testimony. And Science frowned upon it all and said: "Such things cannot happen". ...I saw in the Society for Psychical Research a body of earnest seekers after truth, conscientiously using methods which might reveal truth; and these researches were largely in the field of psychology...it seemed to me a scandal that psychologists should refuse to lend a hand or at least moral support for this heroic effort.[71]

One of the main sources of McDougall's interest in psychical research lay in the possibility that it would provide proof of some form of immortality. I noted earlier Sidgwick and others in the Society for Psychical Research tended to concentrate on 'mental' rather than 'physical' manifestations of psychical phenomena. This was in part because of their deep desire to find proof of immortality. McDougall was also sceptical of 'physical' phenomena and more inclined to believe in existence of 'mental', particularly telepathic, phenomena.[72] He also sought evidence of immortality in the findings of psychical research:

> I should welcome the establishment of some sure empirical foundations for the belief that human personality is not wholly destroyed by death...I judge that this belief can only be kept alive if a proof of it, or at least a presumption in favour of it, can be furnished by the methods of empirical science.[73]

It was towards an attempt to provide this empirical foundation that McDougall devoted considerable intellectual energy. He later recorded that if it had not been for the necessity of earning a living he would perhaps have devoted himself to the investigation of psychical phenomena full time.[74] However, throughout his career McDougall held an uncomfortable position regarding psychical research: philosophically and morally he was predisposed to accept its findings; yet his professional training led him to adopt a sceptical and critical attitude towards any claim about the validity of psychical phenomena. This attitude resulted in his clashing with other psychical researchers on several occasions.

Mind, Body and Morality

In addition to the 'crisis of faith' there was another source which sustained anti-naturalist thought in late Victorian Britain. This was the role which a belief in an immortal soul could play in ordering human conduct. For many professional academics and intellectuals the issues raised by religion, philosophy and science posed problems on which grave practical issues depended.

The decline of Christianity and the prospect of a growing support for atheism which appeared to stem from seemingly materialist developments in science were a source of alarm and had deep social reverberations.[75] It was assumed that any collapse of faith would destroy all sanctions of morality, and once morality had gone society would disintegrate. What intensified these general speculations on the causal relationship between unbelief and disorder was their particular application to the working class: it was thought that the discarding of the Christian sanctions of duty, obedience and patience would lead to a threat to property and the state.[76] Such a fear was articulated by Henry Sidgwick who in common with most Victorian believers felt that if religion vanished overnight, human morality would pass away and the breakdown of existing society would result.[77] He was reluctant to publish his sceptical views about the possibility of human immortality because the loss of such a hope "from the minds of human beings as now constituted, would be an evil of which I cannot pretend to measure the extent," if not the actual "dissolution of the existing social order" at least the increased danger of such a catastrophe would result.[78] In Sidgwick's view it had to be assumed, in order to avoid moral chaos, that the universe constituted a moral order with a God and that human personality survived bodily death. Without the presence of a deity he considered that the question "What ought I to do?" could receive no logical or rational answer. Since orthodox Christianity was unacceptable to him Sidgwick felt the need for

an alternative moral system to provide a framework for human conduct. In pursuit of this alternative he involved himself in psychical research, seeking to demonstrate that there was an intelligible and coherent Cosmos from which ethical principles could be deduced. By acting on the assumptions that a God existed and that immortality was a reality, each person could follow their social duty and sacrifice immediate happiness with the assurance that in the long run personal sacrifice would be compensated with future pleasure.[79]

Sidgwick's belief in the social necessity of a belief in a deity and immortality formed part of his wider social and political views. For Sidgwick ethical philosophy was related to the progress of industrialism, educational reform and social upheaval; personal, moral and social problems were indistinguishable.[80] It was a recognition that the individual and society were interdependent that led Sidgwick to abandon the economic principle of Utility in its extreme form. He argued that the egoism which was promoted by the Utilitarian premise of a society of self-maximizing individuals was fundamentally destructive. The 'order' of society arose not only from the operation of the market and the rule of law, it also stemmed from the interaction of individual conscience and social consensus.[81] The quest for immortality which manifested itself in psychical research was the result of a search for a basis upon which people could be persuaded to perform their 'proper' social duties.

In a period of major social and political disturbance, Sidgwick and other intellectuals believed that unity and leadership were of fundamental importance.[82] Acting in the belief that Britain was in the throes of witnessing a dissolution of the existing social order, F.D. Maurice, Professor of Moral Philosophy at the University of Cambridge, and a friend of Sidgwick's, argued that religion provided a basis for national unity and guidelines for behaviour.[83] J.R. Seeley, Professor of

Latin at University College, London and later Professor of Modern History at Cambridge, argued that the church occupied a special place in society. He conceived of a 'clerisy' whose special responsibility would be to promote national unity and therefore prevent class antagonism and keep at bay the spectre of revolution. Since they were drawn from all classes the clergy were, he claimed, the natural mediators between class and class. In the absence of religion society possessed no stability or unifying principles and decay, enfeeblement and immorality resulted. Religion would, he held, lead to the recognition of higher principles outside the individual self.[84]

The views of these and other professional academics concerning the social need for a religious basis for society formed part of their more general political programmes. They were members of the new and growing professional class and, as members of the Liberal intelligentsia, argued for the establishment of a programme of class collaboration in order to end poverty and other social problems, and to heal social divisions. They believed that neither the aristocracy nor the industrial bourgeoisie could effectively govern the country. If social change continued unaccompanied by political adjustment national institutions would decay and government would become a plutocracy, with the working class owing neither it nor the nation any loyalty. The influence of the aristocracy in government was, they held, detrimental to the wellbeing of the country because they only represented a section of the population. The aim of an efficient, stable nation could only be achieved when the working class participated in some way in the running of government and industry.[85] In furtherance of this end some academics, for example Sidgwick and Maurice, supported Christian Socialist schemes and policies.[86] They argued that as a way out of the difficulties in which the country found itself, the working class had to be educated in the habits of

prudence, forethought and cooperation. Schemes of cooperative distribution and production appealed to them because it was thought that involvement of the worker in the management of industry would educate him or her in the 'laws of social progress'.[87] It was as part of this programme of incorporation and stabilization that the intellectuals emphasized the importance to society of individual conviction and responsibility. They sought to project these values into society in order to promote the 'moral health' of the country.[88]

The 1880s, 1890s and the years beyond saw the dissolution of the mid-Victorian system. During this period the British economy declined relative to those of the U.S.A. and Germany. Britain responded to the years of the so-called 'Great Depression' of 1873-96 not by modernizing the economy but by retreating into a world of formal and informal colonial possessions; instead of meeting competition face to face, exports to satellite economies increased and hitherto commercially unexploited areas of the world were opened up for British trade.[89] The changes in British society at this time were, however, by no means the simple product of economic developments. They were just as much to do with political and ideological relations both between and within classes, and between classes on the one hand and intellectual groups and parties on the other. In addition to the developments in the fortunes of British capital, the other main development during this period was the transformation and growth of working class industrial and political organization.[90] The 1880s saw the rise of organized socialist groups; both the Social Democratic Federation, founded by H. M. Hyndman, and the Fabian Society, patronized by intellectuals such as H. G. Wells and Sidney Webb, came into being at this time. It was also during this period that the 'New Unionism' grew; demands were made in many industries for a basic eight hour day, there were major and very bitter strikes among dock and gas workers in 1889-90; union membership increased dramatically, primarily

among the unskilled.[91] Furthermore, the extensive social surveys conducted in this period had revealed that the casual labourers and inhabitants of the slums of the large cities lived in a state of squalor and almost chronic starvation. Although they were hardly revolutionary, this 'residuum' (as it was termed), were seen as being politically volatile and a threat to property and power.[92] The growing threat of working class militancy, and the existence of extreme poverty, instilled a climate of uneasiness in upper class minds. In the political sphere there was a struggle over who was going to represent dominant or propertied interests. Political confusion had resulted after the disintegration of the Liberal party in the wake of Gladstone's unsuccessful efforts to solve the 'Irish problem'. At the same time Toryism was reconstituted on a new social and ideological foundation: it was no longer the bulwark of the landed gentry and the Church, but increasingly the party of Empire and Nationalism.

The changing social, economic and political conditions towards the end of the century were accompanied by changes at an ideological level. Debates were engendered about the nature and course of society, and in particular about the proper role of the State — whether it should play an interventionist or backstage role. Another debate concerned whether the situation in which Britain found itself was in some way linked to some sort of moral crisis; whether there was a lack of a sense of 'community' in the population at large; whether social change had not been accompanied by a corresponding 'moral' development. While McDougall's Animistic thought was in part the product of a rejection of orthodox religion and scientific naturalism and his felt need for a spiritual reality, another source lay in the wider social significance of a belief in a non-material aspect of nature. Characteristically McDougall displayed no reticence in making his beliefs heard. In his polemical Body and Mind (1911) he argued that a belief in the existence of the soul and its survival after bodily

death was of immense social and political significance:

> that we ought to desire a proof of the survival of our personality after death is, I think, demonstrable from moral considerations. In the first place the great injustices of human life as we know it remain a dark shadow that cannot be relieved if each man's personality ceases with the grave, a shadow must darken our whole conception of the universe and man's position in it. Secondly...the desire for evidence of a continuance of personality after death is justified by the influence such evidence might be expected to have upon conduct. There can be no doubt...that, where a belief in a future life obtains generally among any people, it tends to maintain and to raise the standards of thought and conduct of that people. In all ages the national existence of every highly civilized people is seriously threatened by the tendency for each individual to live for himself alone and to secure for himself as much enjoyment as possible, regardless of other considerations. An effective belief in a future life seems to be the only influence capable in the long run of keeping this tendency in check...there can be no doubt that under the influence of science this belief is rapidly decaying.[93]

Without a widespread belief in Animism civilization was doomed:

> Animism...permits us to hope and even to believe that the world is better than it seems; that the bitter injustices men suffer are not utterly irreparable, that their moral efforts are not wholly futile; that the life of the human race may have a wider significance than we can demonstrate.[94]

The marked difference in tone between McDougall's forthright statement and Sidgwick's earlier quoted view that the loss of a belief in an afterlife could result in the "dissolution of the existing social order" indicates more than just a difference in personality between the two men, it is symptomatic of the changed social and political context between the 1880s and the turn of the century.[95]

The feeling that Britain's national status and international role was under threat stimulated many intellectuals to consider the question of whether there was a need for a reassertion of a belief in religion or a spiritual reality. McDougall's beliefs formed part of this wider pattern. In some respects McDougall's thought is similar to a group of physicists associated with the Cavendish Laboratory at Cambridge, including Joseph Larmor, Lord Rayleigh, J.J. Thomson, C.G. Stokes and Oliver Lodge.[96]

This group argued in similar terms to McDougall against a mechanistic conception of the universe. Further, several of them became leading figures within the Society for Psychical Research. One of the most important aspects of the thought of this group was their conception of the ether. Matter, electricity and all other physical phenomena were to be made intelligible by viewing them as properties of a suprasensible ether. The ether was given a transcendent, unifying role within science: it was the simplicity underlying disorder; it established continuity and connection between events. Brian Wynne has argued that this group of physicists possessed a holistic style of thought which can not only be discerned in their conception of the ether but also in their firm belief in the need for an organically unified society. By cultivating and propagating an organically unified intellectual universe, Wynne argues that this group believed they could engender an organically unified moral and social order.[97] Further, these views were the product of their social experiences and concerns.

Such beliefs about the need to provide social cohesion were voiced by others. In his book Social Evolution (1894) Benjamin Kidd argued that the social sciences had their foundations in the biological sciences. From this premise he claimed that human beings had evolved by a process of selection based upon competition. In the changed economic climate at the turn of the century, however, the struggle within nations was being replaced by the struggle between nations. The best chance of success in this struggle would, he argued, be given by the achievement of internal social solidarity. Such solidarity could not be achieved by rational persuasion; only some supra-rational belief such as religion was adequate to the task. What had to be encouraged in the modern state was a sense of devotion to duty.[98] Fifteen years after the publication of Kidd's book there appeared a book entitled The Condition of England (1909) by C.F.G. Masterman. Masterman was both a writer on social

questions and an active politician — a liberal M.P. from 1906 to the War. The book fell into two parts: an analysis of the various classes in England and a diagnosis of the social maladies besetting the country. In three chapters dealing with Science, religion and literature he dealt with what he thought were the possible sources of faith in modern society and found them all lacking. At the heart of social problems Masterman saw spiritual decay; again and again he returned to the loss of faith and the need for a religious revival. A resurgence of spirituality would, he thought, lead people to act less egoistically, and so lead to a stable society.[99]

It was not, however, simply their concern with the lack of moral values which McDougall shared with Kidd, Masterman and others. He also shared their concern about the efficiency of the nation and its ability to compete in what he saw as the international struggle. In McDougall's thought this concern manifested itself, as it did for many others, in his support of eugenic policies and argument that a 'rationally' planned society was needed. In the wake of the social surveys conducted towards the end of the century and the deprivation revealed during recruiting for the Boer War, a concern arose that the physical and mental efficiency of the nation was declining. This perceived problem of degeneracy was seen by many as being interconnected with the problem of the declining birthrate of the middle class — it seemed that the country was on the way to becoming a nation of degenerates. It was in this context that eugenics became a prominent, and widely adhered to, set of beliefs. The eugenicists had a biological explanation for the existence of the residuum: natural selection had been superseded by charity, medicine, and sanitary reform. It had therefore to be replaced by conscious eugenic policies. In a broader context it was argued by many that for the successful implementation of these policies the nation had to be organized on a rational basis, under the guidance of people who were professionally

qualified. In 1907 the Eugenics Education Society was formed to publicize eugenic ideas.[100]

One example of the type of view which became common can be found in the writings of C.F.G. Masterman. Although he was far from being an upholder of an extreme eugenicist position, Masterman did engage in rhetoric about the implications of the declining birth rate of the middle class. In his Condition of England he regretfully concluded that

> The nation must inevitably suffer from an artificial restriction of children amongst those very classes and families who should be most encouraged to produce them; who offer the best chances of raising, from a healthy stock and in simple homes, the men and women who will be the most desirable citizens of the future. And a nation is in a serious condition if its better stocks are producing smaller or no families at all, and its least capable are still raising an abundant progeny.[101]

Masterman's views are in this respect quite unexceptional. A concern with the differential birthrate between the 'fit' and 'unfit' was widespread. One can, however, discern in his writings that his eugenicist beliefs and his view that there was a need for a spiritual core to human society, noted above, come together. He felt that the latter was necessary for an ordered society while the existence of the differential birthrate was symptomatic of a breaking down of the existing order. There was seen to be a close link between biological degeneration and moral disintegration.

William McDougall was an extremely ardent eugenicist. His first published article on the subject was a paper read to the Sociological Society in 1906. Here he argued that since the non-inheritance of acquired characteristics was well established (a view he soon changed) then

> we are not justified in relying upon education and improvement of the conditions of life for the improvement of the innate constitution of the population of this or any other country, or even for the prevention of its deterioration.[102]

McDougall argued that 'negative eugenic' measures (e.g. sterilization of

the 'unfit') were difficult to apply without injustice. Further, even if such a policy were implemented it would not succeed in its final aim unless the 'fitter' increased their birthrate. A policy of 'positive eugenics' — stimulating the birthrate of the latter — seemed to him to be the only way to stave off the deterioration which threatened. To achieve this end McDougall advocated the implementation of a progressive family allowance policy, whereby the 'better stock' would in effect be paid for having more children.[103] Eight years later he felt strongly enough about the value of eugenical policies to contribute an article to the Eugenics Review — the mouthpiece of the Eugenics Education Society.[104] Here he argued, in common with others, that eugenics was an applied science and that its foundations rested upon biology and psychology. In particular, McDougall suggested that mental testing could be harnessed to the service of the eugenical cause.[105]

McDougall's opinions regarding eugenics became more outspoken in the ensuing years. By 1921 he could write that if the United States adopted a policy of positive eugenics then

> the American people may face the future with a well grounded hope that they are building the greatest Nation and the most glorious civilization that the world has ever seen, a nation capable of assuming the leadership of the world, and of ensuring the reign of justice, freedom and kindness throughout every land.[106]

Like many other eugenicists McDougall not only advocated policies which entailed restricting or encouraging the birthrate of different classes of society, he also called for a society organized in an efficient, rational manner by professionally qualified people. In his Psychology: the Study of Behaviour (1912), which was aimed at a popular audience, he wrote that

> All collective deliberation and decision, whether of a committee, a parliament, or a whole nation, can only be saved from the imbecilities of the unorganized crowd by the existence of such an organization as gives predominant influence and responsibility to those members best qualified for arriving at just conclusions.[107]

It is clear that McDougall was a very politically aware man who did not shrink from suggesting that his profession serve what he saw as the betterment of society. Neither his support for eugenic policies, his wish for a 'rationally' planned society, nor his view that a belief in a non-material soul could serve as a bulwark against subversive tendencies in society, were peculiar to him. All united in a coherent political philosophy to stave off what he feared could be the collapse of an ordered society. Soon after his emigration to the United States he wrote:

> I have two hobbies — Psychical Research and Eugenics... these are the lines of approach to the most vital issue which confronts our civilization — two lines whose convergence may in the end prevent the utter collapse which now threatens.[108]

Body and Mind

In late Victorian Britain the issue of the relation between mind and body was one which engendered sustained and forceful debate. Philosophers, psychologists and other intellectuals supported a range of positions on this question. These positions and the earnest debates which resulted were not, however, solely determined by abstract technical issues. The relation between mind and body had a wider social significance. This both determined which position was taken up by the respective parties and led to the rhetorical employment of particular conceptions of the relation of mind to body. On the one hand, the supporters of scientific naturalism were concerned to expound a philosophy which excluded spiritual entities from the material world; accordingly, they argued forcefully against the view that mind and body could interact. On the other hand, those who viewed the universe as possessing a spiritual aspect as part of its essential nature were concerned to argue in favour of a full and consistent relation between mind and body.

A rejection of scientific naturalism and the seemingly spiritually

barren universe which followed from it, lay at the heart of William McDougall's philosophy of nature. His adherence to mind-body interactionism and his forceful attacks on other positions illustrate the range of positions taken on this issue. Further, his philosophy of nature was not the result of some abstract 'choice', it formed part of a wider concern in Victorian society that there was a need for a spiritual core to human existence. It was also determined by McDougall's social and political concerns and in particular by his view that for an orderly society a belief in the world of spirit was essential.

In the following chapter I shall argue that McDougall's philosophy of nature was at the core of his published work in evolution, physiological psychology and behavioural psychology. It was through the intermediacy of this philosophy of nature that his scientific work was structured by its social context. Thus I shall argue that McDougall's values profoundly influenced his scientific theories and that it is therefore not possible to draw distinctions between his 'scientific' and 'extra-scientific' work.

Chapter Six

Notes

1. (Hearnshaw: 1964, 158).
2. See (Heidbreder: 1973), (Hearnshaw: 1964: 185-95), (Fletcher: 1968, 47-57), (Pastore: 1949), (Soffer: 1978), (Jones: 1980, Chap.7).
3. For biographical information see (McDougall: 1930), (Greenwood, Smith: 1939), (Burt: 1939, 1955).
4. (McDougall: 1898a, b).
5. The popularity of this work can be gauged by noting that it ran through twenty one editions in twenty two years in addition to being reprinted several times.
6. See (Boyle: 1978, 377-80) for illuminating comments by a near contemporary of McDougall, T.H. Pear.
7. The justification for terming McDougall's work a project lies not only in a retrospective assessment of his work but also in a reading of his autobiography where he explicitly refers to having embarked consciously on such a project, see (McDougall: 1930).
8. McDougall wrote forty three books and one hundred and eighty nine articles. For a full bibliography see (Robinson: 1943).
9. (McDougall: 1906, 112-13).
10. (McDougall: 1911, VIII). McDougall's use of the term 'Animism' derives from the work of the anthropologist E.B. Tylor, who used it in his Primitive Culture (1871). For an excellent account of Tylor's 'Animism' see (Stocking: 1968b).
11. (McDougall: 1905, 8).
12. (Smith: 1973, 78).
13. (Smith: 1970, 46; 1977). For contemporary discussions of the relation of mind to body see the articles on 'Epiphenomenalism', 'Monism' and 'Parallelism' in (Baldwin (ed.): 1902). For an account of how this debate was grounded in moral and political allegiances see (Daston: 1978), (Jacyna: 1981).
14. Huxley: (1874) 1893, 266).
15. (Tyndall: 1879, 190-97). For further statements by Tyndall on his view of the mind-body relationship see his essays on 'Vitality', 'Scientific Materialism' and 'Apology for the Belfast Address',in (Tyndall: 1879). It is important to note that although Tyndall joined with Huxley in arguing for a materialist conception of nature, he could not accept the latter's epiphenomenalism, Ibid, 224.
16. (Engelhardt: 1975), (Greenblatt: 1977, 424-30), (Stout: 1898, 34-55), (James: 1890, esp. Chap.V,VI).
17. (Bain: 1878, 6-8).
18. Ibid, 126.
19. (Ward: 1886, 600), this work provides a useful survey of positions taken on the mind-body relationship towards the turn of the century; (Sully: 1894, 470-74). Stout also came close to arguing for a monistic position on several occasions. The philosophy of the mathematician W.K.Clifford should also perhaps be labelled monistic, he held that mind and matter were of the same 'stuff' differently compounded (Clifford: 1874, 555-80).

20. McDougall was not alone in adhering to this view, other exponents had included Sir Henry Holland and W.B. Carpenter (Smith: 1970, 127; 1977, 220).

21. (McDougall: 1898, 6, 26).

22. See (Hume: (1739) 1888; Book 1, 69-176). Hume's view of causation became one of the central tenets in British empiricist philosophy.

23. (McDougall: 1905, 10-11). McDougall's objection to epiphenomenatism had earlier been voiced by Stout, see (Stout: 1898, 49). It is clear that his opposition to epiphenomenatism and parallelism was present at the beginning of his career; part of his first published psychological paper consists of a forceful attack on these doctrines (McDougall: 1898b, 24-33).

24. For the history of association psychology see (Warren: 1921), (Boring: 1950), (Young: 1970, 1973a), (Croom Robertson: 1886), (Rapaport: (1938) 1974).

25. The most influential early attack was Ward's article 'Psychology' in the ninth edition of the Encyclopaedia Brittanica. Stout was a pupil of Ward's at Cambridge.

26. (Ward: 1886; repr. with additions 1918), (Stout: 1896; 1898). For an excellent discussion see (Hamlyn: 1968).

27. McDougall attended Ward's lectures at Cambridge in 1898-99 and later wrote that he regarded his work as

> an endeavour to carry to its logical conclusion that critical rejection of the mosaic psychology which had been the main theme of the psychological writing of James Ward.

(McDougall: 1923, X). For Ward's views on the relation between mind and body see (Ward: 1927, 182-208), (Murray: 1937). McDougall also recalled that "James and Stout are the only two men of whom I have felt myself to be in some degree the disciple and humble pupil. (McDougall: 1930, 203).

The view of some observers that McDougall "began his march into psychology out of step with the rhythm and nature of the field" is quite misplaced, see (Krantz, Hall, Allen: 1969, 27-28).

28. (Young: 1970, 96).

29. (McDougall: 1911, 281).

30. Ibid, 282.

31. Ibid, 282-83.

32. Ibid, 284.

33. (Clifford: (1874) 1879, 53-57); (Tyndall: 1879, 182-83), (Stout: 1898, 47-48), (Sully: 1894, 472); Engelhardt: 1975, 144). For contemporary discussions see (Nunn: 1911), (Ward: 1910, 602).

34. (McDougall: 1905, 8-9; 1911, 211-21). McDougall also speculated that the mind itself may be a form of energy which must be considered to have a heat equivalent which could be determined at a future date (McDougall: 1898b, 386).

35. (McDougall: 1911, 220).

36. (McDougall: 1905, 8-9; 1911, 220).

37. (McDougall: 1911, 228). For contemporary discussions see (Chase: 1899), (Nunn: 1911, 47-50). McDougall presented variations on the 'guidance without work done' hypothesis. One was based upon Driesch's argument that the conversion of 'potential' energy of organisms into 'active' energy could be temporarily suspended by psychic intervention (or, in Driesch's terms, by the 'entelechy' of the organism), (McDougall: 1911, 214).

38. This objection was put forward by W.K. Clifford, John Tyndall, and G.F. Stout; see (Clifford: (1874) 1879), (Tyndall: 1879, 86-87, 224), (Stout: 1898, 46-48).

39. (Tyndall: 1879, 224).

40. (Stout: 1898, 47-48).

41. (McDougall: 1905, 9-11; 1911, 122-23, 206-11). It is Stout's formulation of the 'inconceivability argument' which is the immediate object of McDougall's criticism, part of the above passage from Stout is quoted by McDougall, (McDougall: 1911, 123).

42. (McDougall: 1911, XI).

43. (McDougall: 1898b, 383).

44. See (Turner: 1974a), (Durant: 1977, Chap.1), (Jacyna: 1980).

45. (Turner: 1974a, 24-30); see (Ward: 1899) for a thorough contemporary discussion and critique of scientific naturalism.

46. (Turner: 1974a, 15).

47. (Schäfer: 1912).

48. (Latta: 1912), (Watt: 1912).

49. (Elliot: 1912, 314).

50. (McDougall: 1913a), (Elliot: 1913), (McDougall: 1913b). Elliot was a prolific opponent of vitalism; some years previously he published an attack on Henri Bergson's philosophy entitled Modern Science and the Illusions of Professor Bergson (1908).

51. (Turner: 1974a, Chap.2; 1974b; 1978). The best source for the views of the publicists of naturalism are their own essays, see (Clifford: 1879), (Tyndall: 1879), (Huxley: 1893-94).

52. (Turner: 1974a, Chap.1).

53. (Houghton: 1957, Chap.3).

54. (Moore: 1979, 102-10); on the religious reception of Darwinism see (Annan: 1959), (Willey: 1959).

55. (Daston: 1978).

56. (Turner: 1974a, 39). Leslie Stephen also paid a material price for his 'crisis of faith'. He was ordained a priest, but after passing through a period of intense doubt eventually renounced holy orders and consequently lost his Tutorship and Fellowship at Trinity Hall, (Moore: 1979, 104).

57. Sources for the history of the Society for Psychical Research are (Gauld: 1968), (Hynes: 1968, 132-49), (Turner: 1974a, 50-60), (Palfreman: 1979, 210-29), (Root: 1978; 1980). A useful outline of the society's activities can be gleaned from Presidential Addresses to the Society for Psychical Research (1912).

58. Proceedings S.P.R. Vol.1 (1882), 3.

59. The society's Proceedings exhibits the degree of control which this hierarchy possessed over the society's activities. On Sidgwick's involvement see (Broad: 1953, 86-115).

60. (Sidgwick: (1888) 1912, 35).

61. (McDougall: 1930, 191).

62. Ibid, 194.

63. Ibid, 196-97.

64. Ibid, 218.

65. This information was obtained from membership lists of the Society which were printed every year in the Proceedings. The earliest evidence of McDougall's interest in psychical phenomena is a letter written to a spiritualist magazine The Two Worlds on July 28, 1899, in which he warned readers to avoid a fraudulent medium. McDougall had certainly begun active investigation by the time of his move to Oxford in 1904. Cyril Burt, who studied with McDougall there, recalled that himself, McDougall and J.C. Flugel used to carry out experiments in telepathy shortly after McDougall's arrival in Oxford (Mauskopf, McVaugh: 1980, 325). Another of McDougall's contemporaries on the staff at Oxford was the philosopher F.C.S. Schiller. He became one of the most active academics in the Society for Psychical Research in the 1920s. It is unclear, however, if he and McDougall worked together at Oxford. On Schiller see (Abel: 1955, 140-44).

66. He was elected President of the A.S.P.R. in May 1921. McDougall's plans for the future of the Society included an active programme of research and the establishment of ties with orthodox science. Indeed, he succeeded in setting up an Advisory Scientific Council and persuaded six leading U.S. psychologists to sit on the A.S.P.R.'s Council. In 1923, however, McDougall was deposed from his Presidency by a rival faction of the Society which did not agree with the investigative policy followed by him. The Boston Society was organized as a rival to the A.S.P.R. For a full account of McDougall's involvement in psychical research in the U.S. see (Mauskopf, McVaugh: 1980), see also (Rhine: (1937) 1950, 36).

67. (Mauskopf, McVaugh: 1980, Chap.6); see also (Rhine: (1937) 1950,31). Rhine was a student of McDougall's.

68. (McDougall: 1907c).

69. (McDougall: 1911, xi).

70. Ibid, 347 (my emphasis).

71. Ibid, 219.

72. Ibid, 219-20.

73. Ibid, xiii.

74. (McDougall: 1930, 220).

75. (Houghton: 1957, 54-58).

76. Ibid, Chap.3,10. for an excellent discussion of the fear of atheism.

77. (Turner: 1974a, 45).

78. (Sidgwick: 1906, 357). F.W.H. Myers also believed that the victory of materialism could have disasterous social effects and that psychical research could help in the struggle (Gauld: 1968, 141). For discussions of Sidgwick's beliefs see (Soffer: 1978, 122-25), (Schneewind: 1978). The memoir by his wife and brother remains the best source for details of his life and work.

79. (Turner: 1974a, 46-47).

80. (Rothblatt: 1968, 136).

81. (Dewey: 1974). Although Sidgwick briefly toyed with Utilitarianism his enthusiasm soon waned (Rothblatt: 1968, 137).

82. (Rothblatt: 1968, 145).

83. Ibid, 144.

84. Ibid, 161-3 (Jacyna: 1980, 21-22), (Lynd: (1945) 1968, Chap. 8).

85. (Harvie: 1976, 160, 165), (Roach: 1957).

86. For example, Sidgwick was involved in organizing a Christian Socialist Working Men's College in Cambridge, (Harvie: 1976, 36).

87. Ibid, 36, 164, (Rothblatt: 1968, 144), (Yeo: 1973, 274-75).

88. (Harvie: 1976, 48, 55). The view that a belief in a spiritual reality possessed a social utility was, however, embraced by others of a different political persuasion, for example Alfred Russel Wallace wrote in 1866:

> I prefer...to rest the claims of spiritualism on its moral uses. I would point to the thousands it has convinced of the reality of another world, to the many it has led to devote their lives to works of philanthropy, to the eloquence and poetry it has given us, and to the grand doctrine of an ever progressive future state which it teaches us.

quoted (Durant: 1979, 48).

89. (Hobsbawn: 1968, Chap.7).

90. (Lynd: (1945) 1968).

91. (Lichtheim: 1975, 194-217), (Lynd: (1945) 1968, Chap. 7, 379-95).

92. (Jones: 1971).

93. (McDougall: 1911, 203-04).

94. Ibid, 357,

95. McDougall explicitly refers to Sidgwick's view that a belief in immortality is socially desirable, ibid, 203.

96. See (Wynne: 1977, 1979), on which the following discussion is based.

97. (Wynne: 1977, 58).

98. (Kidd: 1894), see also (Mackintosh: 1899, 238-55), (Semmel: 1960, 31-35), (Jones: 1980, 121-22), (Collini: 1979, 176-77). Kidd's work was a source book for much of the writing in the 1890s and 1900s on biological theories of society. McDougall made great use of it in his Introduction to Social Psychology (1908).

99. (Masterman, 1909), see also (Hynes: 1968, 54-69).

100. On the history of the British eugenics movement see (Farrall: 1970; 1979), (Mackenzie: 1976), (Searle: 1976).

101. (Masterman: (1909) 1960, 70).

102. (McDougall: 1907a, 86).

103. Ibid, 89.

104. (McDougall: 1914a).

105. Indeed, he later noted that he encouraged Cyril Burt and H.B. English to carry out such a programme of work (McDougall: 1921a, vii).

106. (McDougall: 1921b, 194-95).

107. (McDougall: 1912a, 243-44), see also (McDougall: 1912b) for an extended argument on this theme.

108. (McDougall: 1922, 34).

CHAPTER 7

WILLIAM McDOUGALL AND THE SCIENCE OF THE SOUL

Values are involved in the selection of the problems we study; values are also involved in certain of the key conceptions we use in our formulation of these problems, and values affect the course of their solution.

C. Wright Mills
The Sociological Imagination
(Penguin: Harmondsworth, (1959) 1970, 89.

One of the crucial tasks for the social history of science is to show precisely how scientific knowledge is linked to its social context. It is with the aim of going some way towards such a goal that the present chapter is concerned. Previously I discussed the issue of the relationship between mind and body as it was seen in late Victorian Britain, through a consideration of the writings of the psychologist William McDougall. I now want to build on that analysis to indicate the place of his philosophy of nature — his Animism and psycho-physical interactionism — in his scientific work.

William McDougall's scientific work ranged over a wide area. He made contributions to experimental psychology, physiological psychology, evolutionary theory and social psychology. A fair assessment of his writings would, however, recognize that after the publication of his Introduction to Social Psychology (1908) he engaged in little experimental work for the rest of his career. Indeed, in the mid-1920s, after his emigration to the United States, he could be described in the following way:

> Strictly speaking, McDougall is not an experimental psychologist. He is rather a speculative psychologist, belonging to the school of Ward and his followers.... The American psychologists do not regard his work as scientific, in the strict sense of the term.[1]

This should not, however, stop us recognizing that the majority of his work in the 1900s had a sound experimental basis. On his move to Oxford in 1904 he was viewed as "a very good man in his line...a physiologist and medicine man, who will want a lab."[2] In this chapter I shall consider three areas of research to which McDougall made a contribution: physiological psychology, social psychology and evolutionary theory. My argument will be that McDougall's philosophy of nature lay at the core of his work in these areas and structured it at a basic level. Thus, it was through the intermediacy of his socially conditioned philosophy of nature that McDougall's scientific work was linked to its social context.

The Citadel of the Will: Animism and Physiological Psychology[3]

McDougall's initial training in medicine was more than adequate to equip him to conduct detailed physiological research. During his years at Cambridge and St. Thomas' Hospital he specialized in physiology and two of his first published papers were concerned with proposing an original theory of muscular contraction.[4] Between 1897 and 1911 he published extensively on various topics in physiological psychology. This included five papers published in Brain, the journal of the Neurological Society. During his period at Cambridge McDougall's future aims had undergone a shift:

> The most important effect of my reading at this time came from William James' Principles of Psychology. I had, while still an undergraduate, determined that a life devoted to the study of the nervous system was the most desirable of all; for in the brain, it seemed to me, were locked the secrets of human nature. But James showed me that neurological research is not the only road to the uncovering of these secrets, and led me to believe that they should be approached from two sides, from below upwards by way of physiology and neurology, and from above downwards by way of psychology, philosophy and the various human sciences.[5]

Over the following decade McDougall devoted himself to 'unlocking the secrets of human nature' by engaging in an extensive research programme in physiological psychology. From McDougall's perspective one of the key tasks which he had to undertake was to specify where and by what means mind-body interaction took place. This aim formed a central element in his research in physiological psychology.

Whether there existed a seat of the soul was a topic which had aroused considerable interest and debate long before the nineteenth century. For example, it was thought by many observers that the various sensory processes which together determined a single state of consciousness must themselves came together in a single area or organ of the nervous system, (eg. in Descartes' view, the pineal gland). The state of consciousness was then regarded as the psychical correlate of the unitary physical process.[6] During the nineteenth century, through the work of Gall,

Hughlings Jackson, David Ferrier and others, the doctrine of the localization of function in the brain was developed.[7] The results produced by this research convinced McDougall and others that attempts to find a unitary seat of the soul were without foundation.[8] This posed a problem, for if no area of the brain could be said to be the place where mind and body interacted, then how did it occur?

Other developments in physiology also appeared to contradict the idea of psychical intervention in physiological processes. Throughout the nineteenth century the concept of reflex action had been extensively developed. Experiments performed with decerebrated animals appeared to demonstrate that reflex movements were completely determined by a chain of purely physiological processes. The spinal cord, insofar as it was not composed of bundles of nerves passing to and from the brain, had been shown to consist wholly of complex connections between sensory and motor nerves which constituted nervous mechanisms for the production of reflex movements. By extrapolation this argument was extended upwards to include the brain itself. The structure of the brain was said to be essentially similar to that of the spinal cord and hence the same type of nervous processes operated there. Therefore, the operation of the brain could be explained by resort only to physiological processes and there seemed no need to invoke psychical intervention.[9]

McDougall fully accepted the view that the nervous processes of the brain were of the same type as the reflex processes of the spinal cord, that reflex action was the fundamental type of all nervous action.[10] He did not, however, accept the seemingly materialistic implications of this conception. McDougall argued that neither the doctrine of cerebral localization of function, nor that of reflex action as the paradigm of all nervous activity, need necessarily be at odds with his Animism.[11] Instead, he built upon the ideas of cerebral localization and reflex action to propose a theory which explained how and where mind-body interaction

took place.

In his first psychological paper, published in Mind in 1898, McDougall proposed a speculative hypothesis about interactionism which he subsequently supported by detailed empirical study. He argued that

> The assumption that consciousness is generated in some particular part of the brain...is quite unfounded and unnecessary.[12]

The theory which he put forward involved conceiving a state of consciousness being determined by a number of psycho-physical processes occurring simultaneously in different areas of the cerebral cortex. It is evident both from his published works and his autobiography that one resource which McDougall drew upon were the writings of Hermann Lotze, in particular his Metaphysik.[13] In this work Lotze had specifically proposed a speculative hypothesis that there were many areas in the brain in which mind and body interacted.[14] A further resource employed by McDougall was the neurone theory. At the turn of the century this theory was having an increasing impact on ideas concerning the nervous system. However, many details remained uncertain, particularly regarding the region at the junction of nerve cells. An understanding of these areas began to emerge in the work of C.S. Sherrington who, in 1897, coined the term 'synapse' for these junctions. For many years, however, the synapse remained a shadowy region.[15] This vagueness proved to be readily exploitable by McDougall and the concept of the synapse was the core around which he attempted to empirically substantiate his theory that mind and body interacted at numerous points in the brain.

McDougall was explicit about the possibilities opened up by the neurone theory in a paper published in 1901.[16] Here he provided evidence from anatomy, physiology and psychology to support the view that the synapses were the location of psycho-physical processes. In arguing this point McDougall drew heavily on the work of Sherrington and others which had demonstrated the overwhelming importance of the synaptic region in

the operation of the nervous system.[17] He argued that the immense variety of sensory experience was due to the complex fusion of sensations simultaneously emanating from the various sense organs. Sensory stimuli excites a number of psycho-physical processes in the sensori-motor arcs of the various sensation areas of the cerebral cortex:

> My proposition, that the synapses are the seats of the psycho-physical processes, involves the corollary that the state of consciousness of an individual at any moment is determined by several...psycho-physical processes occurring simultaneously in different parts of the cerebral cortex, the total state of consciousness being the resultant of a purely psychical fusion of the several affections of consciousness determined at the several synapses.[18]

This argument still left open the question of how the psychical fusion could be conceived to occur. McDougall considered that there were only two courses open. One could assume, with the later associationists such as J.S. Mill, that each psycho-physical process excited a corresponding psychical 'element' which then coalesce to form the complex sensation. McDougall, however, attacked this view by reiterating what was a classic argument against associationism — that it could not be assumed that two psychical elements merged into a third. He contended that the only other alternative was that what previous writers had termed 'psychical elements' were not independent elements at all, but were manifestations of a single 'substance or being'. This 'being', since it could act or be acted upon at several points in space simultaneously (i.e. at the various synapses of the sensation areas of the cerebral cortex) was not material substance. It must therefore, he argued, be regarded as <u>immaterial</u> substance or being:

> and this being, thus necessarily postulated on the grounds of the unity of individual consciousness, we may call the soul of the individual.[19]

Further, he considered that the evidence for a purely psychical fusion furnished

> solid ground for regarding the soul as being subject to its own peculiar laws, according to which the states or processes excited in it by the brain processes, interact

> with one another, and so bring it about that the soul acts upon the brain processes to modify them.[20]

Thus, in keeping with the tenets of his 'scientific supernaturalism' McDougall believed that he had demonstrated by empirical scientific methods that the soul existed. No longer was it an abstract entity postulated by philosophers; it was a real existent phenomena open to scientific investigation and validation. The theory of the purely psychical fusion of simultaneous sensory stimuli also provided McDougall with more material with which to fashion polemical ammunition to discredit the doctrine of psycho-physical parallelism. He asserted, somewhat weakly, that parallelism was quite simply incompatible with the evidence that sensations become fused into a unitary whole only by psychical means.[21]

In addition to arguing that mind and body interacted at the synapses of the cerebral cortex, McDougall also proposed a theory to explain how the mind could exert control over nervous processes and so over human conduct. This theory, which he termed his 'drainage theory', first made its appearance in his 1901 paper published in Brain.[22] This paper was the first in a long series on the subject which he produced over the next seven years. The theory was extensively developed in a number of papers in Brain, Mind, the British Journal of Psychology and in his book Physiological Psychology. This drainage theory formed the basis of a wide ranging research programme to explain phenomena arising from light and colour contrast, the operation of attention, the effects of drugs and fatigue on psychological activity, visual sensations and the physiological basis of hypnotism.[23]

In his 1901 Brain paper he claimed that authors of 'the highest authority' had argued that the charging of neurons with an 'undefined something' played an important part in the functioning of the nervous system. McDougall then argued that the neurons were indeed charged with something:

> I think that for the present it may be best conceived as a fluid, and I propose that this fluid shall be called 'neurin'.[24]

He argued that every neuron continually produced a small quantity of neurin, although those connected with the sense organs and the surface of the skin produced it in larger quantities. This neurin flowed through nerve pathways from places of 'high potential' to places of 'low potential'. In effect this meant that it flowed from sensory to motor neurones, passing across the synapses by a process of 'leakage' or 'discharge'. However, this passage of neurin did not leave the synapse unchanged, a 'charge' of neurin tended to reduce its 'resistance':

> We must assume that each discharge (of neurin) constitutes, or brings about in the inter-cellular substance, the delicate and specifically differentiated psycho-physical process. And we must further assume that each such discharge leaves the substance so changed that its resistance is permanently lowered.[25]

It is clear that McDougall was able to argue in these terms in part because the existing synapse concept was at this time little developed. Elsewhere this indeterminacy enabled him to speculate that at the synapses of the cerebrum was a special substance, "presumably the most highly specialized of all forms of organic matter".[26] It was through the regulation and control of the flow of neurin that mind could act on the body and that body could affect mind.

In addition to providing an explanation of how mind-body interaction occurred, McDougall's drainage theory was also developed with the aim of providing an account of what were seen at the time to be puzzling phenomena in the physiology of the nervous system. The period at the turn of the century was one in which great changes were taking place within physiology as a whole. Although many experiments had been performed concerning, for example, nerve conduction, many unsolved problems remained. McDougall's drainage theory was explicitly aimed at providing a unifying explanation for these many as yet little understood phenomena:

> The view of the charging and discharging of neurones not only brings under one point of view the loss of time at the synapses and the rhythmic discharge in the efferent nerves, but it is supported and, we may almost say, necessitated by an array of facts that find a ready explanation through it. Of these the chief are certain peculiarities of the reflex response, the phenomena of summation of stimuli and facilitation, and certain facts which prove the existence of a state of residual excitement or rather the persistance of residual charges of neurin after the passage of excitation.[27]

McDougall's drainage theory drew upon several existing accounts of the physiology of the nervous system.

A theory which was similar in many respects was proposed by Herbert Spencer in his Principles of Psychology (1855). For example, Spencer wrote of 'nerve energy' flowing through centres of 'low resistance'. He did not, however, work this theory out in any great detail. Neither, of course, did he link it in any way with psycho-physical processes or an immaterial soul.[28] It is moreover unclear whether McDougall explicitly drew upon Spencer's writings. He did, however, certainly draw upon William James' Principles of Psychology (1890). James put forward a theory which was similar in many respects to McDougall's. He argued that 'nerve currents' in the cerebral cortex followed pathways of 'least resistance' and that if these were blocked or cut paths which were formerly more resistant became those of least resistance under the changed conditions.[29] In one of the first papers in which McDougall introduced his drainage theory he explicitly referred to this work of James.[30] Another source of McDougall's drainage theory lay in the work of C.S. Sherrington, who had perhaps the greatest influence on McDougall's physiological writings.[31] The phenomena which McDougall sought to explain by his drainage theory in his 1901 Brain paper had all been thoroughly investigated by Sherrington in the 1890s and McDougall explicitly referred to this work on numerous occasions.[32] Further, McDougall premised a great deal of his physiological research on one of the key themes in Sherrington's work of this period: that the unit of integration in the organism was the reflex nervous arc.

One of the key phenomena to which McDougall applied his drainage theory was that of inhibition. At the turn of the century inhibition was one of the main concepts of physiological theory. It was a concept which had been in use throughout the nineteenth century. Basically it referred to the way that nervous impulses not only excite, but also repress motor effects or organ activity. The investigation of inhibition arose out of studies of reflex action. During the latter part of the century an increasing interest was shown in the question of the modifiability of reflex action and there was a growing awareness that problems of nervous function were not solved by the analysis of behaviour into simple reflexes.[33] The body was conceived as functioning as a unit, and activated by the simultaneous cooperation of a large number of physiological mechanisms. This unity required the repression of some processes and the facilitation of others. In physiological theory the explanation of how this was achieved revolved around the concepts of 'inhibition' and 'facilitation'. The concept of inhibition occupied a central role in Sherrington's studies of the 1890s and in his Integrative Action of the Nervous System (1906). Sherrington argued that a combination of inhibitory and excitory nervous pathways was fundamental to the integrative action of organisms possessing nervous systems. At the turn of the century, however, the nature of the mechanism of inhibition was unclear and Sherrington confessed that "we do not yet understand the intimate nature of inhibition."[34] Various competing theories were proposed in an attempt to provide an explanation of inhibition; one of these was McDougall's drainage theory.[35]

McDougall's first account of his explanation of inhibition is contained in a paper published in Brain in 1903.[36] After reviewing existing explanations for inhibitory action, including Sherrington's, McDougall outlined his view of the role played by inhibition in the functioning of the nervous system:

> It appears...that the inhibition of a mental process is always the result of the setting in of some other mental process, and, if we consider the underlying physiological processes, we see that this means that the inhibition of the excitement of one neural system is always the result of the excitement of some other system, that inhibition appears always as the negative or complementary result of a process of increased excitation in some other part. This fact suggests that inhibition is essentially the result of a process of competition, and many psychologists have given expression to this conception in some vague phrase as: The mind has only a limited quantity of energy, which will not suffice for the simultaneous maintenance of the mental processes.[37]

McDougall is drawing heavily upon Sherrington's work here, in particular his researches on 'reciprocal innervation' — the view that inhibition occurs side by side with excitation of other muscles opposed to those which are being inhibited.[38] McDougall now presented an account of how his drainage theory could be applied to account for the phenomena of inhibition:

> inhibition means a switching off of the current of energy or neurin, and that a movement of attention means the switching off of the current from one path of forward conduction in the higher levels of the brain and the turning of it into some other similar path which, through a complex constellation of influences, has become at that moment the path of least resistance in those higher levels. The relation of reciprocal inhibition obtaining between all the different organized neural systems, constituting paths of forward conduction in the higher brain levels, is due, I suggest, to the fact that they all drain one common store of neurin contained and constantly generated in the interconnected mass of the afferent neurones, and seeking constantly to escape by the paths of least resistance into motor neurones, and so into the muscles. The higher level paths are brought into activity only when the store of neurin attains a certain potential or head of pressure, which degree of pressure is an essential condition of attentive consciousness. And only one of these higher level paths can be active at any one moment, because any one of them is capable of carrying off the whole surplus of neurin...[39]

McDougall conducted an extensive amount of empirical research over the next five years on this hypothesis, particularly concerning the study of sensory processes. For example, he explained both the phenomena of light and colour contrast and the very intense contrast effects produced by a smoothly graded zone of transition between the two contrasting zones by

means of it.[40] It is clear that McDougall's drainage theory was seen as an important development in neurophysiology in the 1900s and that he drew extensively on Sherrington's work on inhibition. One further aspect of the latter's work on inhibition he accepted was that it occurred at the 'central' end of afferent neurones, at the synapses of the cerebral cortex rather than at a local, such as spinal level.[41] The view that inhibition was a 'central' phenomena formed part of McDougall's more general conception of the nervous system.

The view that inhibition occurred at a 'central' position was part of a wider conception of the central nervous system as a series of 'levels', with each controlling the one below. This concern with levels of control of the body appears to have been a recurrent theme throughout nineteenth century neurophysiology.[42] Nevertheless, the conception of the nervous system in these terms received a new impetus following the publication of the evolutionary theories of Spencer and Darwin. During the 1860s the neurologist John Hughlings Jackson developed a theory of the evolutionary development of the nervous system which was based upon three separate 'levels'. The lowest was the most organized and least flexible; the highest the least organized and was the one with which consciousness was associated. Jackson considered the human nervous system to have arisen from the simplest and least differentiated and most automatic level by a process of steady differentiation. Further, the effect of nervous disease was to 'reverse' the evolutionary process and to lead to the dissolution of function.[43] The theory that the nervous system developed as a series of levels enjoyed a wide currency in the late nineteenth century. One example of the employment of this perspective was in the famous experiment on cutaneous sensations performed by W.H.R. Rivers and Sir Henry Head between 1905 and 1908. This experiment involved the severing and rejoining of a nerve in Head's forearm and the careful investigation of the gradual return of sensation to the

affected area. Rivers and Head described the recovery as occurring in two stages. They argued that in the first ('protopathic') stage a more primitive part of the nervous system was being observed; in the subsequent ('epicritic') stage a return was being made to the fully evolved human nervous system. Their work flowed from the concept of the newest evolved higher level restraining the less developed lower one.[44]

At the heart of McDougall's view of nervous activity was a conception that the nervous system consisted of three hierarchical levels. This schema was laid out in his 1898 Mind paper and formed the basis of his book Physiological Psychology.[45] In this latter work he referred his readers to Michael Foster's Textbook of Physiology (1877) as further reading; this was a work in which the concept of a series of nervous levels was implicit. McDougall argued, in a similar manner to Hughlings Jackson, that the lowest level was the most organized and did not involve consciousness; the middle level was more complex and was only a little modifiable; the highest level was the least organized and involved in particular the operation of consciousness. The higher levels had, he held, evolved on top of the lower ones, functioning as mechanisms of control for them. Thus, under the influence of drugs a 'reversion' to a lower stage of development was possible:

> In an early stage of drunkenness, the ruder, more primitive instinctive impulses are apt to make themselves effective, because they are no longer controlled by the mass of partially organized mental systems that represent the social training and finer points of character of the individual.[46]

Although he argued that inhibition was present at all three levels he additionally argued that the higher levels acted as inhibitory centres for the lower levels. Thus, the 'beast within' was held in check by the nervous concomitants of civilization.[47]

McDougall almost certainly owed his belief in this conception of the nervous system to W.H.R. Rivers. He was taught by Rivers at Cambridge and went with him on the Cambridge University Anthropological Expedition

to the Torres Straits in 1898-99. In addition he assisted Rivers to undertake experiments on vision at this time.[48] Following the Torres Straits expedition McDougall was involved with Rivers in founding the British Psychological Society in 1901 and the British Journal of Psychology in 1904. He also assisted Rivers with the experiments on fatigue which formed the basis of Rivers' Croonian Lectures to the Royal College of Physicians in 1906.[49]

Using his view of the nervous system consisting of three mutually distinguishable levels, McDougall developed an account of the means by which the mind (or soul) and body interacted. He argued that it was in the synapses of the highest of the three levels that such interaction took place. For example, he argued that the act of volition always involved the voluntary concentration of attention upon one object and that its physiological result was a higher degree of concentration of 'neurin' along only one system of nervous arcs in the highest nervous level. The latter was necessary, he argued, since it means that attention is narrowed to only one object at a time and hence only one mode of activity is possible at a time.[50] The physiological effect of the act of volition was the inhibition of lower levels:

> the Will concentrates along one system of channels
> the free nervous energy of all the brain at the moment,
> and hence the greater and more widespread the excitement
> of the brain, the greater the outflow along motor channels
> that the Will can determine, and the more complete the
> inhibition of all other processes.[51]

The way in which the Will acted was by changing the resistance of the synapses. Since according to his 'drainage' theory, neurin flowed along paths of least resistance, then if the action of the mind was to make one path of lowest resistance then the willed actions would follow.[52] This physiological theory, explaining the means by which volitional acts were performed was McDougall's tour de force: he had laid bare the process by which mind directed body and thus the higher levels exerted control over

the lower levels. This process was one which McDougall considered to be inexplicable by the supporters of Mechanism:

> The concentration of nervous energy that results from the volition is unlike the behaviour of all known kinds of physical energy, the universal law of which is diffusion from places of higher potential to places of lower potential. In volition we seem to concentrate nervous energy from places of low potential into the place of highest potential, and perhaps we shall have to recognise in this concentration of nervous energy a unique effect of psychical activity.[53]

McDougall continued to believe in the existence of neurin, or nervous energy, even towards the end of his life. In his Abnormal Psychology (1926) and Energies of Man (1932) he appealed to his concept of 'neurin' to account for hypnosis, suggestibility and the phenomena which had begun to be investigated by the various 'schools' of psychoanalysis. In particular, in the Energies of Man he committed himself to a belief in what he termed 'homic energy' which was not subject to normal scientific laws:

> Does mental activity involve some form or forms of energy other than those recognized by the physical sciences? In view of the purposive nature of human activity, the positive answer to this question seems inevitable. We must postulate some energy which conforms to laws not wholly identical with the laws of energy stated by the physical sciences.[54]

It is clear that McDougall's philosophy of nature played a central role in the development of his physiological psychology and set the agenda for his research. His work in this area constitutes a detailed working through of the belief that mind and body interacted and that this could be studied by empirical methods. Thus, he argued that such interaction took place at the synapses of the cerebral cortex, that inhibition and other phenomena could be accounted for by his 'drainage' theory, and that the mind operated on body and vice versa by alterations of the resistance of the synapses. The work which McDougall produced had a sound basis in existing physiological theory and, as I have indicated, his work was

viewed with some respect by other researchers. In addition to providing what he saw as empirical support for his belief in Animism and mind-body interaction, McDougall also solved to his own satisfaction a number of outstanding physiological and psychological problems.

The Springs of Human Conduct

William McDougall's theory of instinctive behaviour is perhaps his most influential and provocative contribution to psychology. Many of the methods of study and conceptual analysis of instinct used in comparative ethology today have their roots in the work of McDougall, among others.[55] Soon after the publication of the fullest exposition of his instinct theory, in Introduction to Social Psychology (1908), McDougall became embroiled in controversy and this became increasingly intense, particularly in the 1920s after he emigrated to the United States.[56] McDougall was by no means the first instinct theorist, they had been discussed in one form or another for centuries.[57]

In Chapter Seven of the Origin of Species Darwin discussed instinctive behaviour extensively, particularly with reference to insect life. As is well known he refrained from discussing his views on humans, noting only that

> In the distant future I see open fields for more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history.[58]

Others, however, were not so reticent and people such as A.R. Wallace began to apply natural selection to human mental evolution and make their views public.[59] Darwin did not make his psychological views very explicit and never investigated the subject systematically. He tended instead to draw upon various well known psychological theories.[60] In the Descent of Man (1871) Darwin argued that human beings had not been exempt from the process of evolutionary development. He applied evolutionary theory to

account for the distinctive features of the human species, its anatomical structures, sexual characteristics and especially its mental faculties:

> the difference in mind between man and the higher animals, great as it is, certainly is one of degree and not of kind. We have seen that the senses and intuitions, the various emotions and faculties, such as love, memory, attention, curiosity, imitation, reason, etc., of which men boasts, may be found in an incipient, or even sometimes in a well developed condition, in the lower animals.[61]

He was concerned to stress both the continuity in evolutionary development from other animals to humans and to argue that their behaviour could be explained by the same principles.[62] He argued that instincts were present in humans and in other animals.

In accord with his broader view of evolutionary development, Darwin postulated two sources of instincts. Firstly, he argued that they could be produced by the process of natural selection preserving actions which were beneficial to the animal. Secondly, instincts could be the result of the inheritance of acquired characters: intelligent actions becoming habitual and over a number of generations instinctive.[63] Darwin did however, place his emphasis on natural selection and relegated the production of instincts by the latter means to a subsidiary role.[64] In common with his psychological views as a whole, Darwin did not develop his thoughts on instincts in any great detail and passed much of his material on the subject to his friend G.J. Romanes.

In his Animal Intelligence (1882), Mental Evolution in Animals (1883) and Mental Evolution in Man (1888), Romanes continued Darwin's work and pioneered the study of comparative and developmental psychology.[65] These books were united with the overarching purpose of vindicating Darwin's judgement that the minds of animals and humans were similar in their mental make up.[66] Following Darwin, Romanes argued that there were two sources of instinct — natural selection and 'lapsed intelligence', intelligent actions becoming habitual and eventually inherited instincts.[67] He did, however, move beyond Darwin's discussion of instinct and extended it in

two important directions: he argued that instinctive behaviour was a form of reflex action and that it involved consciousness.[68] Romanes' work in comparative psychology was to prove influential, particularly in the work of Conwy Lloyd Morgan, who extended the Darwinian tradition in a series of works from the late 1880s.[69]

McDougall's theory of instinctive behaviour owed a great deal to the tradition of Darwin, Romanes and Lloyd Morgan. He explicitly acknowledged his debt to Darwin, stating that

> Darwin, in his Descent of Man (1871) first enunciated the true doctrine of human motives, and showed how we must proceed, relying chiefly upon the comparative and natural history method, if we would arrive at a fuller understanding of them.[70]

McDougall extended the Darwinian tradition in several ways. Firstly, he provided a detailed physiological basis for instinctive action. Secondly, he developed a much fuller account of the role of instinctive behaviour in human societies than previous authors. As I argue below, McDougall's philosophy of nature played a key role in his account of the physiological basis of instincts.

In his book Physiological Psychology (1905) McDougall presented a clear and forceful statement of what he saw as the value of psychology:

> Psychology may be best and most comprehensively defined as the positive science of the conduct of living creatures ...it is the science which attempts to describe and explain the conduct of men and other living creatures.[71]

Both this book and his Introduction to Social Psychology (1908) are built around this perspective: both are aimed at providing an account of the springs of human conduct. In 1905 McDougall argued that instincts were inherited and that

> Man has many instincts but most of them mature slowly, and his capacity for learning by experience, i.e. for modifying the congenital systems and developing new ones, is so great that the manifestations of their activity are commonly overlaid and more or less obscured by acquired modes of action. Nevertheless, they form the determining groundwork of his nature and are apt to rough hew the forms of his activities, shape them how he may in detail.[72]

He did not, however, take up the theme of instinctive behaviour in any great length here — he was after all writing a 'Primer' of physiological psychology for use by students. Three years later he presented a full account of his theories.

In his Introduction to Social Psychology (1908) McDougall's over-arching aim was to explain how instinctively endowed human beings could achieve a great degree of civilization.[73] He argued that instincts were 'innate specific tendencies' of the mind common to all members of a species. They had, he claimed, slowly evolved in the process of the adaption of the species to its environment and they could not be eradicated from an animal's mental make up or acquired by individual members of a species during their lifetime.[74] He presented instincts in an all encompassing light, arguing that they formed the basis not only of individual action but also of the nature of societies:

> The mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action whether individual or collective, and are the basis from which the character and will of individuals and nations are gradually developed under the guidance of the individual faculties. These primary innate tendencies have different relative strengths in the native constitutions of the individuals of different races, and they are favoured or checked in very different degrees by the very different social circumstances of men of every race and of every age.[75]

He did, however, add that although instincts were innate they were, with only a few exceptions, undeveloped in the first months of life and only matured at various times throughout the years from infancy to puberty.[76]

McDougall also introduced a complex system of conceptual categories for classifying human behaviour. First, in common with other instinct theorists such as William James and Lloyd Morgan, McDougall produced a list of 'fundamental' instincts. He argued that there were seven 'major' instincts, each of which was accompanied by a 'primary emotion'.[77] In addition he postulated the existence of four 'minor' instincts which played only a small role in the genesis of emotions.[78] Along with

'crawling' and 'walking' these eleven instincts were all that he considered could be recognized with certainty in human behaviour.[79] McDougall's framework also, however, involved postulating the existence of what he termed 'general or non-specific tendencies', the most important of which were suggestion, imitation and sympathy. He argued that they should be considered apart from instincts since at the core of the latter was a permanent nucleus the excitement of which was accompanied by an emotion and an impulse to act towards a particular end. The non-specific tendencies, however, did not have such a particular narrow character but had been formed by a process of differentiation from the primary instincts themselves when the mind had achieved a certain degree of complexity in the course of evolutionary development.[80]

This framework of 'major' and 'minor' instincts and 'non-specific tendencies' formed a schema by which McDougall offered an explanation of the behaviour of both individuals and societies. For example, he considered that the instinct of curiosity was the basis of science and religion; that of gregariousness provided an explanation of the gathering together of people in a crowd and for their grouping together in cities even when this was in squalid conditions.

In his discussions of instinctive behaviour McDougall provided an account of its physiological basis. I noted earlier that McDougall, following Hughlings Jackson, Rivers and others, regarded the nervous system as consisting of three 'levels' with the higher 'levels' exerting control over the lower ones. In his first published psychological paper McDougall argued that instinctive reactions had their physiological basis in the second 'level' of evolutionary development of the nervous system (anatomically the pons cerebri and cerebellum) and that they were congenital and only a little modifiable during a person's life.[81] Over the following decade he expanded and built upon this view. In common with some other instinct theorists, such as Romanes, McDougall argued that in each case of

instinctive behaviour a sense impression, or combination of sense impressions, led to the performance of a certain action which would be the same on all similar occasions in all individuals of the same species.[82] Further, in his Physiological Psychology he argued that the neural system responsible for perception consisted of a complex of sensory-motor arcs of all three 'levels' of the nervous system. Some perceptual systems were, he said, "congenitally organized", although this could mean that they were not fully organized at birth but had an inherited tendency to develop in a certain way. Others, however, in the highest 'level' were built up through the course of an individual's experience.[83] It was the 'congenital perceptual systems' which McDougall called instincts and which were excited when an appropriate object was perceived. For example, he argued that this was what happened when a newly hatched chicken pecked at any small particle on the ground near to it.[84] As in other areas of his work relating to physiological psychology McDougall deployed his 'drainage theory' to help explain the operation of instincts. He argued that the excitement of an instinct resulted in the production of a quantity of 'neurin' (or nervous energy) which spread throughout the nervous system and served to intensify and direct actions performed under the impetus of the instinct.[85]

Three years later in Introduction to Social Psychology McDougall adhered to the basic features of the foregoing account of the physiological basis of instinctive behaviour. He argued that since it was one sense impression, or group of sense impressions, amongst many which plays a predominant role in determining a particular type of behaviour, this implied that the nervous system was adapted to receive and respond to these sense impressions:

> Just as a reflex action implies the presence in the nervous system of the reflex nervous arc, so the instinctive action also implies some enduring nervous basis whose organization is inherited, an innate or inherited psycho-physical disposition, which, anatomically regarded, probably has the form of a compound system of sensori-motor arcs.[86]

McDougall's account of instinct in terms of its physiological structure was not, however, entirely novel — others had previously gone some way towards such an account.

In his Principles of Psychology (1855) Herbert Spencer argued that reflex action and instinctive behaviour were the result of nervous organization and that they only differed by way of their complexity. For Spencer the basis of reflex action was the most primitive form of nervous organization and resulted through an animal's efforts to adjust to its environment. Instincts were quite simply complicated chains of reflexes.[87] In the Descent of Man (1871) Darwin concurred with Spencer that instincts were a more complicated form of reflex action. Darwin's 'disciple', G. J. Romanes extended his mentor's discussion, arguing that instinctive behaviour was a form of reflex action but also that it involved consciousness:

> The most important point to observe in the first instance is that instinct involves mental operations, for this is the only point that serves to distinguish instinctive from reflex action. Reflex action... is non-mental neuro-muscular adaption to appropriate stimuli; but instinctive action is this and something more, there is in it the element of mind.[88]

Thus, in Romanes' presentation instincts were not simple mechanical reflexes but were actions evoked by mental perceptions; instinctive behaviour involved cognitive interpretation of sensory stimulation. It is thus clear that McDougall was working within these existing ways of treating instinct as a form of reflex action. It is, however, to William James' Principles of Psychology that we must turn once more for a prime source of McDougall's account.

James was fascinated by the evolution of the brain and nervous system and by Darwin's account of the physiological expressions of emotions in humans and other animals and by his discussions of the origins of human traits.[89] In his Principles James provided an extensive treatment of instincts, employing natural selection to account for their origin and

development.[90] He argued that instincts were the functional correlates of structure, that instinctive actions conformed to the general reflex type and that they were directly stimulated by determinate sensory stimuli.[91] Further, he held that no matter how well endowed an animal was with instincts its resultant actions would be extensively modified when the instincts were overlaid with the effects of experience.[92] In arguing these points James was of course continuing the tradition of Spencer, Darwin and Romanes. In James' work, however, human instincts are the main objects of his analysis.[93] In human behaviour he recognized, for example, the instincts of imitation, emulation, pugnacity, sympathy, fear, acquisitiveness and parental love.[94]

McDougall's account of instincts owed several of its features to James' work. Firstly, it will be evident that James' list of instincts is in many ways similar to McDougall's. Secondly, James gave a more detailed account of the nervous basis of instincts than previous theorists. Thirdly, James firmly linked instincts to emotions.[95] McDougall took James' account further in several directions, for example he drew upon Sherrington's researches in the nervous system of the 1890s to provide a fuller and more experimentally based account of the physiological basis of instinctive behaviour. McDougall's accounts of instinct did, however, differ from that of James and others in two main ways. In his account of the basis of instincts he stressed that instinctive action fundamentally involved a mental process and a striving towards an end. Secondly, he presented a much fuller, more detailed and more subtle account of the role played by instincts in the ordering of human societies.

McDougall's account of the basis of instinct was like other areas of his physiological work predicated on his Animism and psycho-physical interactionism. Throughout his psychological writings McDougall presented a conception of mental processes consisting of three parts: cognition, affection and conation. He derived this neo-Kantian terminology from the

writings of Ward and Stout, both of whom he recorded had influenced his work.[96] Accordingly he argued that every instinctive process involved these aspects of the mind. Further, he held that these mental operations had their basis in particular physical structures: the afferent, central and efferent parts of a reflex nervous arc. It was the central emotional (affective) core which McDougall viewed as characterising particular instincts and he believed that it was not capable of modification through experience.[97]

McDougall argued that in the instinctive process the multitude of sense impressions received by the sensory organs were combined in a psychical unity. It was this which he believed to be an essential condition for the operation of the motor reactions of the instinctive act. The psychical unity was an essential link between the multiplicity of sense impressions and the numerous physical movements which constituted the train of instinctive behaviour. It was the psychical unity which evoked the 'conative tendency' by which the whole process was maintained.[98] In presenting his view that instinctive behaviour fundamentally involved a mental process McDougall once more explicitly mounted an attack on Mechanistic forms of explanation which excluded the interaction of mind and body. If it could be shown that each part of the complex muscular reaction which constituted an instinctive action corresponded to and was directly evoked by one element of the complex of sensory stimuli by means of a reflex nerve pathway, one would, McDougall reasoned, have a purely Mechanistic explanation.[99] In particular, McDougall attacked the tradition of instinct theory begun by Spencer and Darwin which simply viewed them as a more complicated form of reflex action. For McDougall, however, instincts were more than innate dispositions to certain kinds of movements:

> even the most purely instinctive action is the outcome of a distinctly mental process, one which is incapable of being described in purely mechanical terms, because it is a psycho-physical process, involving psychical as well as physical changes, and one which, like any other mental process, has, and can only be fully described in terms of, the three aspects of all mental process — the cognitive, the affective, and the conative aspects; ...every instance of instinctive behaviour involves a knowing of some thing or object, a feeling in regard to it, and a striving towards or away from that object.[100]

This view that instincts involved a psycho-physical process was a consequence of McDougall's philosophy of nature. A few years after the publication of his Introduction to Social Psychology McDougall drove his point home rather more forcefully:

> I hold that the instincts are essentially differentiations of the Will to Live that animates all organisms and whose operation in them makes the essential difference between their psycho-physical activities and the physical processes of inorganic nature.[101]

After 1908 McDougall laid increasing stress on the view that instinctive behaviour exhibited what he saw as the unique characteristic of all mental processes — a purposive striving towards the natural end of the process.[102] In the 1920s and 30s McDougall argued at length that purposive striving was a fundamental characteristic of all animal life.[103]

The particular features of McDougall's instinct psychology which set it apart from that of other theorists can be demonstrated in several ways. An example which illustrates the difference concerns his discussion of instincts and emotions. In linking the two McDougall was once more drawing on James' Principles of Psychology. Immediately after his chapter on instincts James placed one on emotions.[104] Here he argued that instinctive reactions and emotional expressions were part of the same process; every object which excited an instinct also excited an emotion. He proposed a new theory of emotional expression, the essence of which he stated to be that:

> My theory...is that the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur IS the emotion.[105]

This theory became known as the James-Lange theory of emotion (Carl Lange proposing a very similar theory) and it provoked extensive disputes over the ensuing years. McDougall devoted a chapter to the emotions in Physiological Psychology in which he discussed James' theory at length.[106] He accepted James' view that organic sensations were the essentials of emotion, but argued that one had also to realize that emotions could be experienced in the absence of sensory input to the brain from the visceral organs.[107] Further, he argued that James' view that bodily changes preceded emotional excitement could not be accepted and that the experiencing of an emotion may precede the bodily changes and could even occur in their absence. The causal question of whether an emotion played a part in determining conduct was in McDougall's view a special case of the more general question of psycho-physical interaction; the answer for him was of course positive.[108] He clearly stated his view on the relation of instincts to emotions:

> So it has come about that in the past psychologists have commonly treated of the instinctive actions of animals and the emotions of man, failing to realize that instinctive actions and emotions are but two different manifestations of the one process, the objective and subjective effects of the excitement of inherited perceptual dispositions.[109]

The gulf which existed between McDougall and other instinct theorists is, perhaps, most clearly displayed in a symposium on 'Instinct and Intelligence' organized jointly by the British Psychological Society, Aristotelian Society and Mind Association in July 1910.[110]

There were five participants in this meeting: McDougall, C. Lloyd Morgan, C.S. Myers, G.F. Stout and H. Wilden Carr; all except Carr were by this time major figures in British psychology.[111] McDougall's stated position on instincts contrasted most strongly with that of Lloyd Morgan. The latter had inherited the mantle of the Darwinian instinct tradition from Romanes and by the time of the symposium was recognized as the leading figure among animal psychologists.[112] In a series of works:

Springs of Conduct (1885), Animal Life and Intelligence (1891), An Introduction to Comparative Psychology (1895) and Habit and Instinct (1896) he had developed a detailed account of behavioural and comparative psychology. In Habit and Instinct he described instincts as

> congenital, adaptive, and coordinated activities of relative complexity...involving the behaviour of the organism as a whole. They are not characteristic of individuals as such, but are similarly performed by all alike members of the same more or less restricted group ....[113]

He also argued that instinctive behaviour was the result of innate nervous organization. Instinctive behaviour could, however, be distinguished from reflex action: the latter was a restricted response involving a definite group of muscles and usually initiated by a simple external stimulus; instincts he considered engaged the whole animal and required the cooperation of several organs and groups of muscles and resulted from a more complex pattern of sensory stimulation.[114] His conception of instincts was thoroughly mechanistic and he viewed their nervous basis to be similar to that of reflex action. Thus, he stated:

> I regard the cerebral hemispheres as the differentiated control system and conceive that they play no functional part in the automatism of instinctive behaviour.[115]

Lloyd Morgan's conception of instincts was informed by his philosophical presuppositions. He professed a form of Monism according to which the same entity manifested both physical and mental properties and that psycho-physical dispositions could be studied from either a physical or mental point of view. He also, however, held fast to a Humean empiricism and argued that the researcher should concentrate on the objective, empirical description and analysis of instinctive behaviour.[116] In his view a strictly Mechanistic interpretation of natural processes was the only kind permissible within science; 'metaphysics' had to be excluded from scientific theorising and

> the doctrine of interaction and that of (psycho-physical) parallelism must both be set aside, partly because they are from the standpoint of science unnecessary, partly because they are charged with metaphysical implications.[117]

He was hostile to the view that some 'vital force' should be referred to in explaining the organic realm and explicitly argued that psychology had to be constructed without reference to the concept of the soul.[118]

In his contribution to the symposium McDougall argued that Lloyd Morgan's Mechanistic interpretation of natural processes led him to ignore the most fundamental aspects of the instinctive process: that it did not result from purely mechanical reflex action; that it involved a mental process; that it had a conative or purposeful striving character.[119] It is thus clear that their differing philosophies of nature were fundamentally implicated in their differing conceptions of instinctive behaviour.[120]

McDougall's account of the nature of instinctive behaviour and the mechanism for its operation was thus in contrast to that of many of his contemporaries. His account was also distinctive in another way. He carried the concept of instinctive behaviour further than other theorists and set out to provide an answer to the question of how instinctively motivated human beings could achieve a high level of civilization:

> men are moved by a variety of impulses whose nature has been determined through long ages of the evolutionary process without reference to the life of men in civilized societies; and the psychological problems we have to solve, and with which this book is mainly concerned, is — How can we ever account for the fact that man so moved ever came to act as they ought, or morally and reasonably?[121]

He provided a detailed account of how the individual was integrated into society and how human society was sustained. The basic means by which McDougall argued this was achieved was through the operation of the 'sentiments'.[122]

To a great extent McDougall owed his conception of sentiments to A. F. Shand, a psychologist of independent means who was one of the founders of the British Psychological Society.[123] In an article 'Character and the Emotions', published in Mind in 1896, Shand argued that

emotions were the basic human tendencies and that sentiments were complex organized systems of these basic tendencies.[124] Although he intended to revise and expand upon this important paper it was not until eighteen years later that his book The Foundations of Character appeared.[125] Nevertheless, Shand's theory of sentiments generated considerable interest, particularly through the efforts of the editor of Mind, G.F. Stout. In the second edition of his popular textbook A Manual of Psychology, Stout adopted Shand's division between emotions and sentiments and two years later invited him to contribute a chapter to his new textbook The Groundwork of Psychology (1903).[126]

McDougall did not, however, adopt Shand's theories directly. Whereas Shand had regarded sentiments as being innate McDougall considered that they were formed over a period of years by originally separate emotions becoming patterned and interlinked through experience. Further, he argued that sentiments were a system of emotional dispositions organized around the objects which excite them. For example, in the case of the sentiment of Hate he considered that two of the emotions most prominently involved were those of fear and anger. He argued that these should not be regarded as being directly connected with one another but only indirectly linked through the association of each with the particular object of this sentiment of hatred.[127] It was upon the formation of sentiments that human societies were built:

> The growth of the sentiments is of the utmost importance for the character and conduct of individuals and of societies; it is the organization of the affective and cognitive life. In the absence of sentiments our emotional life would be mere chaos, without order, consistency or continuity of any kind, and all our social relations and conduct, being based on the emotions and their impulses, would be correspondingly chaotic, unpredictable, and unstable. It is only through the systematic organization of the emotional dispositions in sentiments that the volitional control of the immediate promptings of the emotions is rendered possible.[128]

Instinctive impulses were thus subject to voluntary control and regulation.

through the sentiments, especially self regard.[129] This sentiment was formed in children by social training, for example through a person's regard for the approval or disapproval of fellow human beings. The social acquisition of the idea of correct conduct overrode and controlled the instinctive base of behaviour:[130]

> my contribution to the theory of volition consists in applying the theory of the sentiments which we owe to the penetration of Mr. A.F. Shand to explain how...the self is able to ...control and suppress and override our strongest instinctive impulses and desires, and even to prompt and sustain action in opposition to them.[131]

Thus, human behaviour was not completely determined by its instinctive basis but was subject to the effects of social training.

McDougall's discussion of instincts and sentiments occupied roughly half the first edition of Introduction to Social Psychology. In the remaining chapters he used his theory of instinctive behaviour to provide a biological explanation for the development and organization of human societies. For example, he argued that the instinct of pugnacity played a role in the development of society. This instinct was, he asserted, responsible for the tribal conflicts which had once occurred in now civilized societies. Over a period of time, however, law and custom had discouraged unnecessary conflict between individuals and individual conflict had given way to collective conflict; individual pugnacity had been replaced by collective pugnacity (the latter being responsible for the militarism of contemporary Europe). The operation of this instinct was not, however, wholly injurious, it had, he claimed, been one of the essential factors in the evolution of a highly developed civilization, group conflict had developed the moral nature of human beings.[132] In presenting these arguments McDougall referred constantly to his experiences in Borneo. There is no doubt that the period which he spent in the Torres Straits with the Cambridge University Anthropological Expedition had a profound effect on his thinking about human social evolution. His experiences also served as a resource which he constantly drew upon to

provide examples to illustrate his theories. A decade later he returned to the Borneo region and wrote a book entitled The Pagan Tribes of Borneo (1912).

McDougall's account of social evolution was indebted to a long tradition of thought stretching back before the mid-nineteenth century. Writers such as Darwin, Greg, Bagehot, Galton and Wallace had portrayed the process of the development of civilization in terms of the struggle for survival between societies or social groups.[133] McDougall drew heavily on these earlier accounts of social evolution, in particular Bagehot's Physics and Politics (1872), Darwin's Descent of Man (1871) and E.B. Tylor's Primitive Culture (1881) are referred to extensively in his book.[134] Another major source of McDougall's account was the work of Benjamin Kidd, whose books Social Evolution (1894) and Principles of Western Civilization (1902) were immensely popular at the turn of the century.[135] McDougall's account of social evolution and of the role of instincts in human behaviour were part of a wider tendency in the 1890s and 1900s to consider human behaviour in biologistic terms.[136] McDougall shared with these other commentators such as Karl Pearson, collectivist and Social Darwinian principles and a belief that society needed reorganizing along rational lines.[137] These aspects of McDougall's and others' political philosophy were also, of course, of a piece with his commitment to eugenic policies.[138]

William McDougall's account of the mechanism of instinctive behaviour was thus predicated on his Animist, and interactionist philosophy of nature. For him the operation of instincts involved a distinctly mental process and was inexplicable in terms of simple mechanical reflexes. This account was one of the distinctive features of his whole theory of instinctive behaviour and was linked with his view that purposeful striving was another characteristic of such behaviour. He also drew upon existing accounts of the basis of instincts, refashioning them in accord with his own preconceptions.

The Mind in Evolution and the Evolution of Mind

From the time of his youth McDougall was intensely interested in the theory of evolution. He recorded in his autobiography how he had read nearly all the works of Spencer, Darwin, Huxley and Lyell's Principles of Geology before he had even graduated at Manchester University. He also took a great interest in the 'debate' on the relation of evolutionary theory to religious belief which still raged, delighting "in Huxley's smashing attacks on Gladstone and all the orthodoxies".[139] In his final year at Manchester he specialized in geology, led there partly by "the fascination of palaeontology as one of the great approaches to the study of evolution."[140] This interest in evolution formed one of the main strands in McDougall's published work. I shall discuss three aspects of this: his argument that the mind had undergone a process of evolution, that it had played a role in evolutionary development and finally, his adherence to a form of Lamarckianism.

The question of the origin of mind was one which had been addressed by many proponents of evolutionary theory in the late nineteenth century. In his Principles of Psychology (1855) Herbert Spencer argued that mind arose when the process of organic evolution reached a certain level of complexity. He wrote that

> If the doctrine of evolution is true, the inevitable implication is that Mind can be understood only by observing how mind is evolved.[141]

In his Descent of Man (1871) Darwin had argued that the features which distinguished humans most sharply from other animals — the intellectual powers and moral sense — had in a similar manner to physical attributes, been slowly and gradually acquired.[142] In keeping with his treatment of psychology in general, Darwin did not investigate the question of the origins of mind in any systematic manner; indeed he generally deferred on psychological questions to Spencer, Romanes and Huxley.[143] In the sixth edition of the Origin Darwin inserted a note that

> Psychology will be securely based on the foundation already well laid by Mr. Herbert Spencer, that of the necessary acquirement of each mental power and capacity by gradation.[144]

In his essay "On the Hypothesis that Animals are Automata and its History", T. H. Huxley considered the issue of the origin of mind. He claimed that animals and humans were conscious automata and that consciousness had continually evolved even though it possessed no efficacy in the functioning of the body. Evidence gained from comparing the brains of humans with those of other animals supported a belief in the proportional development of their functions. In Huxley's view animal consciousness arose with the evolution of nervous structures corresponding to the human cerebrum.[145]

G. J. Romanes developed many of Darwin's arguments not only with regard to instincts but also about the evolution of the mind. He presented a mass of largely anecdotal evidence to support the view that mental traits, including those thought to be distinctly human, had developed by accretion. He wrote:

> I hold that if the doctrine of Organic Evolution is accepted, it carries with it, as a necessary corollary, the doctrine of Mental Evolution.[146]

The advent of evolutionary theories provided two alternative explanations for the existence of the phenomena of mind: either it was argued that mind emerged from previously mindless matter when a certain degree of complexity had been attained ('emergentism'), or that consciousness was a feature of all matter ('panpsychism').[147] The former path was by far the one most commonly followed.[148] William McDougall firmly adhered to a type of emergentist evolutionary philosophy. In his first psychological paper he supported the view that mind had evolved and outlining the way in which it had been developed by the process of natural selection.[149] Throughout his career he continually argued that mind had emerged from previously mindless matter when evolutionary development had reached a certain point. Such emergentist theories had a considerable popularity around the turn of the century and were prominent in the work of Lloyd

Morgan, L.T. Hobhouse and Samuel Alexander among others.[150]

The issue of the origin of mind and consciousness was implicated in the late nineteenth century debate on the relation of mind to body. The postulate of the continuity of the evolutionary development of the organic and inorganic realms was picked up by critics of mind-body interaction. It was argued that if such continuity was established it justified the belief that organic processes, including those of the human brain, were determined by the same physical laws as inorganic matter. Hence, the view that there was psychical intervention in physical events was in error.[151] McDougall criticised this view, arguing that while complex molecules of living matter may have gradually begun to exhibit the characteristic signs of life and mind, this explanation was incomplete:

> there is every appearance of the incoming of a new factor with the first living things, a teleological factor which is capable of working against or controlling the physical law of the degradation of energy, a law which seems to rule throughout the inorganic world.[152]

To this he added the supplementary condition that certain physico-chemical conditions were necessary for the operation of this 'factor'; it only came into operation when a certain degree of complexity in the process of evolutionary development had been attained.[153] While accepting the view that mind emerged from previously mindless matter and the tenets of Darwinian evolutionism, McDougall reinterpreted these to conform with his anti-materialist philosophy.

In addition to arguing that the mind had undergone a process of evolution, McDougall's teleological philosophy led him to argue that the mind had played a role in evolution. This argument also provided him with yet another way of attacking the view that mind and body existed in parallel with no interaction. He argued that it was a corollary of Darwinism that only functions which were of service to the individual organism or species in the struggle for existence could undergo evolution

for any extended period. Thus, if any function was found to have undergone a long continued process of evolution and to have attained a high degree of organization in any species, it may be inferred that it aided in the struggle for existence. Consciousness was, McDougall argued, one such function:[154]

> If we accept the Darwinian Principle, we must believe that consciousness (or the production of consciousness) is a function that aids in the struggle for survival and plays some essential part in the control of the bodily processes and movements by means of which survival is achieved.[155]

The view that the mind played a role in evolution was not peculiar to McDougall. Darwin had himself taken the view that consciousness was not a mere epiphenomena of no evolutionary significance and held that it was one of the basic motors of evolutionary change.[156] Once more McDougall almost certainly drew upon the work of William James for his discussion. In his Principles of Psychology James included a chapter which argued that consciousness possessed an evolutionary utility; it was through consciousness that the nervous system was organized.[157] In Physiological Psychology McDougall argued a similar proposition:

> If mind or consciousness plays a part in guiding the evolution of the nervous system, whether in the individual or the race, it must be largely through influencing the organization of neural elements in fundamental groups or systems.[158]

Indeed by the turn of the century arguments based upon the view that mind played a role in evolution were not uncommon.[159]

As a specific example of the mind entering the evolutionary process McDougall cited the view that pleasure and pain could be shown to determine appetition and aversion. This was so he argued, because the feeling of pleasure and pain was a mental process which led to the performance of certain actions by the individual concerned. This causal efficaciousness was, he continued, incompatible with a Mechanistic philosophy. Once more its inability, as expressed in epiphenomenalism or psycho-physical

parallelism, to comprehend the organic realm was exhibited.[160]

McDougall's philosophy of nature led him to a consideration of what became a life-long preoccupation — the question of whether acquired characters were inherited. The doctrine of the inheritance of acquired characters had a long history and despite a mild reaction against this belief in the early nineteenth century, it was still prevalent at the time that Darwin's Origin appeared.[161] It is well known that Darwin never faltered in his belief that natural selection had been the principal cause of the origination of species. In spite of this Lamarckianism did play an important role in Darwin's work and he believed that the heritable effects of the environment and of use and disuse either supported or were subsidiary to natural selection. As causes of variation they were necessary and sufficient, but only natural selection would suffice as a cause of speciation.[162]

The debates over whether natural selection was sufficient to explain the process of evolution led to the polarisation of evolutionary theorists. Support for natural selection came from the 'neo-Darwinians' who believed that natural selection alone was sufficient for evolutionary development.[163] On the other hand, the widespread feeling that natural selection offered an inadequate explanation of the origin of new variations, contributed to a renaissance of a modified form of Lamarckianism. The proponents of this doctrine, the 'neo-Lamarckians', attacked the view that natural selection was the primary mechanism of evolution, asserting that Darwin and his neo-Darwinian interpreters had overemphasized its efficacy and neglected the more fundamental questions of why new variations occurred at all. Instead they insisted that only an explanation involving use inheritance could account for the latter phenomena.[164]

In the 1880s the inheritance of acquired characters became the object of sharp attack by August Weismann. This led to his often virulent exchanges with Herbert Spencer in the 1890s.[165] Although Weismann

inflicted heavy blows to neo-Lamarckianism, there is evidence to suggest that it was not laid to rest either by this or by the rediscovery of Mendel's work in 1900. In spite of his criticisms use inheritance survived. It did so partly because no theory appeared to answer all the problems of inheritance. Lamarckians were generally always able to point to inconsistencies and obscurities in rival theories of inheritance.[166] The most common note of biological comment at this time was that the Lamarckians had so far failed to prove their point of view experimentally and as Mendelian biology was shown to be capable of application to a wider and wider range of hereditary phenomena, the case against it became stronger and the failure of Lamarckians to establish their case experimentally more and more damaging.[167]

When McDougall was undertaking his undergraduate education at Cambridge the Weismann-Lamarckian controversy was in full swing and we can expect him to have been familiar with it. It is unclear, however, when exactly he became attracted to a neo-Lamarckian interpretation of evolution. He later recalled that

> In my Cambridge days I had rebelled as usual against the all-dominant neo-Darwinism or Weismannism. It seemed to me that the only ground for the dogmatic rejection of the Lamarckian theory was purely a deduction from the mechanistic dogma in biology; and I had urged that some strong scientific society should initiate and maintain...a prolonged experiment designed to settle the Lamarckian question once and for all.[168]

It was not, however, until after his emigration to the United States that both the opportunity and funds became available to conduct this experiment.

In his early published writings McDougall was rather circumspect about revealing his views on the mechanism of evolution. This is perhaps best interpreted as the reticence of an ambitious young academic to draw criticism which could endanger his career. It is in his Physiological Psychology (1905), published after his appointment as Wilde Reader at Oxford, that he first publicly toyed with the idea of use inheritance.

He argued that the view that newly acquired capacities are gradually rendered automatic over generations,

> implies...the assumption that acquired characters are in some degree transmitted from one generation to another, a proposition which most biologists at the present time are inclined to deny because they cannot conceive how such transmission can be effected. Nevertheless, the rejection of this view leaves us with insuperable difficulties when we attempt to account for the evolution of the nervous system, and there are no established facts with which it is incompatible. If, therefore, we accept this view we shall regard the congenital neural dispositions, both those that determine pure reflexes and those that determine instinctive actions, as having been acquired and consolidated under the guidance of individual experience, with the cooperation to a degree which we cannot determine, of natural selection.[169]

It is, however, in a rather more polemical context that McDougall publicly gave a greater predominance to neo-Lamarckianism. In his Body and Mind (1911) he was explicit about his reasons for rejecting neo-Darwinism. It was, he argued, a corollary of scientific materialism.[170] In his view natural selection alone was incapable of producing new traits and even if Lamarckianism were disproved then some principle other than natural selection would have to be brought into evolutionary theory.[171] He made a great deal of polemical capital out of the work of Hugo de Vries whose extensive experiments in artificial selection, directed towards the creation of new traits, had produced negative results.[172] This, McDougall argued, demonstrated that the attempt to produce new characters in the manner demanded by the neo-Darwinians had failed.[173]

McDougall supported a form of neo-Lamarckianism, arguing that new traits were produced in a Lamarckian manner with natural selection deciding only which traits survived:

> It remains open for us to believe that acquired characters are inherited in some degree, and that in this way mind has exerted teleological guidance of organic evolution, namely by determining trends of variation, which variations natural selection has accumulated and fixed as specific characters.[174]

These acquired characters were, he believed, to a large degree built up

teleologically by the efforts of the animal to satisfy its instinctive needs and to avoid the painful and secure and maintain the pleasurable influences of its environment. Such activity resulted in the formation of habits and other modifications of structure and function which were in some degree inherited in the offspring, or which determined in the offspring variations in the direction of similar modifications.[175] McDougall was attracted to Lamarckian explanations of inheritance because it could be interpreted to support the view that mind was active in the evolutionary process. Lamarckianism suggested that variation originated in an individual's reaction to its environment — in some sort of striving to adapt. It put psychological and behavioural processes at the centre of evolution.[176] In 1928 McDougall urged, in an article entitled "Was Darwin Wrong?", that

> We should go boldly back to Lamarck and assume with him that the essential factor to be investigating is the effort, the more or less intelligent striving of the organism to adapt itself to the new conditions.[177]

In addition to encompassing the physical world McDougall's evolutionary thought extended to his conception of the soul. He considered that it too evolved in a Lamarckian manner:

> If heredity is conditioned, not mechanically by the mere structure of the germ plasm, but by the teleological principle, it follows that the factors which have produced the evolution of the species must have operated on and through this principle...However the continuity of psychical constitution is maintained, it seems not improbable that the experience of each generation modifies in some degree the psychic constitution of its successors.[178]

He also entertained the possibility that at the basis of the evolutionary process of stability combined with gradual change, was "an enduring psychic existent of which the lives of individual organisms are but successive manifestations."[179] In the closing paragraphs of his Physiological Psychology McDougall rather startlingly, in a book professing to be a primer for undergraduates, posed the questions: Is the soul constant? Does it affect germ cells? Does it evolve? Does it continue

to exist after bodily death?[180] Given McDougall's commitment to a concept of the soul as a real entity which could be investigated by the methods of empirical science it is no surprise that he should consider the place of the soul in evolution.

It is evident that McDougall's concern with Lamarckianism stemmed largely from his philosophy of nature and abhorrence of Mechanistic explanations. There is, however, another source for this concern. For McDougall the question of the mechanism of evolution was no mere academic exercise; it had enormous social and political repercussions:

> in the study of animal behaviour lies our best, perhaps our only,hope of answering the question — Are acquired characters transmitted? Are the adaptions of behaviour and the consequent modifications of structure (bodily or mental) achieved by the efforts of individuals, transmitted in any degree to their progeny? This is the most urgent and practically important biological problem, perhaps the most important of all problems, a definite answer to which we may confidently hope to obtain by the methods of empirical science...So long as we have no positive answer to this question, there can be no progress made with many of the major problems of biology and of sociology, and a wise decision on some of the most far reaching legislative and administrative problems is wholly impossible. For example, the solution of the eugenic problem, the practical problem of promoting the progress of the human race, or of any section of it, or of preventing its deterioration, hangs upon the answer to this question.[181]

These statements reflect McDougall's political commitments — his commitment to a 'rationally' managed society based upon eugenic principles. McDougall's tentative attraction and eventual belief in the inheritance of acquired characters should not, however, be seen to be contradicting his eugenic beliefs. His position was close to that of another outspoken eugenicist E.W. Macbride, Professor of Zoology at Imperial College. Macbride argued that Lamarckian mechanisms were too slow to be relied upon to improve human populations, hence conscious eugenic policies were necessary.[182] Another virulent eugenicist, C.W. Saleeby, concurred with McDougall's views. In his book The Progress of Eugenics (1914) he wrote:

> the willing adaption of individuals to their conditions of life is reflected in their offspring, so that life becomes more apt and more secure in its manifestations from generation

> to generation. Here there is recognition of a positive factor which is not mechanical but psychical...we must go forward — in the illustrious company of such leaders as Bergson in Paris, Driesch in Heidelberg, and McDougall in Oxford.[183]

In view both of his political beliefs and philosophy of nature it is no surprise that for some twenty five years McDougall wanted to "Test the Hypothesis of Lamarck". The positive results of his experiments at Duke University on the learning ability of generations of rats, came too late for him to make much of it, for he died the same year in which the fourth and final report of the research appeared in the British Journal of Psychology in 1938.[184]

Chapter Seven

Notes

1. L. A. Weigle to E. D. Soper 18 June 1926, quoted (Maushopf, McVaugh: 1980, 133). The letter was occasioned by the attempt of W.P. Few (President of Duke University) to find out about McDougall's status within psychology before offering him the Professorship at Duke University.

2. F.C.S. Schiller to William James, 25 November 1903, quoted (Soffer: 1978, 219).

3. "Step by step, in successive departments of fact, conflicting modes of thought have receded and faded, until at length they have vanished everywhere, except for the mysterious citadel of the will."
Henry Sidgwick Methods of Ethics (1874), quoted (Daston: 1978, 194).

4. (McDougall: 1897; 1898a). He recorded that he spent each long vacation of his time at Cambridge attempting to find experimental support for his theory of muscular contraction; he also undertook research in the physiological laboratory at St. Thomas's Hospital (McDougall: 1897, 410; 1930, 199-200). McDougall's first published paper was jointly authored with W.B. Hardy and concerned the alimentary canal of the fruit fly (McDougall, Hardy: 1895).

5. (McDougall: 1930, 200).

6. (Riese: 1959, 73-117).

7. (Young: 1970).

8. (McDougall: 1911, 104-05).

9. (Brazier: 1959, esp. 25-40), (Fearing: (1930) 1970, Chap.8-11), (Liddell: 1960, Chap.3). See also the account in (Jacyna: 1981).

10. (McDougall: 1905, 7,15).

11. (McDougall: 1911,225).

12. (McDougall: 1898b, 365).

13. "I read Wundt's books and found them very dusty. I read also Külpe, Ziehen, Münsterberg, Höffding, Bain, Hobhouse, Lloyd Morgan, Ward, Stout and Lotze. Of all these authors Stout and Lotze seemed to yield more nutrient than the others. Among all the German philosophical writers I had sampled, Lotze was the only one who stirred me to something like enthusiasm." (McDougall: 1930, 203). Lotze is quoted at length throughout McDougall's book Body and Mind and is included in the list of further reading at the end of his Physiological Psychology. Regarding Lotze see (Lindsay: 1876).

14. Lotze was quoted on this point by McDougall, see (McDougall: 1901a, 628; 1911, 225-26).

15. (Swazey: 1969, esp. 75), (Black: 1981), (French: 1970).

16. (McDougall: 1901a).

17. See especially Ibid, 626.

18. (McDougall: 1905, 59).

19. Ibid, 79. The foregoing account was based upon McDougall's Physiological Psychology. He also discussed the topic thoroughly in Body and Mind.

20. (McDougall: 1901a, 629).

21. Ibid, 629. (McDougall: 1911, 293-97).

22. (McDougall: 1901a).

23. (McDougall: 1901b; 1902; 1903a,b; 1904a,b; 1906; 1908b; 1910b).

24. (McDougall: 1901a, 614).

25. Ibid, 625.

26. (McDougall: 1911, 279).

27. (McDougall: 1901a, 617).

28. See (Smith: 1982a).

29. (James: 1890, Vol.1, 71).

30. (McDougall: 1903b, 170). A hypothesis similar to McDougall's was also put forward by F.W. Mott in 1902. Mott argued that currents of 'nervous energy' continually flowed in the nervous system; these flowed with the greatest readiness along neural systems which had become functionally correlated by habit and use; more 'potential' of nervous energy had to be used up when new pathways are opened up by the operation of Attention (Mott: 1902). It is unlikely that McDougall owed an intellectual debt to Mott since his first paper on the subject pre-dates Mott's. Indeed he was groping his way towards his theory as early as 1898, see (McDougall: 1898b, 168, 367, 381).

31. It is unclear how closely McDougall and Sherrington worked. McDougall first met Sherrington at St. Thomas's Hospital in 1895 where the latter worked before taking up the Holt Chair of Physiology at Liverpool. In his paper on muscular contraction of 1897 McDougall stated: "I wish to thank Prof. C.S. Sherrington for advice and encouragement on my first taking up this investigation." (McDougall: 1897, 583). Both would also have met regularly at meetings of the British Psychological Society and the Neurological Society. For discussions of Sherrington's work see (Eccles, Gibson: 1979), (Granit: 1966), (Liddell: 1960, Chap.4), (Swazey: 1969).

32. (McDougall: 1901a). For an extensive discussion of Sherrington's studies see (Swazey: 1969). His work was later republished in his Integrative Action of the Nervous System (1906). In an extended review of Sherrington's book McDougall wrote praisingly of its importance. The only fault he found was that in some ways it did not go far enough and that Sherrington's work needed to be supplemented by his own, and demonstrated how their work was closely linked (McDougall: 1907b).

33. (Brazier: 1959, 25-40), (Fearing: (1930) 1970, Chap.12), (Liddell: 1960, Chap.6), (Swazey: 1969).

34. (Sherrington: 1906, 192).

35. The other main contenders were the 'Interference', 'metabolic', 'refractory phase' and 'chemical' theories (Fearing: (1930) 1970, Chap.12). Sherrington devoted space to explanations of inhibition in his Integrative Action, this included McDougall's account (Sherrington: 1906, 192-98).

36. (McDougall: 1903b). The theory also received extensive discussion in his Physiological Psychology.

37. Ibid, 169, (emphasis in original).

38. (Sherrington: 1906, 83-113), (Swazey: 1969, Chap.5).

39. (McDougall: 1903b, 172). William James also applied his version of a drainage theory to explain inhibition, arguing that it involved competition for 'nerve currents' and the 'drainage' of one cell by another (James: 1890, Vol.2, 373).

40. Ibid, 178ff. (McDougall: 1905, Chap.5).

41. (Sherrington: 1906, 105, 192).

42. For an interesting discussion of this theme see (Smith: 1980).

43. See (Lasseck: 1970), (Magoun: 1960), (Oldfield: 1963), (Walshe: 1961). Jackson's theory was heavily dependent on Spencer's Principles of Psychology, see (Smith: 1982b).

44. See (Rivers, Head: 1908), (Langham: 1981, Chap.2), (Miller: 1972), (Slobodin: 1978, 31-35). Rivers and Head concluded their report of the experiment:

> "We believe that the essential elements exposed by our analysis owe their origin to the developmental history of the nervous system. They reveal the means by which an imperfect organism has struggled towards improved functions and psychical unity."

Ibid, 449.

45. (McDougall: 1898b, 165-70; 1905, Chap.1).

46. (McDougall: 1898b, 380).

47. (McDougall: 1903b, 173; 1905, 103). The observed loss of function in the reverse order (i.e. highest level first) under the influence of drugs or disease formed one strand of the evidence which McDougall presented in support of his theory. The other observations were the comparison of the brains of vertebrates of different levels of development, and the order of development of the human brain. (McDougall: 1905, 23-24).

48. (Slobodin: 1978, 18).

49. See (Rivers: 1908).

50. (McDougall: 1903b, 171-72; 1905, 104-166).

51. (McDougall: 1905, 165).

52. Ibid, 154-55.

53. Ibid, 164-66.

54. (McDougall: 1932, 10).

55. (Fletcher: 1968, xi), (Lorenz: (1937) 1957, 156-63).

56. (Cravens: 1978, Chap.6),(Krantz Allen: 1967).

57. For the history of instinct theories see (Diamond: 1973), (Fletcher: 1968), (Richards: 1978), (Wilm: 1925).

58. (Darwin: (1859) 1968, 458).

59. See for example (Wallace: 1864). It has recently been argued that Darwin's silence was due in part to his fear of a hostile reception, see (Durant: 1977, Chap.4), (Gruber: 1974).

60. (Young: 1973b, 183-84). For general outlines of Darwin and psychology see (Gruber: 1974; 1980), (Ghiselin: 1973), (Sulloway: 1979, 238-57). For Darwin's impact on psychology see (Hilgard: 1960).

61. (Darwin: 1871, 105).

62. See (Durant: 1977, 147-56).

63. (Darwin: (1859) 1968, 235-36; 1871, 67).

64. For a thorough discussion see (Richards: 1978).

65. In fact Mental Evolution in Animals included as an appendix "A Posthumous Essay on Instinct by C. Darwin" (Romanes: 1883a, 355-84).

66. (Moore: 1979, 187-90), (Richards: 1977, 16-18).

67. (Romanes: 1883a, 177-78). The term 'lapsed intelligence' appears to have been first used by G.H. Lewes (Wilm: 1925, 154).

68. (Richards: 1977,16).

69. See (Richards: 1977) for an account of his work.

70. (McDougall: 1908a, 14).

71. (McDougall: 1905, 1).

72. Ibid, 107.

73. (McDougall: 1908a, 10).

74. Ibid, 22-23.

75. Ibid, 19.

76. Ibid, 24.

77. These pairs were: Flight and Fear, Repulsion and Disgust, Curiosity and Wonder, Pugnacity and Anger, Self-Abasement and Subjection, Self Assertion and Elation, the Parental Instinct and Tenderness.

78. These were Reproduction, Gregariousness, Acquisition and Construction.

79. The foregoing account is based on (McDougall: 1908a, 45-89).

80. Ibid, 90-120.

81. (McDougall: 1898b, 168-69).

82. (McDougall: 1908a, 25-26).

83. (McDougall: 1905, 105-06). McDougall used the view that experience modified the nervous system to differentiate between humans and other animals: only the former learn by experience, only their nervous system is modified by experience.

84. Ibid, 107.

85. Ibid, 109-1 .

86. (McDougall: 1908a, 29). That this book builds upon work which McDougall had been pursuing since the turn of the century has gone unnoticed in other accounts of McDougall's work. This is perhaps due to McDougall's claim in his autobiography that he came upon the idea of instinct in 1906 (McDougall: 1930, 208). See (Drever: 1968), (Soffer: 1978, 219).

87. (Spencer: 1870, Vol.1, 422, 432, 454). On Spencer see (Young: 1970, 172-80), (Richards: 1978, 161).

88. (Romanes: 1883a, 160), emphasis in original.

89. For an excellent account of James' psychology and its relation to Darwinism see (Wiener: 1949, 97-128). See also (Soffer: 1978, 135-61).

90. (James: 1890, Vol.2, 383-441); for a discussion of James' instinct theory see (Fletcher: 1968, 30-34).

91. (James: 1890, Vol.2, 384).

92. Ibid, 390-91.

93. James discusses human instincts in Ibid, 403-41.

94. Ibid, 408-10, 415, 422, 439.

95. Ibid, 442-485.

96. See for example (Stout: 1891; 1899, 56-70).

97. (McDougall: 1908a, 33-34).

98. (McDougall: 1908a, Chap.2; 1910a, 252; 1911, Chap.11).

99. (McDougall: 1908a, 25).

100. Ibid, 26.

101. (McDougall: 1910a, 258).

102. (McDougall: 1908a, 27).

103. See for example (McDougall: 1924). For a thorough philosophical discussion of McDougall and purpose see (Boden: 1972, Chap.2).

104. (James: 1890, 442-85). McDougall did the same in his Physiological Psychology.

105. Ibid, 449 (emphasis in original).

106. (McDougall: 1905, 112-15).

107. Ibid, 115.

108. Ibid, 116.

109. Ibid, 108-09.

110. The papers read at the meeting were reprinted in the British Journal of Psychology, Vol.3 (1909-10).

111. Carr was a businessman who became Professor of Philosophy at Kings College London in 1918. He was a supporter of sorts of the vitalist philosophy of Henri Bergson (Carr: 1910), (Soffer: 1978, 158-59).

112. (Richards: 1977, 13-14).

113. (Lloyd Morgan: 1896, 27-28).

114. (Lloyd Morgan: 1910b, 226-27), see also (Richards: 1977, 22-25).

115. Ibid, 228.

116. (Richards: 1977, 19-22).

117. (Lloyd Morgan: 1910a, 6).

118. Ibid, 18.

119. (McDougall: 1910a, 258).

120. Two years later Lloyd Morgan devoted a chapter of his book Instinct and Experience (1912) to McDougall's work and restated his belief that evolution and behaviour were in no way connected with an immaterial soul (Lloyd Morgan: 1912, Chap.8). Another contributor to the 1910 symposium, G.F.Stout, professed a doctrine of psycho-physical parallelism and argued that instinctive behaviour was based on a train of physical reflexes under the extrinsic control of the mind (Stout: 1910).

121. (McDougall: 1908a, 10).

122. Ibid, Chap.5, 6.

123. For biographical details see (Stout: 1936).

124. (Shand: 1896), see also (Leary: 1982, 157-61).

125. (Shand: 1914).

126. (Stout: 1901, Book 4, Chap.9; 1903, Chap.16).

127. (McDougall: 1908a, Chap.5). In the first edition of Introduction to Social Psychology McDougall wrote as if he was simply following Shand's theories. After the publication of Shand's book, however, he felt obliged to distinguish between their two accounts in the Preface to the fourteenth edition of his book, published 1919.

128. (McDougall: 1908a, 160).

129. Ibid, Chap.7.

130. Ibid, Chap. 8, 9.

131. (McDougall: 1912b, 91). Thus, the view that McDougall never solved the problem of how instinctively motivated human beings achieved a rational society is unfounded, for this view see (Soffer: 1978, 240).

132. (McDougall: 1908a, Chap.11).

133. (Darwin: 1871), Greg:(1868), (Bagehot: 1969), (Galton: 1865), (Wallace: 1864). See (Driver: (1933), 1967) for a discussion of some of this work. There was also an important tradition which owed nothing to Spencer or Darwin, this included the work of Henry Maine and E.B. Tylor, see (Burrow: 1966).

134. On Tylor's social evolutionism see especially (Stocking: 1968b). Darwin's work was itself unoriginal, drawing for ideas of social evolution on Greg, Galton, Wallace and others (Durant: 1977, Chap.4), (Greene: 1977).

135. For accounts of Kidd's work see (Collini: 1979, 176-77), (Mackintosh: 1899, 238-55), (Semmel: 1960, 31-35). Kidd's book Social Evolution went through nineteen printings in four years.

136. For an account see (Jones: 1980, 122-27).

137. On Pearson see (Eisenhardt: 1974), (Mackenzie: 1981, Chap.4), (Norton: 1978).

138. Since in the present discussion my aim has been to relate McDougall's instinct theory with his Animism and mind-body interactionism a fuller account of his theory of instincts, socio-political views and their wider context would be out of place.

139. (McDougall: 1930, 194).

140. Ibid, 195.

141. (Spencer: 1870, Vol.1, 291). For a general account of Spencer's psychology see (Smith: 1982a).

142. (Darwin: 1871); see also (Durant: 1977, Chap.4), (Gruber: 1980), (Moore: 1979, 155-61).

143. (Young: 1973b, 184).

144. (Darwin: (1859) 6th edition 1872, 668).

145. (Huxley: (1874) 1893).

146. (Romanes: 1883a, 8); on Romanes see (Moore: 1979, Chap.7).

147. (Smith: 1978).

148. Panpsychism appears to have had very little support, although W.K. Clifford professed a version of this philosophy (Clifford: (1874) 1879, Vol.2, 31-70).

149. (McDougall: 1898b, 27-28).

150. For an account see (Hearnshaw: 1966). Indeed, McDougall's early writings on the subject certainly owe a great deal to Hobhouse's Mind in Evolution (1901). In 1920 McDougall dedicated his book The Group Mind to Hobhouse.

151. (McDougall: 1911, 119-21).

152. Ibid, 233.

153. For a summary of McDougall's view of the evolution of mind see (McDougall: 1925). It should be noted that the view that mental attributes had evolved in a similar manner to physical ones was not held by every proponent of evolutionary theory in the late nineteenth century. For example, Alfred Russel Wallace maintained that the physical characteristics of humans had evolved before mental ones and that the advent of mind was a new stage in evolution, thereby implying that the mind itself had not necessarily evolved; for an excellent discussion see (Smith: 1972).

154. (McDougall: 1898b, 27; 1911, 272-75).

155. (McDougall: 1911, 272-73).

156. (Smith: 1978, 261). Alfred Russel Wallace, however, maintained a position closer in some respects to McDougall's. He believed that there was a spiritual purpose behind the phenomenon of consciousness and it was not clear to him that conscious actions could have any biological utility if they were merely parallel or epiphenomenal to automatic physiological actions (Smith: 1972, 183).

157. (James: 1890, Vol.1, 138-44).

158. (McDougall: 1905, 59).

159. See for example (Bradley: 1895).

160. (McDougall: 1905, 165-66).

161. (Zirkle: 1946), (Stocking: 1968a, 234-69).

162. See for example (Moore: 1979, 140-42).

163. See Ibid, Chap.8 for an excellent discussion.

164. The literature dealing with neo-Lamarckianism is rather small, see (Fothergill: 1952, 160-66), (Kellog: 1907), (Moore: 1979, 140-52), (Pfeifer: 1965), (Stocking: 1968a, 234-69). As Moore points out it is important to recognize that neither neo-Darwinsim nor neo-Lamarckianism were monolithic bodies of thought.

165. Spencer's view of evolution was, of course, avowedly Lamarckian and he believed that natural selection was an inadequate cause of evolution. For Spencer's Lamarckianism see (Peel: 1971, Chap.6), (Young: 1970, Chap.5); for an account of the controversy see (Churchill: 1978).

166. (Jones: 1980, 87).

167. (Stocking: 1968a, 254). It should be noted, however, that Stocking's observations are primarily based on United States sources and that the situation may have been different in Britain. This area has been little explored, but at least one prominent biologist, Lloyd Morgan, moved from a tentative acceptance of the inheritance of

acquired characters to a neo-Darwinism because of the lack of convincing evidence to explain the mechanism of use inheritance, see (Richards: 1977).

168. (McDougall: 1930, 213), cf. "When I was an undergraduate at Cambridge, Neo-Darwinism was coming into fashion, and I accepted it somewhat superficially. But I was not satisfied. It seemed to me that the rejection of the Lamarckian theory was in the main a corollary of scientific materialism."(McDougall: 1934, viii).

169. (McDougall: 1905, 156).

170. (McDougall: 1911, 234).

171. Ibid, 248.

172. Here he cited de Vrie's Plant Breeding (1907).

173. (McDougall: 1911, 249).

174. Ibid, 247-48.

175. Ibid, 246.

176. (Jones: 1980, 87-88).

177. (McDougall: (1928) 1934, 174).

178. (McDougall: 1911, 377-78).

179. Ibid, 377.

180. (McDougall: 1905, 169).

181. (McDougall: 1912a, 177-78).

182. See (Macbride: 1924).

183. quoted (Jones: 1980, 94).

184. (McDougall: 1927b; 1930b; 1938), (McDougall, Rhine: 1923).

CHAPTER 8

CONCLUSION

When we seek to know the facts, the questions which we ask, and therefore the answers we obtain, are prompted by our system of values...values enter into the facts and are an essential part of them. Our values are an essential part of our equipment as human beings.

E. H. Carr What is History?
(Penguin: Harmondsworth, (1964) 1978),P131.

In his Presidential Address to the British Association for the Advancement of Science in 1977 Professor Sir Andrew Huxley, grandson of T. H. Huxley, set out to defend science from those whom he considered were seeking to attack its independence. He reasserted the familiar position, long extolled by scientists and philosophers alike, that scientific knowledge and research are divorced from social and political questions. At the core of his argument was the view that fact and value were and must be kept separate.[1] The basic position which has been taken in the present work stands in direct contrast to that of Huxley and other modern day apologists for the 'independence' and 'neutrality' of science. One of my concerns has been to argue, although with what success I leave others to judge, that scientific knowledge cannot be understood apart from the social context in which it is produced; that it is subject to a variety of kinds of determination in different ways and at different levels. There is no dividing line between 'science' and 'context' or fact and value — the facts are partly constructed through our values.

I have argued that late nineteenth century psychologists adopted certain working assumptions about the mind. That these assumptions existed is no more than a particular case of how all knowledge is constituted. It is through such assumptions that one path lies by which our values are projected onto nature. There are, however, a number of ways and levels in which knowledge is constituted in society, although in this work I have generally focussed on only one such means.[2] Although I would argue that all scientific knowledge can be analysed in some way or another as being subject to some form of social determination, it could perhaps be conceded that in psychology and the other human sciences the framework of assumptions by which knowledge is constituted are more on the surface and can be 'read' with greater ease. My general approach has been to argue that the study of the mind has involved, and indeed must necessarily involve, the

psychologist beginning with an image of human nature which to a great extent determines how the phenomena of mind will be treated and analysed. Given this perspective one can then go on to consider the assumptions and values embodied in this 'image'.

The approach I have taken is illustrated in the way in which the idea of 'mental ability' was constituted in Victorian Britain. Today the idea that people differ in the amount of a quantity called mental or intellectual ability seems, to many people at least, to be 'natural'. It is a belief not only seemingly confirmed by the results of intelligence tests but also by the simple observation of the structure of society and the people within that structure. This 'naturalness' of the belief obscures the fact that the way in which people are graded on intelligence tests and arrayed on an ordinal scale of intellectual ability is based upon particular presuppositions. I have tried to elucidate how this particular tradition of describing human nature began.

In the early nineteenth century the phrenological literature was predicated on the assumption that people differed in their mental attributes. It was argued that mental make up, character and ability were situated in particular physical structures. The size of brain determined the overall 'mental power'; the size of its parts, the particular abilities or character traits which an individual possessed. As a science of character phrenology was inherently meritocratic and could be used to legitimate the existing class structure and division of labour. It was through phrenology that the psychologist Alexander Bain gained his initial conceptions of mental ability. Bain took some of the general ideas prevalent in the phrenological literature and moulded them onto his particular rendition of the Association psychology. This enabled him to suggest means by which mental ability could be measured. Bain's account of mental differences formed part of his broader meritocratic philosophy.

He adhered to many of the ideals of J. S. Mill and other Liberal reformers. He believed, for example, that society had to be reorganized such that merit and not privilege determined a person's standing and role in society. These commitments to a meritocracy were intertwined with Bain's perceptions of Victorian society. He employed his ideas about mental ability and mental differences to account for the existing division of labour; at the same time this division of labour appeared to lend credence to his ideas. Bain believed that to a certain extent people occupied the positions they did by means of their superior or inferior mental abilities. In part his theories rendered the existing division of labour 'natural'. Bain's account of human nature in terms of 'mental ability' was thus partly the product of particular social and political perceptions.

It is clear that even before Francis Galton began to consider individual differences in mental ability in the 1860s a particular tradition of viewing human nature in terms of the possession of mental ability already existed. It has often been said that Galton's writings on mental ability formed the starting point for modern accounts of intelligence. The nature of this 'legacy' has, however, remained unexplicated. I have argued that Galton's contribution was the forging of a tradition of viewing human nature in a particular way. Galton's mental tests were no 'mere' technical development; they embodied a particular approach to the mind and were a development of the tradition tentatively begun by Bain. There were several determinants of Galton's work on mental ability and several pools of knowledge he employed. At a basic level Galton's work was solidly within that approach to nature which has been termed 'scientific naturalism'; he firmly believed that the universe could be described without recourse to 'spirit' or 'God'. One of the main reasons why Galton undertook his studies of mental ability can be found in his commitment to a society organized along meritocratic lines and according to eugenic principles. This can itself be viewed as flowing from his professional middle class

background and concerns. In developing his mental tests Galton drew to a certain extent on the earlier work of Bain. This 'influence' lay in part in Bain's view of mental ability and mental differences, and more particularly his linking of sensory discrimination and ability. Galton also employed some of the wider developments in experimental psychology as a resource in his work in mental ability. This experimental work, largely emanating from Germany, provided a fertile source which Galton took up and refashioned within the terms of his own approach to human nature and the mind. A further aspect of Galton's initial concern with grading human beings according to their mental ability lay in his interest in ethnology and his experiences while travelling in Africa. These taught him that people varied widely in their intellectual powers. Further, the prevailing view within anthropological thought was that such differences were due to heredity. It was only a short step for Galton and others to pass from inequalities between races to assert the inherited inequality of mental powers within a race. Finally, one cannot abstract Galton's views of mental ability from his wider concern with physical ability and 'fitness'. The period of the 1870s and 1880s when Galton was working out his ideas on mental ability was also one in which there was a widespread concern about the physical state of the population. This concern engendered extensive investigations, particularly by the British Association Anthropometric Committee. Galton was one of the key figures in this wave of interest. His work at this time formed part of the one project: to investigate the 'fitness' — physical and mental — of the population. Galton's work was taken up and developed by a number of other people, most of them acting under his patronage. Eventually, the 'Galtonian tradition' of conceptualising human nature was carried forward into the work of Spearman and Burt, and the testing programmes in the United States. My discussion of the work of Joseph Jacobs provides a good illustration of the social use of Galton's ideas on physical and mental ability. This case study demonstrates

that they could be pressed into service within a variety of political programmes. In Jacobs' work they were used to defend Jews and Jewish immigrants from anti-Semitic persecution.

It is clear that at its core the development of a psychology of individual differences in mental ability involved an assumption that the mind could be measured and that people could be arranged in a hierarchical order according to whether they possessed more or less of a 'thing' called intellectual ability. The work of Bain and Galton was important in that it played a key role in forging twentieth century views on mental ability. Their work was not in some way 'value free' but the result of a complex unity of social determination, existing knowledge and practices and 'feed-back' from 'reality'. Thus, I would argue that the recent furore over Cyril Burt's falsification of data, and other misdemeanours, is really a distraction from the path of understanding the development of modern intelligence testing. His particular wrongdoings are neither here nor there.[3] Similarly, approaches to intelligence testing based upon the view that such knowledge is 'ideological' rather than 'scientific' are misplaced.[4] This perspective is based upon the view that 'ideology' is a distortion of reality. I would argue that on the contrary ideology is a representation of reality, that no distinction can be made between 'science' and 'ideology'. This follows from the view that there can be no direct unmediated access to the natural world.[5]

Another of my main themes, that of views of the relation of mind and body and the consequences of such views, provides a further account of the social constitution of psychological knowledge. My discussion of the work of William McDougall demonstrates how the form and content of scientific knowledge can be socially constituted through the intermediacy of a particular philosophy of nature. I have argued that McDougall's psychological writings were structured by his commitment to a form of vitalism and a view that mind and body interacted. His extensive

contributions to physiological psychology, to behavioural psychology and to evolutionary theory were all in one way or another built upon the premise of his philosophy of nature. There were thus an array of presuppositions from which McDougall's scientific work flowed. One quite simply cannot separate out those aspects of McDougall's thought 'outside' and 'inside' science. McDougall's philosophy of nature was itself subject to social determination. It was not a 'mere' philosophical commitment; it was personally, socially and politically generated and sustained. His reaction against scientific naturalism was in part the result of his felt need to have some replacement for a belief in God, a need for some means of ordering the cosmos. At the same time he saw a belief in the world of spirit as being of immense moral and political significance. Such a belief was, he believed, essential to the maintenance of an orderly society; without such a belief chaos would result and immorality rule. Such views were by no means idiosyncratic; a number of academics, social commentators and others voiced similar views about the need for a belief in some sort of spiritual side to nature.

My account of the main aspects of McDougall's early scientific work emphasizes the complex way in which knowledge is produced. We can consider three aspects of this process. First, McDougall used existing knowledge and theories as a resource to be employed in his own work. Thus, he drew heavily on aspects of the work of William James and C.S. Sherrington. He did not, however, merely reproduce their ideas; they were reinterpreted within the terms of his own theoretical allegiances. Secondly, his philosophy of nature — animism and interactionism — provided the general approach which he took to physiological and psychological issues. These commitments also led him to pursue a research programme in order to provide evidence for the existence of a soul and mind-body interaction. Thirdly, McDougall did not somehow construct his accounts apart from 'reality', they were not mere social constructions. His work was to a large extent

based upon numerous experiments and as such his theories were subject to feedback from the external world.

What overall conclusions can be drawn from these accounts? I would argue for the importance of treating the production of knowledge in the way in which I have done in this work. The existence of a basic philosophy or approach to the phenomena being investigated provides a link between social context and 'reality'. It is through a philosophy of nature that accounts of the natural world can often be profitably viewed as being subject to social determination. I do not claim that such an approach would be fruitful in every case studied. For one thing, a person's or a social group's philosophy of nature is not always particularly relevant - for example one may wish to undertake an institutional analysis where the approach which I have taken might not be appropriate, or a philosophy of nature might be widely institutionalized and exist apart from immediate social concerns. My overall perspective has been to argue that people produce knowledge against the background of a pool of existing knowledge which can be drawn upon as a resource; that their intentions and social situation play a fundamental role; that new knowledge is developed in a process of interaction with 'reality'. These points serve to underline that there is no contradiction between the treatment of knowledge as a social phenomena and an 'internalist' account: both recognise the importance of existing knowledge and feedback from 'reality'. I do not claim that the general approach I have taken is radically new, it is one which has steadily been gaining support over the last few years.[6]

One objection which could be raised to the accounts presented in this thesis is that I have neglected to relate the activities and ideas of individual theorists to the social positions occupied by them. Several recent accounts in the social study of science have been explicitly based upon such a perspective. These have argued at length and with considerable force, that the form and content of scientific knowledge can be fruitfully

viewed as being linked with the 'social interests' of the theorists involved.[7] In a particularly prominent and detailed account based upon this perspective, Donald Mackenzie has argued that particular features of statistical theory in late nineteenth and early twentieth century Britain can be understood in the light of the 'social interests' of those involved. For example, in the case of Karl Pearson, Mackenzie argues that his work expressed the interests of the emerging professional middle class. His analysis is a structural one which begins with a theory of social structure, locates certain positions in that structure, posits 'social interests' associated with that structure and argues that the operation of these interests, if unopposed, would lead to tendencies to particular patterns of evaluation of existing knowledge and construction of new knowledge.[8] It is, however, important to note that the proponents of this approach are careful to stress that their analysis is based upon a particular theoretical position which is itself open to criticism and investigation.[9]

Although this type of analysis has not featured explicitly to any great extent in the accounts which I have presented above, I have found it to be very stimulating and insightful. There do, however, seem to me to be two problems with such an approach. One problem lies in the question of how we should treat ideas which are not unique to one particular social group, since if this is the case it is difficult to see how to account for their existence by reference to particular social interests. For example, I really do not see how an account could be rendered of the writings and thought of William McDougall in terms of his particular social interests. On the one hand his philosophy of nature was espoused by a number of people across a wide range of social positions and political allegiances. On the other hand, people of the same social position as McDougall held views of the natural world which were in direct opposition to his. It may well be, however, that this example suggests that further elaboration of the 'social interests' approach is necessary rather than

it is in some way misconceived.

A second problem relates to the relation between an individual and a structural analysis of knowledge. Mackenzie, Barnes and others are surely correct in pointing to and investigating the relation between knowledge and social position. One problem, however, is how an individual's thought or belief relates to his or her social position. It is all very well to argue that one is pursuing a structural analysis, but we do not just want such an account. Historians also want to ask why particular theorists rendered particular accounts. Mackenzie is aware of this point and notes that although in the case of Karl Pearson there does seem to be an instance of a match of ideas and social position, explaining why this match came about and why Pearson should have manifested it is beyond the present capacity of the sociology of knowledge. Indeed, he says that it might not be a sociological problem at all.[10] It seems to me, however, that a gap in the argument does exist: how individual 'motive', 'intent' or 'action' relates to a structural analysis. It is really a question of how the historiography of individual 'motive' relates to the historiography of social groups and the knowledge they produce. I am not suggesting that the 'social interests' approach should be rejected, rather that further elaboration, clarification and investigation is necessary.[11]

A further issue which needs to be considered is the question of what light the studies in this thesis throw upon the history of psychology and of British psychology in particular. In contrast to a considerable amount of material in the history of psychology written by working scientists for their colleagues and students, and which tends to reflect problems and questions of current interest, I have sought to take a rather more historically sensitive and contextual approach. While there are signs that this view is at last gaining ground, the process needs to go much further. No more general surveys of the history of psychology are really necessary; what are needed are books and articles of definite scope and

intent that are concerned with important figures, the historical development of concepts, or the relation of psychology to its wider social and cultural context. The history of British psychology in particular has tended to be lacking in such detailed accounts. Hopefully, the present studies will help a little to alter this picture.

There are several points of general interest and importance with regard to the history of British psychology which have emerged from the present work. First, in recent years, particularly after 1979 — the 'centenary year' of the 'founding' of experimental psychology — great concern has been shown by historians of psychology in the United States about the 'origins' of experimental psychology. This has tended to concentrate on the development of the subject in Germany and its transfer to the U.S. Broader questions of whether one can talk of an origin have tended to be pushed to one side.[12] One point which I think can be drawn out from the present work is that it is misleading to talk of one 'origin', the character of experimental psychology and the nature of its development has differed in different social and cultural settings. Thus, one can situate the different rate of development of the discipline in the particular institutional and cultural settings of the U.S., Germany and Britain. One can also see that different concerns existed in the discipline in these various settings. For example, the existence of a concern with individual differences in mental ability in Britain but not in Germany could be explained in this manner.

Another point which can be adduced from the account given here is the nature of the psychological enterprise in Victorian Britain. New disciplines can be said to exist on the basis of the presence of certain social characteristics. These include an institutional base, the existence of facilities for training new recruits, technical expertise, and a well defined area of knowledge claims and autonomy from other fields of investigation. I hope that the accounts which I have given here have

thrown some light on the process of the establishment of the discipline of experimental psychology in Britain. This is an area which has, I believe, been undocumented previously. I have argued that the establishment of experimental psychology in Britain was a long and faltering process. From about the 1870s onwards a variety of formal and informal societies came into existence through which those interested in psychology could meet. At the same time several journals appeared in which psychological papers could be published. However, the establishment of a specialist society and journal did not occur until after the turn of the century. This followed after experimental psychology had gained a foothold in the universities. The development of experimental psychology as a separate discipline did not come about by some kind of automatic process simply by the differentiation of knowledge. Its individual identity was forged by the efforts and activities of a number of people, over a considerable period of time in a variety of contexts and settings.

A great deal of further research is necessary in the history of British psychology. It might be said that one of the weaknesses of this thesis is that I have swept my gaze across a broad area and have not concentrated on one theme. This approach is justified, I would argue, by the lack of existing accounts of British psychology in the late nineteenth and early twentieth centuries. The accounts which I have given here do, however, suggest several possible areas of further research. First, it is evident that a detailed study of the fate of scientific naturalism towards the close of the nineteenth century is sorely lacking. A considerable body of published work now exists which deals with the 1860s, 1870s and 1880s, but the period from then until the First World War has been almost neglected. Another area which merits further research is the growth of experimental psychology in Britain. Several points come to mind: the growth of an experimental tradition; the switch from associationism to an active, holistic view of the mind; the important work of James

Ward, James Sully and G.F. Stout. Three further areas of future research are suggested by my account of McDougall's work. Most importantly, perhaps, is the fact that a full account of McDougall's life and work is sorely lacking given his status in early twentieth century British psychology. Further work is also necessary on the broader picture of the development of theories of instinctive behaviour and of behavioural and social psychology. Another topic of interest arising from my account of William McDougall's work is the extent of support for Lamarckianism in Britain in the first decades of this century. One final area deserving further study is the post nineteen hundred development of views about mental ability and of mental tests. In particular, the taking up in Britain of Binet type tests rather than Galton's sensory ones is an important and neglected subject.

In one of his discussions of mental ability Francis Galton wrote of the possibility of obtaining a general knowledge of the intellectual capacities of people 'by sinking shafts, as it were, at a few critical points'. The path followed in the present work has been to illuminate the development of experimental psychology as a whole in Victorian Britain by 'sinking shafts' at certain points. It is to be hoped that this may serve as the basis for other studies in order to build up a coherent picture of the strata in which these shafts have been sunk.

Chapter 8.

Notes

1. (Huxley: 1977). For a critique of Huxley's address see (Young: 1977b).

2. For a survey of the types of studies already undertaken see (Shapin: 1982).

3. On the 'Burt affair' see (Beloff (ed): 1980), (Dorfman: 1978), (Evans, Waites: 1981), (Eysenck: 1977, 1982), (Gillie: 1976; 1978; 1980), (Gould: 1981), (Hearnshaw: 1979b; 1980), (Thoday: 1981).

4. See for example (Rose, S. : 1976), (Rose, H. & S.: 1978).

5. In the present study I have not found the category of ideology particularly useful, but see (Barnes: 1977, Chap.2), (Larrain: 1979), (Lichtheim: 1965), (Williams: 1977).

6. See for example (Barnes: 1974; 1977), (Bloor: 1976), (Shapin: 1982).

7. See for example (Jacyna: 1982), (Mackenzie: 1981a).

8. (Mackenzie: 1981a, esp. Chap.4).

9. See for example (Barnes: 1981, 490, 492). This approach has been the subject of a rather unfruitful debate recently, see (Barnes: 1981), (Callon, Law: 1982), (Mackenzie: 1981c), (Woolgar: 1981a, b).

10. (Mackenzie: 1979, 141-42).

11. Mackenzie explicitly recognizes the need for further investigation, see (Mackenzie: 1981c, 499, 503).

12. (Smith: 1982).

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   a. Papers and Correspondence of Sir Francis Galton ('Galton Collection'). The Galton papers were extensively used in the present study. They form a rich, although patchy, resource for the historian of late nineteenth century psychology, biology and scientific community. It would be pointless to reiterate the items found to be of particular value; these are referred to fully above. A catalogue of the collection is available, see M. Merrington and J. Golden A List of the Papers and Correspondence of Sir Francis Galton (1822-1911) (University College: London, 1978).

   b. Papers and Correspondence of Karl Pearson ('Pearson Collection'). There was very little material of interest in Pearson's papers, the main items being some correspondence abstracted by Pearson from Galton's papers while he was writing a biography of the latter. A complete listing is available, see M. Merrington, B. Blundell, S. Burrough, J. Golden, J. Hogarth A List of the Papers and Correspondence of Karl Pearson (1857-1936) (University College: London, 1983).

   c. Bound volumes of the University College Calendar and University College Council Minutes.

2. In the care of the British Psychological Society.

   a. British Psychological Society Minute Books. Unfortunately this material was found to be of little value, due primarily to its rather brief nature.

   b. Papers of Charles Spearman. This material contained no items relevant to the present study; most of the collection dates from the 1930s.

All of the manuscript material formerly in the care of the British Psychological Society has now been deposited at the University of Liverpool. Additional material which would have been of value to the present study has now been added to the collection. This includes a collection of material on the Child Study Society (1897-1914). For an outline of the entire collection see S. Lovie and Anne Moore "The British Psychological Society's Archives at Liverpool", Bulletin of the British Psychological Society, Vol. 35 (1982), 238-40.

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