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A PSYCHOLOGICAL REGARD OF MEDICAL EDUCATION

Bradshaw Lecture (abridged), delivered before the Royal College of Physicians of London, November 2nd, 1933

BY

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My position here to-day as an industrial psychologist is, I feel, not unlike that in which I often find myself when asked by an employer how, in ignorance of all technical details, I can be expected to increase the efficiency of a particular business. This criticism the industrial psychologist meets by his contention that wide previous experience enables him the better to realise and to remedy defects in analogous situations ; and that, just as commonly the outsider sees most of the game, so the industrial psychologist can often recognise and remedy defects which tend to be overlooked by the expert who has lived in their midst. I wonder whether my acquaintance with general and applied psychology and my distance from medical training and practice may not help me to throw light on the problem of medical education.

For the outlook of the industrial psychologist is a singularly wide one. He does not deal merely with industry and psychology : he is concerned with every aspect of the human factor throughout every kind of occupational life. He is engaged not only in investigating and improving all kinds of business and professional working conditions that affect the mental and bodily health and the happiness and efficiency of the worker, but also in studying the best methods of his training, his recruitment and his selection, and in helping him even earlier to make such a choice of a career as accords with his innate mental and physical abilities, his acquired knowledge, his temperament, character and interests, and his social and financial position.

Different Kinds of Ability

Of innate mental abilities or aptitudes there appear to the applied psychologist to be three kinds : special, group, and general. The last are common to the exercise of all mental processes, though varying in them widely in degree, whereas the first are each particular to some one kind of mental process. The most important general ability is known as general

intelligence—the ability to discern and to utilise relevant relations, whether between ideas, written symbols, or concrete objects. Now two of the most obvious essentials for entry into the medical profession are at least a minimal amount of general intelligence and at least a minimal amount of what we may usefully term scientific ability—the ability to employ scientific methods and to appreciate scientific evidence. Within the medical profession the field of possible occupations is so wide that opportunities are afforded for unusual excess or defect in almost every other kind of mental ability and in almost every trait of personality. The student who is temperamentally averse from close and continual social intercourse may gravitate towards medical research or to preventive medicine; if he excel in manual dexterity, he may specialise in surgery; should his interests lie predominantly in the young, in the poor, in the workings of the mind, or in country life, he may satisfy them by engaging in corresponding medical practice. But unless he be endowed with at least the required minimum both of general intelligence and of scientific ability, no applicant for vocational guidance can be advised to enter as a medical student; high general intelligence being useless to him, if it be conjoined only with literary, musical, or other special abilities, and adequate scientific ability being hardly conceivable in the absence of sufficient general intelligence.

Within the field of industry and commerce, the industrial psychologist always insists that those of the new entrants who have the innate aptitudes requisite for them to rise later to the higher positions in their firm should be recognised as soon as possible and should receive early suitable training to fit them ultimately to such posts. At the universities a similar separation is made: the pass man and the honours man are segregated from the first to receive different educations and to undergo different examinations. Even in the elementary schools it is becoming more and more usual for the bright, the average, and the stupid children to be grouped and instructed separately, so that the more highly intelligent are not hindered by the needs of the less intelligent and the latter are not pushed with the vain object of keeping pace with the former. And despite certain conceivable objections, the advantages of such differentiation have become generally recognised. But in medical education, as in the case of other professional curricula, whatever be their general intelligence and their special

abilities, students are given the same technical instruction ; even though only the ablest may take a first university medical qualification, there are nevertheless vast differences in the general and special abilities of those who obtain it.

Let us consider the medical student whose general intelligence is relatively weak in regard to abstract relations and ideas, but strong in regard to relations in the practical affairs of everyday life. His comparatively narrow interests are in the art of healing, and by virtue of his other mental abilities and of his temperamental qualities he may ultimately make an excellent doctor. But his vision is neither wide nor abstract enough to enable him advantageously to profit by the kind of professional education which is suited to the medical student of higher intelligence—the more strictly *centripetal* kind of education which begins with a number of different, more or less separate, scientific subjects and gradually becomes centralised in the science and art of medicine. In the case of such a student the applicability of the details of pure science to his medical interests needs to be more often kept before him ; he demands a more *centrifugal* education. The question naturally arises, therefore, whether during their five or six years of medical education, as year by year it becomes increasingly complicated, differently gifted medical students will not one day receive correspondingly different training, according as they are innately fitted for abstract thought or for practical action, or even for the medical, surgical, scientific, general, or more special lines of work in their profession.

The Man and the Job

It is the function of the industrial psychologist not only to attempt to give vocational guidance, i.e., to choose the best job for a given man, but also to select the most suitable applicants for vacant posts, i.e., to choose the best man for a given job. The latter he achieves first by observing what are the abilities and the traits of character and temperament necessary for success in that job, and then by devising and applying such methods of examination as will best determine whether or not the candidate possesses those abilities and traits. The candidate's abilities are assessed by specially devised tests, his temperamental and character qualities by a systematically conducted interview. The tests employed by the industrial psychologist are usually intended for the novice and are therefore

of such a nature that they assess innate abilities, not specially acquired knowledge and skills; the interview is so planned as to consist in the separate assessment of the various traits of personality which are needed for success in the particular occupation, as well as in a final assessment based on the general impression which the candidate gives the interviewer.

But the wide field of the medical profession provides opportunity for the exercise of so many varieties of special ability and of temperament and character, that these general methods of vocational selection require modification. Nevertheless they could be readily applied to eliminate the unsuitable entrant to the medical profession on the grounds of his lack of innate general intelligence and scientific ability, thus taking the place of the present examinations which are too often tests of memory and of ability to reproduce the acquired minutiæ of general and scientific knowledge, and which allow the candidate to enter repeatedly until he has crammed sufficiently to satisfy the examiners.

PREMEDICAL STUDY

If the prime object of premedical scientific study had always been to teach the broad principles of natural science, selecting only such facts and details (apart from those needed to establish and adequately to confirm those principles) as are likely to be of practical help to the average doctor in his professional career, there would not have now arisen the general complaint against the teaching of physics, chemistry, and biology to the medical student. These subjects, however, are taught not by persons who have any medical training or interest, but by professed chemists, physicists, and biologists. They are not sufficiently taught, as conceivably they might be taught for the school-leaving examination, with a view to improving general culture; nor are they taught, as conceivably they might be taught for the first M.B. examination, with a view to training doctors. Too often the teaching proceeds on the assumption that there is only one way of teaching and examining in a subject —namely, in order to prepare his pupil to become a specialist in that subject—a fallacy which, until recently at least, has been recognisable throughout the medical curriculum, in physiology, anatomy, pathology, and even to some extent in the special departments of medical and surgical practice. It

seems worth consideration whether the time has not come to establish a definite medical discipline throughout the training of the medical man.

A lengthy research which has just been completed at the National Institute of Industrial Psychology has demonstrated that the effects of routine practice at any given manual operation (and the same appears to hold for any given mental operation) are hardly transferable at all to other manual (or mental) operations; whereas the effects of a systematic training in the general principles underlying the performance of any one operation are very distinctly transferable so as to improve the performance of other more or less similar operations. Such experimental results bid us no longer assume that the routine exercise of memory in learning masses of formulæ or other details, or the routine practice in acquiring various skills through hours of titrating, staining, dissecting, or other laboratory work, provides a useful practice-ground for the subsequent learning of other material or for acquiring skills of other kinds. Routine practice increases the speed and accuracy of performance mainly by the elimination of needless and harmful mental or muscular processes and by the coördination of necessary processes so that they become integrated and can be performed more automatically. Although by training we cannot hope to improve any innate ability, we can improve methods of making the best use of what is inherited. What is of special value for this purpose is a knowledge of underlying general principles; and this, in the case of physics, chemistry, and biology, should be largely imparted before the age of 17, while these subjects are being taught, not as introductory to a medical future, but as a necessary subject of general education.

At the present time, a lad's general education ceases at school when, at the age of 16 or 17, he has passed his school-leaving examination. Thereupon he proceeds to specialise; and if he chooses the medical profession, he devotes his whole time to physics, chemistry, and biology, just as if he were training to become a physicist, chemist, and biologist. Surely the medical student of average ability or less need not spend so much time on masses of detail which, having little bearing on general principles, will be later forgotten; nor should his practical work be carried to such an extreme that it has no corresponding educational value for the doctor. Even if we regard such acquisitions as excellent for the man of high

scientific ability and as valuable generally in providing an ideal unconscious background for the student's professional career, their enforcement implies the assumption that at 16 a lad's general culture no longer needs encouragement; it implies that henceforth he may forget and make no progress in what little he has learnt of literature, history, and languages, and that he may devote himself entirely to natural science. Almost any subject can serve to promote general culture, if only it be taught from a sufficiently wide point of view; but there are few teachers of natural science who are competent so to teach.

If the countless hours now spent in practical work in physics, chemistry, and biology served a commensurate psychological and educational purpose in the case of the average medical student, less objection could be urged against them. The value of such work could be enormously enhanced if it were more carefully directed towards training and exercising what is so essential for the successful diagnostician—the ability to select and to draw deductions from the available evidence. Such training, however, has been neglected, not because its importance has been underestimated, but because it is so much more difficult to examine the candidate in these abilities than to examine him in and to mark memorised facts.

Two other important objects of practical work are: (1) to improve the student's memory and realisation of facts by getting him to reveal them by his own handiwork instead of by merely hearing and reading about them in other people's words, diagrams, and pictures; and (2) to impress on the student the principle of not relying on the statements of others, but of verifying them by experiment and experience. But many would agree that these objects could be attained with less expenditure of time. Yet another object is often advanced in favour of practical work: that it is heuristic in character and therefore that it encourages the spirit of discovery. But in fact it seldom does anything of the kind. For the student is always forewarned in his practical work what he is to expect; and if he fails to find it, he seldom learns why he has found something different. All that he realises is that he has done the experiment wrongly, and he repeats it until he gets the text-book result. In other words, his practical work consists merely in confirming what is already known to him; in his subsequent anatomical dissections his aim has even been to "make it look like 'Gray'"!

The average medical student would not suffer if he were no longer required, as in my day at least, to recognise the form and size of each of the small bones of the wrist and hand, or to describe, as he is to-day asked, the origin, course, and relations of the thoracic duct or of the obturator nerve, the arterial supply of the spinal cord, or the course, tributaries and relations of the inferior mesenteric vein. Nor would he suffer if he were no longer expected to dissect the entire body. The divorce of the old human anatomy from physiology has resulted in the former becoming a subject of medical study which, as such, affords little scientific training. It consists too exclusively in learning innumerable facts. Embryology may throw a little of the light of science on them ; comparative morphology, which might do so, hardly finds room for admission. Moreover what the medical student learns of human anatomy is derived from dissection of the cadaver, the desiccated organs of which have lost their true form and their relations in the living body. Little attempt is made at this stage of medical education to gather anatomical information from the recently alive corpse in the post-mortem room ; the living subject and the teachings of radiography are also too often neglected. The movements of the viscera are hardly ever seen by the student of human anatomy, nor are the synergic actions of the skeletal muscles explained to him ; structure is taught too entirely divorced from function, both normal and disordered. Even the acquirement of manual dexterity in dissection is not assured.

Teachers who cannot Teach

Other defects in medical education are largely attributable to the inadequate selection of teachers and to the increasing number of specialised subjects. From the start to the finish of his medical education, the student is taught by those whose only qualification to teach is their professional eminence. The industrial psychologist has had ample experience of the fact that the most successful and efficient worker does not necessarily make the best teacher. In industry it is mainly a matter of teaching manual technique ; and not infrequently the expert proves unable to describe correctly how he carries out a skilful operation, or when he illustrates it at a slow pace he

is found to employ movements quite different from those which he employs to perform it at his normal speed. Because there may be many different styles of procedure adopted—e.g., by various surgeons of equally high skill—that is no reason why the student should not be instructed in the general principles which must underlie all good methods and be taught how to avoid bad operative procedure. The industrial psychologist recognises that there is no one best way of doing anything, but that there are a number of equally good ways suited to different persons ; he also recognises that there are undoubtedly bad habits of work into which the operative must not be allowed to fall. Similarly there are good and bad methods of the doctor's approach to and general handling of his patient. Yet how seldom is adequate instruction given to-day in such technique, and how rarely is the medical student examined therein.

At the universities it is notorious that the ablest professors may make the worst lecturers. Yet, alike at the universities and at the medical schools, no attempt is made to select or to train teachers, whereas to those who are preparing to teach in elementary and secondary schools systematic instruction and subsequent examination in the science and art of teaching are given. It is not surprising, then, that undergraduates complain of the inadequate teaching they too often receive, and of the number of unwanted lectures they are forced to attend. Facts, they rightly argue, may for the most part be learnt from text-books ; " tips " and mnemonics (if alas ! necessary) from special " grinds " ; it is the coördination of facts and their application, the acquirement of technical skill, which they seek to learn through their teachers.

Moreover, from the start to the finish of his medical education, the student is taught by specialists in far too watertight compartments—by chemists, biologists, anatomists, pathologists, pharmacologists, gynæcologists, oculists, and a host of others. The average medical student will become a general practitioner, with one thousand insured persons, and often more, under his care. Yet from the start to the finish of his education he never comes in touch with one of his own future kind. Even in the general wards of a general hospital he is taught by consultants who are usually specialists in some branch of medicine or surgery, or at all events cannot pretend to as full a knowledge of the whole of either of these subjects as

is expected from the student at his final examination.

Physiology, pathology, and the like can be taught by their specialists, as pure sciences should rightly be taught, in total disregard of their applied value—their practical applications to medicine and surgery. Knowledge of and research in pure science are very properly prosecuted for their own sake, not for their possible usefulness. The life-history of bacteria or the histology of tumours may be studied by one who has never seen their manifestations or appearance in the sick person. But what can the terms anthrax or carcinoma mean to the student if he is introduced to them when he has never seen a case? Undue stress tends to be laid on problems which have been subject to current or recent research, with neglect of more commonplace and practically important knowledge. The physiologist, for example, has carried out relatively little research on the rate of progress of food through the alimentary canal, on diet, or on the physiology of growth, childhood, youth, and old age. He may remember little, and does not prepare the student for what he will later learn, of physiological knowledge derived from clinical observation. The capture of histology from anatomy is but an index of his dominant interest in minute physiology—of the cell and of isolated tissues and organs—rather than in the intact organism.

How many of the details in these various sciences with which the medical student is now overburdened will he remember unless they can be and are associated with their applications? Some details are of course essential for the grasp of general principles. But many of them are only necessary for the equipment of the professed chemist, physiologist, or pharmacologist. How much more interesting, especially to the student of limited outlook, and how much more readily learnt by him would those details and principles be which are demonstrably of practical value for future practice if their applicability could be explained to him at the time, instead of treating them as the property of a pure science. Until recently our British practice has been to keep the medical student, as if in a monastery, remote from the world of medical experience, while he bathes in the pure sciences. Surely the right course lies midway between this and the French practice of making the student spend half his time in the wards as soon as he begins to study anatomy and physiology.

Biological Differentiation or Mechanical Analysis

In educational specialisation it is important to realise the profound difference between biological differentiation and mechanical analysis. Even the unicellular organism digests, excretes, secretes, respires, and propagates. Although it has no nervous system, it is irritable and sensitive to changes in environment; it moves, and in virtue of its vitality and especially of its mobility, it must be credited with some rudimentary consciousness, however different from our own. In the multicellular organism specialised tissues, organs, and systems make their appearance, each consisting of cells which are differentiated to undertake predominantly one or other of these different functions—one tissue, organ, or system specialising in digestion, another in excretion, a third in respiration, a fourth in coördination and direction, and so on. But this differentiation is never complete. Each individual cell still carries out virtually all of the functions of the unicellular organism, in addition to specialising in its own particular function; each cell takes up oxygen and nourishment, it still excretes, it is still able to propagate.

Is that not the ideal method of specialisation at which we should aim in medical education? Psychological experiments have shown that it is generally easier to learn a whole as a whole than by learning separately its constituent parts. Therefore, should not the future clinician in his hospital period receive first a more complete education in the whole range of medicine and surgery before he visits the specialist departments to learn about the rarer diseases? At present the commoner manifestations of these specialties are not seen in the general wards and the general out-patient departments; unlike the individual cells of the multicellular organism, the general consultant physician and surgeon has lost touch with them. And the specialist cannot help being more interested in the rarer diseases of his specialty which are relatively of less importance to the future practitioner who would prefer instead a fuller training, say, in passing a Eustachian catheter, in incising the tympanic membrane, in washing out an antrum, in injecting varicose veins and piles, and in becoming familiar with remedial exercises and with the rudiments of orthopædic cobbling.

Instead of following the path of biological differentiation, medical education has evolved rather along

the lines of mechanical analysis; as if a chemical compound had been split into its constituent radicles and instruction confined to these isolated factors, regardless of the fact that the whole is far more than the sum of its parts. Biologically and psychologically, first comes the vague undifferentiated whole—the unicellular organism—and later appear the discrete parts. Logically, but unpsychologically, the parts are first learnt without reference to the whole; and somehow, without adequate system, those parts are expected to be synthesised by the learner. Thus is perpetuated the fallacy of treating each patient not as a living unitary individual, but as a case of a certain single disease, and the tendency persists to divide diagnostic and therapeutic methods into those belonging to the clinician and those belonging to the laboratory scientist, into those belonging to the physician and those belonging to the surgeon.

For the origin of this attitude the history of medicine is largely responsible. In bygone times surgery was not regarded by the physician as his proper province, and has therefore developed on independent lines. The psychological effects of this isolation are not yet eradicated. They are only too readily imitated from their chiefs by young house physicians and house surgeons, the former regarding the latter much as a philosopher might regard a manual labourer, the latter regarding the less direct procedures of the physician as mysterious and unprecise gropings in the dark.

Clinician and Scientist

Not less is the mutual contempt and distrust of the clinician and the scientist. Medicine began as an art, based on few systematic principles and on scant scientific information. Its technique has grown to such proportions, medical knowledge has so vastly increased, that in some quarters medicine tends to be regarded far too strictly as a science. As an art, it demanded, like other arts, the exercise of intuition—the arrival at decisions concerning diagnosis and treatment, not always through reason and intelligence, but through the flashes of insight due to the unconscious workings of the mind, determined in direction and value no doubt by previous experience. In former days too medicine was forced to lay greater stress than now on drugs, diet, external environment, on the vis medicatrix naturæ, on the constitution or diathesis of the patient and his family, and on the

personal influence of the physician. The medical student acquired his training by apprenticeship to a private practitioner. But now in virtually all occupations the place of apprenticeship has been taken by technical education. Within the memory of many of us a period has passed away when injuries to joints and bones and visceral diseases and disturbances were ascertained largely by the doctor's own ear and hand, and when it was usual for the student himself to carry out blood counts, the examination of urine, &c., of any of his patients within the hospital wards. Since then elaborate new methods of examination have been devised, the patient's fluids being removed to the pathological building for report or referred to a special department for an X ray photograph or an electrocardiogram. Of the practice of all these less subjective, more scientific, methods of procedure, the student learns something by his visits to these departments and especially through the university clinic teams which have been established in a few teaching hospitals.

But inevitably the hospital consultant's knowledge of these methods and his faith in them are less profound than the scientist's. He knows that diagnosis and especially treatment cannot depend always and wholly on the aids which laboratory methods can render. He realises that the teachings of physiology and pathology in their experimental work on various living fractions of an entire organism are not always applicable to the entire organism ; that, as an individual, the patient cannot be considered a mere appendage to the bacterial invasion or other cause responsible for a disease or a growth. He is convinced that the experience and insight of the clinician must stand guard over the applications of research.

And just as the ablest clinicians recognise not only the limitations of research, but also the inestimable value of the new instruments of technique with which medical research has provided them, so there are research workers fully aware that pure research must always be the servant, not the master, of the physician or surgeon. They admit that in the treatment of the sick other considerations must be taken into account besides conclusions drawn from experiment and based on a purely physical standpoint. Nevertheless, they fear, not without foundation, that the excessively empirical attitude of many hospital consultants tends to extinguish the research spirit of students. They lament that, both for this reason and because physio-

logy—or more particularly biochemistry and biophysics—seduces some of the most promising research workers from completing their medical education, recruits are now lost to medical research of a more strictly clinical kind. They would therefore have the medical student, before he comes in touch with patients, better prepared for the wide gap he will discover between the simplicity of experimental science and the complexities of practice.

Unpreparedness for Practice

The average medical student realises too late that in practice he cannot depend for diagnosis and treatment on the elaborate methods he has seen employed during his hospital education. Small wonder that he comes to wish he had not spent so much time in learning technique, in attending grinds, and in being spoon-fed for examinations where he may be questioned on the characters of the organism responsible for bubonic plague or the microscopic structure of teratomata of the testicle. Small wonder that he comes to wish he had spent more time in the wards, and less time in seeing the rarer operations in the theatre; that he had learnt more about prescribing drugs and diets, and gained more personal experience in bandaging, passing a catheter, and other manual dexterities, particularly in such common or emergency operations as empyema drainage, blood transfusion, and those needed for amputations, appendicitis, or strangulated gut. He will regret he had been encouraged to give so much attention to the methods of diagnosis of rare conditions and so little to treatment, particularly in the early stages, of such common diseases as colds, sore-throats, rheumatic and gouty affections, and disorders of digestion, and in the late stages of incurable diseases of which he saw so little in hospital.

The general practitioner realises too late how unprepared he is for the conditions he will meet in practice; how often he is forced to rely on intuition as to whether or not a patient deserves systematic examination for the diagnosis of his state; how little he has learnt of the palliative, as distinct from the curative, functions of the physician and surgeon; how ill-equipped he is to give advice on general health and hygiene, particularly in the case of children, and expectant or actual mothers, and on prognosis in relation to insurance companies; how little he has been taught of preventive medicine and of the public

health services that are now required of him ; how ignorant he is of the best attitudes and approaches of the practitioner towards his patient, of the motives and other determinants of human behaviour, and of the anxieties and the marital difficulties of his patients which are so often a fundamental cause of their bodily ill-health.

Fundamentally, it seems to me, the whole problem arises from the conflict between the ideals, needs, and interests of the general practitioner, on the one hand, and those of the medical scientist and the consultant on the other, who are his sole teachers during his years of clinical study. If a common curriculum must at present be maintained for the education of all three, can there be any doubt that just as an appropriate training is provided immediately after qualification for the future medical research worker and for the future consultant physician and surgeon, so immediately after qualification an appropriate further training given by experienced general practitioners should be provided for and required of the future general practitioner before he receives his diploma or degree ? It is hardly necessary to point out how different is the life-work of the consultant and the general practitioner and the relation between them and their patients.

A Mechanistic Outlook

The difference in outlook of the medical scientist and the medical practitioner deserves some further consideration. The physiologist and the pathologist tend to regard the human being as a collocation of physical mechanisms. They restrict the term science to the mathematics, physics, and chemistry of matter. If living matter consists in more than these, then that " more," they argue, lies beyond the domain of science ; anything in life resembling the direction and purpose which we all recognise in our own minds is foreign to natural and to medical science. And so the medical student learns, from start almost to finish, to regard the living organism merely as an aggregate of machinery. While he is taught in the utmost detail the functions of the normal human body, he learns virtually nothing of the functions of the normal human mind. All that he is taught of this in his physiology is a mere smattering of facts about touch, taste, hearing, and vision, mainly in so far as they can be brought into some more or less hypothetical relation with material structures in the skin, tongue,

cochlea, or retina; and a mere smattering of facts about visual, auditory, and verbal perception and imagery, partly because, on quite erroneous grounds, it has been supposed that the "seats of consciousness" for percepts and images have been experimentally localised in definite areas of the cerebral cortex.

He learns nothing in his physiology of the relations between mental and bodily activity; he is taught nothing about the emotions, despite their intimate connexion with endocrine and visceral activity. He learns nothing about intelligence, although later he will have to consider it in relation to mental and endocrine deficiency. He learns nothing of the psychology of suggestion, despite its frequent use by him in everyday practice. Of memory, impulse, and volition, of the differences between the mind of the child, the adolescent, and the adult, he also learns nothing. All that is required by the General Medical Council, in a regulation now exactly forty years old, is that before qualification the medical student shall have attended at least four-fifths of a course of 12 lectures on mental diseases and 12 clinical demonstrations at some recognised institute for the insane. Of the mechanism, of the results, and of the treatment, of the common quasi-normal mental disturbances and of the uncertifiable disorders of the mind, he learns virtually nothing.

Is this an adequate preparation for appreciation of the important part which the mind is now almost universally recognised to play in bodily disorders? Does it not tend to perpetuate the hardly bygone times, when a psychoneurotic patient might be sent from department to department of a general hospital to be treated according to the temporary manifestation of his unrecognised psychoneurosis; or when in private practice such a patient might be successively submitted to a series of operations? Does it prepare the practitioner to recognise the psychoneurotic element responsible for some of the commonest disorders of digestion, respiration, menstruation, and circulation? Does it give him any knowledge of the nature and phenomena of mental conflict and repression, of mental maldevelopment, fixation and regression, so that he knows how to treat mental depression, drug addiction, sexual aberrations and malpractices in adults, truancy, stealing, stammering and enuresis in the young? Does it prepare him for the increasingly recognised fact that the general practitioner can do much to prevent not only ill-health but also juvenile delinquency?

Put Psychotherapy on a Firm Basis

Is psychotherapy, with the psychological training preparatory for it, to be excluded from medical education because of the wild claims and generalisations of certain schools whose rival extravagances, nevertheless, are based on discoveries of undoubted truth and importance? Just as it has been said that biochemistry and biophysics—which originated not from chemistry and physics but from physiology—urgently need recruits from among pure chemists and pure physicists, so it is important that modern psychotherapy—which arose not from psychology but from medicine—should obtain recruits from those who have received the systematic training of experimental psychology, in order to place this latest specialty on a firmer scientific basis. Even if a long period of expert treatment by specialists is requisite in certain cases, especially in neglected cases, there are numerous others which can be successfully treated by the general practitioner if only he had been trained to recognise and treat the prevalence and presence of psychoneuroses. Surely the teaching of psychology, psychopathology, and psychotherapy is not to be excluded from normal medical education because hitherto the physiology and pathology of the body and pharmacology have appeared to be so much more important that it has been impossible to find time for the study of mental processes; or because the study of the mind can never be recognised as a science until suggestion, memory, will, hysteria, hypochondria, anxieties, and fears have been allocated to a material basis? "Imaginary diseases," I recall my chief once saying to me during my house physicianship, "require imaginary remedies." This was the view largely prevalent thirty or forty years ago, when it was the practice to treat medicinally or surgically every disorder which could be attributed to localisable and visible disturbance in a bodily organ or system, and to consider psychotherapy only when the disorder was of an inexplicable, "functional," nature. The fallacy underlying such a view is, I fear, by no means extinct to-day.

It may be urged that my psychological training leads me to exaggerate the importance of this subject. But the medical psychologist has clearly demonstrated the importance and prevalence of emotional and psychoneurotic disorders in the factory and the office, not only as causes of industrial unrest, but as responsible for much of the long or repeated

absenteeism ascribed to gastritis, rheumatism, heart attacks, or dysmenorrhœa. Moreover, since psychology, psychopathology, and modern psychotherapy have had hitherto no place whatever in the official general medical curriculum, any distortion of their claims on my part (which I do not for one moment admit) becomes of little importance. Similar objections must indeed confront every advocate of progress in medical education. For medical education is, as we have seen, almost wholly in the possession of specialists, each with his own vested interests, each maintaining the supreme importance of a full knowledge of his subject for the medical student, and strenuously opposing any reduction in the time devoted to it.

Apprenticeship

Progress can only be made if a conscientious effort is made in common to determine and to agree upon the objects of medical education. The school teacher during his training learns not only what, but also how, he is to teach. The clergyman during his training learns not only what, but also how, he is to preach. Both teacher and clergyman are instructed in the practical difficulties with which they will meet in their future educational and parochial work, and how these difficulties may best be overcome. Such training will not make a teacher or a clergyman efficient, if he be naturally unfitted for his work. But it will unquestionably serve him as a short-cut to success, saving him unnecessary trials and errors in the otherwise needlessly dear purchase of experience.

In the professional part of medical education and examinations, can we rest satisfied with the current proportions of stress laid on knowledge of general principles, facts, and implements, on the one hand, and on skill and wisdom in their use in actual practice, on the other? If surgery cannot be properly learnt from actual operations until the student has passed a qualifying examination, such learning should surely not be deferred until the newly fledged general practitioner is earning his living in private practice. If the surgical specialist acquires his experience by years of hospital surgery and attendance on his surgical chief after he has attained his first medical degree, surely the general practitioner should be similarly compelled—for a briefer period—to do likewise. Could there not be a kind of apprenticeship period for the general practitioner between the passing of the present examinations for a first medical

qualification and the actual conferment of the first medical diploma or degree? Such apprenticeship would be needless for the future specialist and research worker, who would continue, as at present, to work for a higher medical, surgical, or scientific degree. The increased duration of education will be urged against a period of apprenticeship. But if the time at present devoted to physics, chemistry, and biology after the school-leaving examination could be reduced; if the years devoted to anatomy, physiology, and pathology could be shortened, or even if these latter subjects could in part be learnt at first broadly as part of biology and later in more special relation to surgical and medical needs; if the work of the special hospital departments could be learnt rather in a general than in a special way—probably no extension of the present period of general medical education would be needed. Indeed room could be found for the inclusion of instruction in the elements of normal psychology, psychopathology, and psychotherapy.

Other Conclusions

Differentiation in teaching and examination between students of moderate and brilliant intelligence, at all events in regard to preclinical studies, appears on psychological grounds likewise much to be desired. For the pass-man a knowledge of fewer facts of professional unimportance should be expected, even if he enter for one of the present diploma examinations. A more definite medical discipline or universe must be evolved. The medical student's teachers need to be more stringently selected on the basis of their ability to teach. And finally, effort should be made to bring his medical, surgical, laboratory, and clinical research teachers—and the subjects which they teach—into closer relation with one another.

These, to a medically qualified psychologist, appear to be the most urgent needs for reform in current medical education.

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