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Part I.—Original Articles.

THE TWENTIETH MAUDSLEY LECTURE: INTELLIGENCE AS A SOCIAL PROBLEM.*

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In 1895, as many people here are likely to know, Henry Maudsley combined two of his earlier books into his famous *Pathology of Mind*. Very near the beginning of this volume, he laid unusual emphasis upon the paramount importance of a study of social conditions in relation to human conduct in general and the varied forms of mental illness in particular. "The study of the individual as an element of social pathology," he declared, "will plainly be a long, laborious, and difficult business of the future." He was right. Fifty years have gone and, in spite of many notable contributions, it is a study still in its infancy.

Maudsley's statement, it will be noticed, was a peculiar one. He referred to "the individual as an element of social pathology." But when he went on to write a long sociological chapter which is still extremely well worth reading, he seems to have reversed this and to be thinking almost entirely of society as an element in individual pathology. I am proposing to try to go back to the original assertion in what seems to be its literal interpretation. One initial comment I must make. As an experimental psychologist it would, of course, be entirely wrong for me to claim any expert knowledge of pathology, individual or social. But there are many matters which are of common interest to the student of normal psychology and the investigator of aberrations in human development. I propose then, taking what is known or suspected about intelligence in the light of current research as my special topic, to consider how qualities which can be treated only as individual, may, by a complex interplay of influences, threaten to produce difficulties which, unless they are directed

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and controlled, will seriously interfere with any achievement of the balanced development of society.

All the main contributions to the systematic study of intelligence came later than Maudsley's period of activity. It is true that Ebbinghaus, a man of brilliant and original powers, had considered, invented and used an intelligence test years before. His scheme, the filling in of blanks in continuous prose, is still employed, and in fact it does involve most of the principles used by verbal tests of intelligence, and now usually illustrated in separate and specific items. Binet was developing a different technique, and Francis Galton, with his irrepressible originality and daring, had made suggestions which carried the seeds of later tremendous developments. But none of this had yet a widely recognized practical significance, and it is not surprising that one looks in vain for any specific discussion of intelligence by Maudsley. Indeed, it was not until Burt, Spearman and others, realizing the possible tremendous educational potentialities of intelligence testing, began the large scale statistical analysis of intelligence test results, that there was any wide admission that a new practical device of far-reaching social importance had appeared upon the scene. And why not? Such a device could first become effective only in a community which had long accepted a large measure of popular education.

Once introduced, the movement to test intelligence was bound to spread rapidly, and so it did. All sorts of people rushed into the field with all sorts of tests, proposed to serve all sorts of purposes. About the tests clustered theories concerning the nature and structure of intelligence which are still hotly debated. It seems fair to say that the simple earlier views, according to which intelligence was thought of almost as a single quantity, fixed in early years and remaining available until, at some indefinite age phase deterioration might set in, have to be abandoned. At any rate, if the most recent type of statistical analysis is to be accepted—which doubtless remains debatable—it seems that whatever it may be that is explored with a modern battery of intelligence tests, it is a very complex function to which some twelve different factors contribute. There is, perhaps in addition, a central " second order " factor, which Spearman called *g*, that influences all the others, but does not necessarily set them into a form of concomitant variation (1).

However this may be, the main general interest in and justification of intelligence tests is pragmatic, and in this respect their use does not in any way depend upon views about the precise psychological nature of intelligence. It is incontestable that the application of the tests has made it possible to predict successfully, in a statistical sense, certain forms of success which are widely valued in present-day society. In particular, probable academic success or failure can be foretold. But not academic issues alone are implicated. It is often claimed, and the claim meets with widespread sympathy, that the same intelligence tests will foretell, in the same statistical way, success in a very wide range of skills. For skill is a concerted response of mind and muscle which essentially depends upon an accurate and rapid perception of similarities and differences in varied settings, and this is also a leading requirement of any modern comprehensive battery of intelligence tests. And so it is by no means a visionary's dream—or as some would rather put it, an awful nightmare—that

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there may come a time when everybody in the modern social group will, from early school days to his industrial or professional prime, carry about with him an intelligence index which will be used powerfully to help to set for him his status and duties in social life. Indeed, already large steps are proposed, in the most public manner, which would lead us, in this country, towards such an end. Let us therefore consider very seriously what sorts of things must be studied and known, if the social implications of a policy of this kind are to be understood.

Intelligence may or may not be an extremely complex function, but at least it is now a common practice for any comprehensive intelligence test sequence to be expressed in three different media or idioms, verbal, numerical and visual. All three, as they are used, are very highly symbolic, for the most approved visual forms, except those for use with very small children, primitive people and some mental patients, are geometrical or other figures of an abstract character. There is much to be said for the view that one of the outstanding characteristics of the intelligent person is a capacity to deal fluently and accurately with symbols. Certainly the bulk of modern educational training is based on that view, and certainly it fairly represents a position adopted and defended by plenty of first-class thinkers, like Hughlings Jackson and Henry Head. Nevertheless, it now seems almost certain that the view is prejudiced and incomplete, and that very serious difficulties are likely to arise in any society which accepts it without reserve.

So far as I am concerned, it was during the recent War that I began to be seriously disturbed by such considerations. It is well known that during the war period intelligence tests, often in conjunction with some others as well, were freely used for purposes of personnel selection. There is a fairly wide belief, and there is some evidence, that they were successful. My own direct experience of these methods was nothing like so extensive as that of many others. But there were in particular two fairly large groups of subjects with whom I had close contact: they were R.A.F. pilots, and some of the Controllers who had charge of the Operations Rooms which directed air manœuvres. Everybody agreed that both of these activities demanded a fairly high level of intelligence. In both cases intelligence tests of an approved modern form were used to assist selection, and in both cases there is no reasonable room to doubt that high scoring on the tests was associated with subsequent success, and low scoring with failure or smaller success. There were, however, a substantial number of exceptions at both ends of the scale, and any impartial examination, either of their frequency or of their character, makes it clear that these are not easily explained. They are not accounted for by the well-known fact that tests of any kind applied to men and women have a statistical significance only; or by unfavourable circumstances in training or operations; or by the fact that practically all known intelligence tests lead to bunching at the top end, so that alleged differences between the more highly intelligent, based upon test performance, have very little importance. I began to wonder whether the intelligence that deals with symbols may be radically different from that which deals directly with concrete situations in terms of those situations themselves.

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About the same time other anomalies appeared. A widely used R.A.F. test for dark adaptation, which included the identification of representative realistic forms, ran into difficulties owing to the fact that such identification appeared subject to learning to a considerable extent. It was at once suggested that this was because these realistic recognition tests are largely a function of intelligence, though it is obvious that if intelligence as tested is itself affected by learning to any extent, the difficulties in the large scale use, especially of high grade intelligence tests, become enormous. However, trial revealed no consistent relation whatever between the perceptual ranking and the intelligence ranking.

It therefore became very worth while to devise experiments to discover whether grading in what may be called " perceptual efficiency " is possible, and if so, what is its relation to other functions of which the only one that now concerns us is intelligence as measured by the accepted tests. The experiments were carried out. Broadly, they required the identification of objects presented in ambiguous or difficult settings. They were conducted by independent investigators and with differing material. The results, in so far as the possibility of grading perceptual ability was concerned, agreed well. The case cannot be regarded as proved, but it is at least highly probable that perceptual efficiency can be measured, that it remains relatively constant from one situation to another, within limits of the kind of material dealt with, and that it has no consistent relationship with intelligence in the accepted test sense (2). To take a simple case, for example, the speed and accuracy of recording different dial readings when all dials and their scales are constructed in the same way has no necessary relation to intelligence (3). The same is true of the recognition of objects presented from some unusual point of view, as in aerial photography.

What about manipulative efficiency ? Here we get a step further still from tackling a problem by means of any interpolated set of symbols. We devised a representative group of experiments in which, for example, some simple mechanical arrangement embodying a familiar device was shown. The subject was then told that a readjustment might or might not be made. He was next asked to say whether the mechanism was the same or different. If he said " different " he was at once asked to put it right ; if he asserted that it was the " same " he was required to set the mechanism into action, and if he had been wrong, to make it work. There were a good many other variations on the same theme. Once again, while it cannot yet be said to be fully proved, the results show that it is highly probable that, if this technique can be said to get at manipulative efficiency, such efficiency does not vary regularly with intelligence as ranked by the approved tests. Manipulative efficiency defined in this way does not agree very well with perceptual efficiency either. One thing is interesting. There are a fair number of people who can see quickly that something is different in a mechanical arrangement, cannot say at all clearly or decidedly what it is, but can, if required, very speedily and accurately put it right (4).

Admittedly, both perceptual and manipulative efficiency present extremely complicated problems and a great amount of more controlled experiment is required, but nobody will deny that they are needed in all sorts of directions

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in the modern social group, and that so long as it remains doubtful whether they bear a known regular relation to tests of intelligence, any large-scale use of the latter alone to determine status and duties must be adopted with extreme caution.

I turn now to another aspect of the same question. In the early years of the war intelligence test results were collected from a very large number of people entering the Fighting Services, together with a record of their pre-war employment. There is, of course, room for error in the employment records, but they are likely to have been substantially correct. As a sample, ten thousand of these intelligence scores were sorted into employment groups, and if we make the assumption that when a man remains in fairly regular employment there can be nothing in its demands at serious variance with his intellectual equipment, we can deduce the range of intelligence which any given trade or profession can tolerate. The only striking differences appeared at the top and the bottom of the total range. The great majority of the occupations required in a modern community are, it seems, so far as intelligence goes, available to the great majority of its citizens. This is, of course, exactly what a general survey of pre-war industry, with the almost total absence of specific selection, would lead one to expect (5).

One implication seems absolutely certain. As every psychologist who is not woefully biased would be willing to agree, practically all measures of human function are measures of range. Indeed, hardly anything else could happen. All human activities are built up in a world of change. They remain stable within a certain range of normal change, and then outside that range are apt to break down, often suddenly and dramatically. The astonishing mechanism of adaptation very often sets steps of range, and the important thing is to know when we move from one step to another. Intelligence measures are no exception, and it seems certain that for the great bulk of avocations the range differences that are important are very much fewer than the measurable differences.

To this there may well turn out to be one vastly significant exception, well-known, but up to the present very little regarded. Practically every set of intelligence tests in common use at present produces a great bunching up in the top range. So while the nature of intelligence in relation to occupation probably makes their scores not very discriminatory in the middle range, the present nature of the tests makes them even less so in the upper range (6).

Lastly, so far as the present line of reflection goes, there is a vast and so far largely unexplored field of problems concerning the effect of test repetition. This has not been an important practical question until lately, and its theoretical significance has been less fully realized than should have been the case. In both ways it has now become vital. We now know that the repetition of tests may push up a person's test score, especially with adults, far more than has been generally recognized. This does not much matter for the purposes of inter-group comparison, since the improvement curves will run roughly parallel. But if scores are used in an absolute sense to assess a person's grade in a total community it may matter a very great deal. How and how much it matters nobody knows, but until we find out the utmost caution is essential.

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Let me sum up and then move briefly to a different, though related, field of thought. There is evidence, but not yet complete proof, that the present approved intelligence tests, by their preoccupation with symbolic efficiency, may entirely by-pass forms of skill which are of growing significance in an industrialized and mechanized civilization. Such tests have little discriminatory value in the middle range, and less discriminatory capacity in the upper range. Repetition of tests may perhaps so affect performance as to render interpretation of scores excessively difficult.

Now perhaps the real distribution of intelligence remains constant from age to age, in any sufficiently large population, whatever the state of popular education. Nobody knows. But certainly the apparent distribution varies if it is based upon performances requiring the efficient use of symbols which are the direct concern of education. There are several good and well authenticated recent studies which indicate that about 1 in 5 of the total present school population of this country reaches an intelligence level likely to guarantee success in University examinations (7). The same methods would certainly not have yielded the same results when Maudsley wrote his great book. It is not silly to imagine that there may come a time when the whole school population, except the mentally defective may, by the same methods, be shown equal to University educational standards. What then? Are we to conclude, as many now openly do, that all those who reach this level should proceed to a University? Obviously, apart from the fact, which I hope I have shown, that the methods may stand in need of much revision, there are other considerations which are of great social weight. We do not know for certain what vocational and professional preferences are set up by a University training. But investigations like the recent extremely interesting Cambridge study of post-graduate careers make it exceedingly clear that such preferences bear no balanced relation to the vocational and professional demands of modern society (8). Already a large number of men and women have to fall back upon second, third and fourth preferences. We may very well be approaching a state in which a very large number, perhaps the majority, will not be able to secure even that degree of satisfaction in terms of their own preferences. Indeed already every year increases the severity of the problem of the "unwanted trade." It is a problem which demands most serious research from many points of view. Among these the psychological is certainly not the least important. Yet, in this country at least, no opportunities seem to be offered or contemplated for its scientific investigation.

The situation is a strange one. The phrase "intelligence as a social problem" probably makes most of us think of the retarded and the mentally defective. It is the "good average" or the "above average" intelligence that constitutes the problem of which I am speaking. We rate intelligence mainly in terms of the symbols of words, numbers and abstract forms. We foster every educational device to make these symbols more and more widely familiar and their effective use easier. At the same time we shut our eyes to the fact that we are building an accumulation of limited preferences and a scale of social values heavily weighted towards a small group of social functions and activities. And we develop a heavily industrialized civilization, many of

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whose human demands are totally at variance with these preferences and these values. The price may be a piled-up mass of individual frustration and disappointment which are the nursery of a sick society.

Intelligence is a quality of the individual. We are therefore back to a most literal application of Maudsley's prophetic phrase, "the individual as an element of social pathology."

It is easy to point these things out: futile unless the effect is a search for solutions. Certainly no sensible person would wish to reverse, even if he could, the expanding course, to change the essential media and character of education. It may be that social values will be altered, until every kind of effective skill will be recognized as carrying a similar and equal claim to what are called the good things of life. It may be—and I think this is far more likely—that society will at length be forced to study seriously the conditions of its own enormous power of productivity, and not simply to talk about it and to appoint some of its citizens to exhort the rest of them to work. Then we can have, as many people have dreamed, an education, especially an academic education, for leisure, consistent with every other kind of training that developing society may need.

Whatever the solution, it can have no sure basis except in fundamental research into the nature of men and the claims of society. Already there is the most urgent need for more penetrative and catholic investigations into the structure of intelligence and the nature and conditions of intelligent activities. Without this we can only go on groping in the dark, or applying methods in a more rigid manner than is justified.

I have chosen to speak about intelligence because it already presents an outstanding illustration of a difficulty which is developing rapidly in modern society in many directions. Every society which at one and the same time sets itself to extend, foster and encourage individual qualities, and to produce a social order which inevitably denies those qualities free expression in the case of many individuals, is asking for trouble. It matters little, for a variety of reasons, so long as the effective groups in society are small. But as the ruling groups grow larger and larger and their demands become both more compelling and more uniform for all their members, there comes inevitably a stage when such discrepancy piles up problem after problem. It seems to me a matter of most vital importance that this and other essential differences between the large and the small social group should be studied and understood. I do not know at what stage of increasing size discrepancies between the qualities and their functions which are sought for the individual, and the needs and their activities which are demanded by society, become an acute threat to social order. But I am convinced that that stage has been reached already in many respects over the whole civilized world, and that in many other respects it is rapidly approaching. There is need as never before for the kind of study which Maudsley, with great wisdom, called for long ago. Disaster can be averted and progress can be assured only if man learns at length to use those scientific principles and methods which he has discovered and of which he is justly proud, to increase his knowledge of himself and to direct his social achievements.

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