insufficient vitality to maintain life, or that fatal cooling of the body had occurred through insufficient development of the heat-regulating mechanism. Examination of the causes of premature birth reveals the fact that the latter is, in a large percentage of cases, unpreventable as far as present knowledge goes. Thus the only preventable cases are those of syphilis and albuminuria, including eclampsia, comprising 39 cases, or about three-fifths of the entire number, and these might have been prevented by antenatal care.

An examination of the causes of death among premature infants, on the other hand, reveals the fact that most might have been prevented, (1) by proper supervision and treatment of the mother during pregnancy, (2) by the adoption of certain precautions to prevent injury to the foetus during birth, and (3) by improved care of the infant during the first month of post-natal life. This improved care can only be obtained by the provision of specially fitted rooms or *couveuses*, on the Continental principle, in which the child's body heat can be maintained until such time as its own heat-regulating mechanism is properly developed, and in which the necessary measures can be taken to guard against infections that are such a serious and constant menace to the life of the premature infant.

IX. SCOPOLAMINE-MORPHINE NARCOSIS.

There were three cases in which the cause of death would seem to have been twilight sleep—at least, asphyxia and other known causes of death were excluded. All three occurred in primiparae, and in all repeated doses of morphine had been given four-hourly, and hyoscine hourly. In all cases the thymus was much enlarged, but was specially so in two, in which it weighed 30 grams and 24 grams respectively, the normal being 10 grams. It seems more than a coincidence that these two thymuses should be the two largest I have met with in 350 necropsies on infants. Instances of increased susceptibility to the action of morphine are not infrequent in the case of infants and young children, and it does not seem unreasonable to suppose that a like idiosyncrasy may exist in the unborn foetus, or that the maternal metabolism in certain cases is slower than in others, thus allowing more of the toxin to pass over into the foetal circulation.

X. MISCELLANEOUS.

There were a few cases in which the cause of death fell into none of the above-mentioned classes. They may be tabulated as follows:

Septic peritonitis from cord infection ...	2
Septic meningitis ...	1
Omphalorrhagia ...	1
Neo-natal asphyxia ...	3
Encephalocele with malformation of the heart	1
Anencephaly ...	2
Double congenital hydronephrosis ...	1
Ruptured liver ...	1
Large thymus (status lymphaticus) ...	1
Deformed chest and rudimentary lungs ...	1

(The case of double congenital hydronephrosis has been reported by Dr. R. W. Johnstone and the writer in the *Transactions of the Edinburgh Obstetrical Society* 1920-21.)

NECESSITY OF EXPERT SUPERVISION OF PREGNANCY.

In conclusion, the great fact that emerges from this investigation is that a very large percentage of the stillbirths and neo-natal deaths could have been avoided by adequate antenatal supervision. Especially is this the case in deaths from craniotomy, asphyxia, and in cerebral haemorrhage occurring in breech and in difficult forceps deliveries. Only about 3 per cent. of the 200 cases had undergone adequate antenatal supervision.

Arguments directed against the preservation of the lives of the unfit certainly do not apply in these cases, for the child that is lost in birth from these causes is generally very large and well nourished, and it is usually just because of this large size that stillbirth occurs. Thus, in the cases of craniotomy the average weight of the child without a large part of the brain was 3,180 grams; of the cases of asphyxia in full-time foetuses the average weight was 3,480 grams—the largest weighed 6,160 grams—

and of the fatal cases of cerebral haemorrhage in full-time infants the average weight was 3,460 grams.

Nor do such arguments apply even in the case of syphilis. If we were certain that every syphilitic infant would be born dead it might reasonably be contended that such was the best possible solution of the problem; and if we were sure that every infant born with congenital syphilis would, if untreated, die, to allow it to do so might be the best course to adopt, both in the interest of itself and of the race as a whole. Fortunately, or unfortunately, however, we cannot be certain that such a termination will occur, either of the pregnancy of the syphilitic woman or of the life of the congenitally syphilitic infant. The latter may, even if untreated, live to bear in its body the major portion of the punishment of the sins of its parents, and therefore the only justifiable course to adopt is the early and adequate treatment of the expectant syphilitic mother, especially as such apparently excellent results in the case of the child are now being obtained with modern methods.

The ideal is antenatal supervision and care of every unborn infant by the compulsory, or preferably by the voluntary, notification of the pregnancy of every expectant mother. Parents of children of school age may be compelled to have remediable physical defects in those children treated. It would seem that such compulsory care of the child may begin too late if only undertaken after birth. Such conditions as mental backwardness due to small non-lethal cerebral haemorrhages or tentorial tears occurring during birth cannot be remedied in the child of school age. They could and should have been prevented. In short, it seems illogical that expectant parents should be allowed to risk the life of their unborn child with impunity, whilst the failure to provide even for its physical comforts after birth renders them liable, and rightly so, to the condemnation of the law and of public opinion.

I wish to express thanks to the head of the antenatal department and to the staff of the Royal Maternity Hospital for their cordial co-operation in this investigation; also to Professor Lorrain Smith for allowing the pathological part of the investigation to be carried out in his department in the Royal Infirmary, as well as for much invaluable advice upon difficult matters connected therewith.

THE PSYCHOLOGIST IN PUBLIC LIFE.

BEING THE PRESIDENTIAL ADDRESS DELIVERED TO THE
METROPOLITAN COUNTIES BRANCH OF THE
BRITISH MEDICAL ASSOCIATION.

BY

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EXPERIENCE in the great war has created, I think, a greater revolution in psychology than in any other science. That experience has, indeed, proved, as nothing else probably could, the enormous advances in surgery and in preventive medicine, but for this demonstration we were prepared. In psychology the effect of the war has been to establish a new view-point, to compel a new outlook. For some years before 1914 pioneers had been indicating new regions for exploration and marking out new roads; but either, as in the case of McDougall, those who followed the pioneer, in spite of the invaluable nature of his work, were disappointingly few, or, as in the case of Freud, the explorer himself, after brilliantly showing the new way, wandered slightly astray into a not very savoury swamp lying by the path. The great war has afforded abundant opportunities for the investigation of cerebral physiology and pathology and of the psychoneuroses, and the work of such investigators as Head and Rivers has directed us more and more to the new regions and has confirmed the fundamental truth of the teachings of the pioneers. Psychology has become not merely the science of mind, mainly concerned with the analysis of consciousness by the method of introspection, but the science of behaviour, whose subject matter is conduct in general and whose conclusions are based on wider observations and experiment than was formerly considered unquestionably legitimate. More and more the human mind is being studied in its biological and its social connexions. New conceptions have arisen of its evolutionary history and its driving forces as

well as of the possibility of a group mind transcending that of the individual. It is recognized that mind has a much wider content than that of consciousness, that human conduct is determined largely by a number of innate powerful instincts, and that no individual mind can be considered as existing apart from the social and environmental reactions which form it and make it what it is. The mind of a human baby should be thought of no longer as a blank tablet on which experience may write what it will, but rather as a network of strong threads already formed by countless generations, on which the effect of experience will be merely to make some regions more closely woven or to connect some parts with new strands. The foundations of human conduct are not reason and intelligence, but a number of pre-formed psycho-physical dispositions. These instincts may be placed in three groups—those relating to self-preservation, including those concerned with response to hunger and to danger; those relating to species preservation, including those connected with sex and with parenthood; those relating to the life of the herd, with their threefold aspect of intuition or suggestion, of sympathy, and of imitation. Intelligence and reason are but the workmen—relatively newly engaged—who on these foundations, and with the materials afforded by them and by the manifold experiences of life, build up human personalities and those combinations of human personalities which form groups, or societies, or nations. This does not belittle the importance of these higher mental faculties, for it is precisely their increasing development and use in this way which differentiates human mentality from that of lower animals.

Psychology, then, has emerged from those somewhat arid regions in which it formerly worked almost exclusively, and has brought itself into a more intimate relationship with the life both of the individual and of the race. The psychologist is a worker who can predict for us human activity with reasonable certainty, and can formulate laws and principles whereby man's actions can be controlled by organized society. Much of his abundant material, gathered from the whole of mental life, past and present, normal and abnormal, is not yet scientifically developed, so that there is still too much room for the unscientific amateur, the metaphysician, the quack, and the charlatan to pretend and to deceive. The credentials and training of anyone claiming to be a psychologist may well be inquired into; the rigid scientific method should always be insisted on; and, in this as in other sciences, the degree of advance and reliability of the science may be judged by the use which is made of careful experiments and of accurate measurement whenever such methods are applicable. Fortunately in several branches of psychology these methods are applied.

In the attempt to secure a harmonious adaptation of man's conduct to organized society, or of human societies to one another or to the whole of which they form a part, two methods are adopted—training and control. They are not mutually exclusive, for, of course, control is one of the necessities of training, and training in many cases and in some ways goes on through the greater part of life. But, broadly speaking, to train the immature from the earliest possible moment up to maturity in that mental attitude and line of conduct which will best suit the society in which the mature life has to be spent is the most effectual method of securing suitable social behaviour, and is a method which can be distinguished from control of the adult individual or more developed group. Such control may be necessary either to restrain antisocial conduct or to ensure the highest usefulness of the services which the individual or the group can render. What is the place of the psychologist in this training and control? In order to give them their most effective direction it is desirable to gauge as accurately as possible four things. We require (1) a measurement of *attainment*; (2) a measurement of *intelligence*; (3) a measurement of *aptitude*; (4) a measurement of *character*. This is not the logical order, or the biological order, but merely the order in which, as a matter of practice, the attempt at measurement has been made.

We are none of us strangers to the attempt to measure scholastic attainment by means of competitive examination. It is not a perfect method, but in the hands of skilful and conscientious examiners it may be a fairly accurate test of the degree in which the examinee possesses that something less than real knowledge and something

more than mere information which it is desirable that he should be proved to have. It is by no means necessary for such a test to be conducted by a trained psychologist, and, although it is eminently desirable that all teachers and examiners should have a sufficient knowledge of psychology, we may still leave to the teaching profession, as such, the measurement of scholastic attainment.

No doubt the competitive examination may serve also in some degree as a rough measure of intelligence as well as of attainment. It will at least enable us to separate the very intelligent from the very unintelligent; but beyond this the method cannot be trusted overmuch. A public examination, too, merely measures the individuals of a group against one another; it does not enable any comparison to be made with other groups or other individuals by reference to a standard scale. This is the real difficulty of the measurement of intelligence. It is not the test that is so difficult, but the evaluation of the result, the giving to it a score on a graduated scale, which, allowing only a small margin of error, would be the same in the hands of any skilled tester. Mental tests are old, mental measurement is new, and it is well known that it was Binet who discovered the scale. He did not merely bring together a number of heterogeneous tests by which he could detect feeble-mindedness; he devised a scale by which intelligence could be measured. It proved not to be a perfect scale, and Binet himself revised his series of tests three times. Others have continued the work since his death in 1913, and now, in what is generally known as the Stanford revision, we have what I think may be regarded as a final arrangement on Binet's lines. It was made by Terman, Professor of Education in the Stanford University in America, and is described in his book entitled *The Measurement of Intelligence* (Harrap, 1919). These tests are individual, and the average time taken for each case is at least half an hour. In the examination of the recruits for the American army a valuable addition was made. Group tests were devised which could be applied simultaneously to large numbers of men with reasonably accurate results. A still later addition has been made by Mr. Cyril Burt in the shape of simple but carefully graduated reasoning tests. All these tests are arranged in series corresponding to the normal intelligence of each year of age from 3 to 14, with others beyond this which are called by Terman "average adult" and "superior adult." The method of application and of marking is very carefully arranged, so that we can get an "intelligence quotient" for each person, found by dividing the real age by the mental age as revealed by the test.

It must be borne in mind that what we set out to measure in these ways is general intelligence only. Special ability in a particular direction may incidentally be discovered, but, in spite of the fact that some eminent specialists may be distinctly lacking in common sense, it is true that high relative ability in one direction is usually accompanied by high ability in others. Certain abilities may be encouraged and others neglected, and some specific abilities may be present in a much larger degree than others, but we are forced to assume general intelligence as a common factor. It is an inborn capacity which probably cannot be cultivated. The only things to be done with it are to measure it and to use it to its full extent. If it is not there the only thing to do is to be sorry for and to protect the deficient being. An ancient writer has told us, "Though thou shouldst bray a fool in a mortar among wheat, with a pestle, yet wilt not his foolishness depart from him," and the modern law directs us to discover the idiot, the imbecile, the feeble-minded person, to separate the educable from the non-educable, to deal in special fashion with those who are educable until their limit of educability is reached, and afterwards to supervise them in various degrees. If it be true that not far short of 2 per cent. of children are mentally defective in this sense; that from 30 per cent. to 50 per cent. at least of the inmates of reformatories and rescue homes, and a large proportion of those in workhouses, prisons, and inebriate homes are mentally defective; that such persons are almost certain to hand on their defect to their offspring; and that their fecundity is not far from double that of the normal population, the gravity of the social problem is evident, and the importance of dealing with it scientifically in its earliest stages needs no proof. The detailed investigations

into the history of the members of certain families—the Kallikak family, the Nam family, the Jukes, and others—bring home to us the possibilities in a most alarming fashion. Economically the results are almost equally disastrous. The last-named family alone is said to have cost directly the New York State 1,300,000 dollars in seventy-five years, and its indirect cost in disease and social influence must have been enormous. More than one-tenth of the educational expenditure of the United States is said to be devoted to reteaching children what they have already been taught but failed to learn. It is not necessary to emphasize the public importance of the functions of the psychologist in investigating such a problem as this, and in discovering accurately those children who ought to be specially cared for.

The psychologist is needed also to supervise this special educational work. The establishment of special classes, into which all kinds of troublesome material are shot as mental rubbish, is a blunder. Differential diagnosis and classification are as important here as anywhere.

There are at least two other ways in which the scientific measurement of intelligence by a psychologist is of great value in the schools. Grant-aided secondary schools in this country are required to take 25 per cent. of their pupils each year as free-place scholars from the elementary schools. The examination of the applicants for these free places presents some difficulty if those are to be selected whose further education will be of the greatest individual and national advantage. If 50 scholars are required out of, say, 150 applicants it will usually be found quite easy by the ordinary examination and teachers' reports to select the first 30 or so and to exclude definitely about one-half of the total number. It is the relative intelligence of the remaining candidates that we require to know much more than their present level of scholastic attainment, and on several occasions within my own experience the strict application of psychological tests has enabled us to resolve the contradictions between teachers' opinions and varying examination results.*

Again, in all classes of all kinds of school the picking out of children of superior ability for attention and advancement is most important, not only for the pupils themselves, but for the future welfare of the country. Such children are often misunderstood at school, and their teachers, for several reasons which are not unnatural, very frequently fail to recognize the superior intelligence which they possess, or at any rate to point them out as requiring speedy promotion; or, still better, special grouping with others of like ability for more rapid systematic progress.

These points are together of such importance that I believe the time is not far distant when every education authority will find it necessary to have the services of a skilled psychologist to devote himself to this work. The teacher and the school medical officer should each of them have sufficient knowledge of the problems involved and of the methods of dealing with them, but they have too many things to do to become experts in a subject which requires special qualities and the practice of which entails a large expenditure of time. The psychologist need not be a medical man at all, but there are advantages in his being one, for conditions of physical disease may easily complicate and require to be distinguished from the defect of intelligence which is being observed. It is obvious that all three officers concerned must work together in the interest of the child and of the study. Given such co-operation, and in skilled hands, I believe that the exact diagnosis of the degree of intellectual health may now be made with no greater margin of error than is found in regard to physical condition.

Success with the exact measurement of aptitude, though considerable, has not been so ample as with the measurement of intelligence. Many of the tests, indeed, used in vocational psychology are not strictly mental at all, but are really physical or physiological. These tests—such as those for steadiness of hand, accuracy of movement, rapidity of reaction, quick recognition of size and shape—lend themselves to exact measurement. But even when we have added to them the tests for general intelligence we still have other factors, such as persistence and instinctive interest, which cannot as yet be so accurately measured.

Fortunately the practical circumstances for which these vocational tests are useful do not necessitate such exact measures as the educational conditions in which intelligence tests are most commonly employed. It is obviously important that a youth in whom the herd instinct is dominant should not be put to work in a lighthouse or to farming in a new colony, or that one in whom acquisitiveness is markedly deficient should not enter on a business career, but in such cases all that is necessary is the broad diagnosis of strength or weakness in the various instinctive qualities rather than the exact estimation of their amount. Nevertheless, even in these directions, tests of fair accuracy are being devised and applied. Already salesmen, street-car drivers, and others have been chosen by the industrial psychologist for appointment; but the most considerable successes of vocational psychology may be said to lie, first, in distinguishing the low-grade worker from those of a more intelligent type; secondly, in fitting low-grade workers into those positions in the industrial machine most suitable in each case for such mechanical aptitudes as they possess. Mr. F. W. Taylor was the initiator of industrial selection on these psychological lines; and though it is to be hoped that the majority of factory workers in this country do possess intellectual energy and instinct fitting them for something higher than this both in industry and in life, yet undoubtedly there are many who may be placed in the complete Taylorist organization just as semi-automatic attachments to a machine. Even for these it is something to be able to choose the right kind of machine; and the elaboration of new tests may yet eventually enable the psychologist to fit the worker of high mental qualities into positions which suit his particular aptitudes, and which will therefore bring most satisfaction to the worker himself and the greatest benefit to the public weal.

Clearly, the higher we get up in the vocational scale the more the measurement required becomes one not of mere aptitude but of character. In the investigation of intelligence, of aptitude, and of character, it is alike true that the qualitative and quantitative examination cannot be entirely separate; but whereas in the case of intelligence we direct our observations primarily to the degree of mentality, so in the case of character we direct them primarily to the quality. Nevertheless, in the latter case as in the former, a large portion of the work is concerned with detecting and assessing defects. Though the measuring of defects of character by more or less exact laboratory or experimental methods has not advanced to nearly the same degree as the measurement of defects of intelligence, and probably never will advance so far, yet there are already a considerable number of mental tests which in skilled hands have proved of great value in discovering and gauging such defects. On the whole, however, the best guide for the diagnosis of temperamental deficiency, or for an inquiry into the basis of abnormal conduct indicating moral defect, must be expert judgement and methodical skilled observation. Such observation will be directed towards the inherited instincts and emotions, and to the acquired sentiments and complexes, to the discovery as to whether these are repressed or unrepressed, as to whether they are properly co-ordinated and controlled, and as to whether they are grouped round some dominating passion or aim. Such analyses of character are necessarily elaborate, and can be satisfactorily conducted only by psychologists of proper training and skill.

Such a measurement of character, as well as of intelligence, is eminently required (1) for the discovery of the so-called "moral imbecile"; (2) for the appropriate dealing with juvenile or first offenders. The official definition of moral imbeciles is "persons who from an early age display some permanent mental defect, coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect." They present the most difficult problem to the lawyer, the doctor, the teacher, and the social worker. Mercier has described them as "clever fools," but the emphasis should be on the noun rather than on the adjective, for although they have a certain superficial ability in adapting their acts to the requirements of the moment they are perpetually bungling their offences and perpetually being caught. Dr. Tredgold describes their basic mental defects as two: (1) they are lacking in the higher faculty of control or wisdom; (2) they have no conception of any social obligation. The official definition requires that these

* An interesting report on the selection of children for higher education at Hamburg on these lines will be found in the *British Journal of Psychology* (General Section) for January, 1921.

defects should (1) have existed from an early age; (2) be apparently permanent; (3) be uninfluenced by punishment. The great social and public importance of detecting such persons before the law gets hold of them requires no demonstration. The school psychologist will be able to find them early in life; and to enable them to deal properly with the cases that came before them—especially with the weaklings who were either moral imbeciles or feeble-minded persons of the more ordinary type—the Birmingham justices appointed Dr. Potts as their psychological expert. "The essential feature of the Birmingham scheme," says Dr. Potts, "is that every prisoner in whose case there is any possibility of such an explanation, or who in any other way is unlikely to be benefited by imprisonment or fine, should be examined by an expert medical investigator either before or after conviction, but in any case before sentence is passed. The report of this investigation is taken into consideration before sentence. In a number of cases the prisoner is placed on probation and the treatment suggested by the investigator made a condition of the probation." Such a scheme should be taken as a model for the administration of justice all over the country.

Juvenile or first delinquents are not necessarily or always of these types of mental defect. There are genuine as well as spurious cases of discharged soldiers suffering from so-called "shell shock" or some form of psychoneurosis which leads to abnormal conduct calling for magisterial attention, and there are other, or the same, forms of mental conflict arising in civilian life which may have similar results. For an example, there is the classical case of the young lady of Bicester. Perhaps you remember it:

There was a young lady of Bicester;
One day, when her lover had kissed her,
She felt so perplexed
That, to show she was vexed,
She gave a great slap to her sister.

History does not record for us whether this case came before the local bench of justices of the peace, but it cannot be doubted that they would deal differently with it if they regarded it as a purely wanton attack upon an unoffending near relation than if they regarded it as an almost natural result of the conflict between the sex instinct and the effects of a severely puritanical upbringing.

No scientific inquiry into the real cause of delinquency or crime can be conducted in court. To quote Dr. Potts again: "One often hears magistrates asking a prisoner what is the reason of his going wrong; in a public court it is very unlikely that the prisoner will state what is the cause, even if he realizes it himself. In the majority of cases the cause can only be elicited after long and careful examination and a private interview. The springs of conduct are in the unconscious mind, and therefore often unsuspected by the individual himself; their discovery requires experience in mental analysis." The habitual criminal always starts at an early age, not later than 15 to 20 years. A woman who is not a prostitute by the time she is 20 rarely becomes one. There is something seriously wrong with a method of dealing with crime and delinquency which has failed to stay the development of habitual offenders. The law punishes, largely on a vindictive plan, the particular offence for which the prisoner is charged, and rarely or never concerns itself with its basal causes in the nature or the nurture of the individual. The psychologist—and here, I think, the medical psychologist—is necessary to reform and to complete the legal procedure, and also to supervise a form of punishment which shall be not only a discipline but a training.

We can go further even than this. In the cases just considered an offence has been committed. Life has already applied a test at which the individual has failed. If the skilled investigation were carried out while the delinquency was yet only potential the stigma of guilt and arrest might be avoided and the community would gain by the prevention of criminal acts. Such potential delinquents come to the notice of the medical profession in various ways, but too few medical men are scientific psychologists, and it would be a great public advantage if there were sufficient psychological clinics to which might be referred, amongst other cases, those borderline cases of deficiency or instability of mind and character in which

expert early attention would prevent the crime, and perhaps cure the patient.

I imagine that to estimate the varieties of excellence of character, and to investigate the causes of super-excellence, may be of at least equal national or public importance as to detect or to measure its defects. In many directions this need is felt, but it is never adequately met. We have all of us had both to seek and to give those unsatisfactory documents known as testimonials or as certificates of moral character. It is, of course, to be remembered that all such documents have to be used with reference as much to what they omit as to what they say, but they are really of no value at all without a considerable knowledge of the persons who have written them, and sometimes they reveal the character of the giver as much as that of the holder. How much more valuable would be the report of a scientific investigation by a skilled psychologist standardized by reference to a recognized scale, especially if such a report were universally required for entrance into any of the professions or for the holding of any position of responsibility and trust! I am not suggesting that the proficiency of the psychologist in this direction has yet reached such a degree of scientific precision as would justify this; nor is it possible to ignore the enormous practical difficulties that would present themselves in application. But, seriously, it is quite possible that what is now true of the measurement of intelligence may some day be true of the measurement of character, and then the exact method would be preferable to the haphazard and the omission of certain important bodies of public persons from these tests would be unjustifiable. There is no test at present either for a member of Parliament or of the Government, minor or major. It is true that the test would not have to be a severe one, for we have to find more than 700 of them; but, if imposed, what might it not save us from! It is perhaps as well that we should occasionally be forcibly reminded—as we have been lately—of the calibre of the intelligence with which we are ruled, if only to make us think of the psychologist as our possible future protector.

Public problems, as well as public persons, require his attention. There are really very few public questions which do not contain a psychological element worthy of useful consideration. Here it is the mind of the group rather than of the individual that has to be studied and weighed. The conclusions of the older economists were largely vitiated because they neglected to take human psychology into proper account; and the conclusions of politicians, and even of statesmen, have often been proved to be radically at fault for the same reason. It is almost a truism to say that if the leaders of the nations before and during the great war had known how to read and to gauge more clearly and certainly the national mind of their opponents there would have been no war at all, or it would have ended much sooner. Many an industrial dispute, too, would have been avoided or have taken a different course if its psychological aspect had been studied as closely as its economic. Psychology, indeed, lies at the root of all the social sciences.

The stage of evolution at which mankind has now arrived is one in which the individual is seeking a closer and more stable adjustment to the human society of which he is a part, and in which such societies are seeking a closer and more stable adjustment to one another. The adjustments required are mainly adjustments of mind. Biological progress has become predominantly psychological in character. We need to recognize that the psychologist has become a person of paramount importance in our social and public life. Properly to train the child so that his adjustment shall be easy and as far as possible automatic; appropriately to restrain the adolescent so that his antisocial actions shall be controlled and his liability to antisocial behaviour lessened; wisely to direct adult activities so that specific abilities may be of the greatest use to the community, are functions which without the psychologist cannot be performed. Without his aid no statesman can safely attempt to reconcile the interests of different classes or to reorganize international relationships. A closer knowledge of the collective mind of the medical profession (not its opinions on a particular subject so much as its general characteristics) would smooth the path of many a Minister of Health. Psychology as an abstract science and as an applied art is becoming more and more a matter of intimate concern

to every one of us; the status of its student, its research worker, its practitioner will become more and more acknowledged.

America is wiser than the rest of the world in this.. The first thing she did on entering the war was to mobilize her psychologists. It was they who sifted the recruits so that instead of the 50,000 cases for which previous experience showed provision should be made in military prisons there never were so many as 5,000. They graded the accepted men, so that those best suited for commissioned work, for non-commissioned work, for special work of various kinds, were pointed out. They arranged the units so that the men of more than average intelligence were appropriately distributed to lighten the whole, and so that the men of technical ability and skill were not improperly risked. In preparation for the industrial competition of the near future America is pursuing the same methods. The methods are not perfect, but they are being improved. The tests are themselves constantly being tested and the skill of the psychologist increased. A suitable use of the psychologist in the public life of this country so that at certain stages of his career each citizen would submit himself to a test of health, of intelligence, of temperament or character, would result in a gain in industrial efficiency, in economic advantage, and in spiritual outlook which would be incalculable. We have learnt to apply the truths of natural science: it is time that psychological truths should be applied with the same courage and conviction.

British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

MALAYA BRANCH.

A MEETING of the Malaya branch of the British Medical Association was held in the Singapore Garden Club on April 21st, 1921.

Relation of Ankylostomiasis to Malaria.

Dr. D. BRIDGES of Ipoh read a paper on the relation of ankylostomiasis to malarial fever in the hospitals of the Federated Malay States. He said that the part played by ankylostomiasis in relation to other diseases did not appear to be generally taken notice of, but this relation was an important factor and a real danger. For the last ten years he had been devoting attention to this question; he hoped to show the relation of ankylostomiasis to malaria.

The returns showed that malarial fever in the Federated Malay States was as bad, if not worse, than it was five years previously; the death rate had risen from 31 to 51.5 per 1,000, in spite of various antimalarial measures which had cost a lot of money, though it must be admitted that these measures had been, in many instances, far from thorough. The ankylostomiasis cases had undoubtedly increased in number. The following figures—taken from about 2,000 patients as they were admitted to one hospital (Kuala Kangsar), regardless of their complaint—showed a general increase.

Ankylostoma Ova Present in Faeces.

					1908-9.	1917-13.
					Per cent.	Per cent.
Chinese	...	...	...	...	58	80
Tamils	...	...	...	...	73	92
Malay and Javanese	...	...	...	...	21	43

Since the first figures were taken the district had been "opened up" a great deal, and on account of rubber the natives could now afford to spend a good lot of their time in towns or travelling about, and did not keep to their compounds as they used to. The hospital returns did not help in any way; all that could be gathered from them was that about 3,000 cases were diagnosed as ankylostomiasis annually in the Government hospitals of the Federated Malay States. This was accounted for by the fact that a

great many cases of obvious ankylostomiasis come into hospital for some other complaint, especially malaria or bowel trouble, and were diagnosed as such; this statement is upheld by his figures, which showed that 75 per cent. of cases admitted for malaria are also cases of ankylostomiasis, and were not merely harbouring ankylostoma. The same might be said also with regard to bowel complaints, especially amoebic dysentery.

It was known that (a) healthy tissues could resist a certain amount of parasites; (b) the virulence of an organism was modified by the condition of the patient into whose tissues it was introduced; (c) the opsonic index of the blood was lowered in disease; (d) in a mixed infection the virulence of the more active organism was increased, and the resulting disease was more severe, with one or two exceptions. Cases having ankylostomiasis nearly all suffered from loss of vitality; there was a general slackness both organically and physically, which increased as the case progressed, and in addition anaemia was more or less marked. The cause of all these was probably a toxin secreted by the ankylostome worm. It was easy to understand that a man in this state of health was a good field for other parasites, such as that of malaria. Not only was he more liable to infection, on account of loss of vitality, but the resulting disease was more severe, this increased severity being again increased by the difficulty of treating malaria in ankylostomiasis cases. This accounted, no doubt, for the large malaria death rate.

From the above observation it was reasonable to argue that as 75 per cent. of the malaria cases were also ankylostomiasis cases, there might have been 75 per cent. less deaths from malaria had ankylostomiasis been absent. We might go further and suggest that the ankylostome worm was as much responsible for malaria fever as the mosquito.

The difficulties of treating these complicated cases were: (1) Quinine could not be given in large or continuous doses without the risk of ill effects such as further complications from the heart, kidneys, eyes, or stomach; (2) these cases did not react to quinine treatment as well as uncomplicated cases did; (3) quinine, if given in addition to ankylostomiasis treatment such as beta-naphthol, often caused severe collapse.

As regards measures that might be taken to treat ankylostomiasis Dr. Bridges suggested the following: (1) That every Tamil coolie who arrived at the dépôt should be treated twice before he was sent to his estate, either before he left India or after his arrival in this country. (2) That this treatment should be properly given by qualified medical men; eight days would be sufficient time in the majority of cases. (3) That as 90 per cent. or more of estate coolies were infected they should be treated on the estates in batches of twenty or fifty according to the labour force; sheds might have to be put up and the treatment should be given under medical supervision. (4) That instead of ordinary latrines as now were put up on estates and which are not used by the coolies, cement drains, with a good flow leading into a pit, should be used—the coolies could squat over these and they would use them; these drains could be swilled with strong disinfectants twice daily. (5) That a severe fine be inflicted should the Health Office or inspectors discover any faeces about the coolie lines. (6) Sand should be spread around all coolie lines, say a distance of twenty yards, and renewed from time to time. This would enable coolies to have more or less clean feet after returning to their lines.

As regards treatment he had tried many drugs and methods of administering them. The best results were got from beta-naphthol and oil of chenopodium, provided a preliminary dose of salt was given to dissolve and cleanse the duodenum of mucus.

(1) At 6 a.m., sodium bicarbonate and sodium sulphate, of each 1 drachm in 1 oz. solution; at 7, 7.30, and 8 a.m., beta-naphthol gr. 10, in emulsion or capsules, and one mouthful of milk. At 9 a.m. a good purgative. The patient was kept on reduced diet the day before, and on the day of treatment. He was kept lying quite still during treatment.

(2) At 6 a.m. a dose of sodium bicarbonate and sodium sulphate, 1 drachm of each. At 7 a.m., oil of chenopodium 2 c.cm., castor oil 1 oz., with the same precautions as in the first administration.

Dr. D. J. GALLOWAY, who presided over the meeting, opened a discussion on the paper, in which Dr. HOOPS, Dr. GIBBS, Dr. DAWSON, and Dr. VAN DORT joined.