THE
British Medical Journal.

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

LONDON: SATURDAY, SEPTEMBER 1st, 1923.

EDUCATIONAL NUMBER, SESSION 1923-1924.

PERMEATION OF THE MEDICAL CURRICULUM BY PREVENTIVE TEACHING.

BY

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A NEW epoch opens this year before the students of medicine. In 1922 the medical curriculum in Great Britain was completely revised and reconstructed in such a way as to make it more preventive in purpose. The changes introduced had, of course, other collateral objects, but this was one of the special aims, and it was sealed by a resolution of the General Medical Council "that throughout the whole period of study the attention of the student should be directed by his teachers to the importance of the preventive aspects of Medicine."

The medical schools are devising, or have already made, arrangements to carry out the new recommendations of the Council. These arrangements will no doubt be subject to the periodical visitation of the Council's inspectors. It is anticipated that examiners also will look for and require substantial evidence of the student's appreciation of the importance of dealing with disease in the "preventive" way, of not only knowing how to diagnose and cure immediate maladies, but of being in a position to advise the patient how to order his life in such a mode as to direct his personal and environmental tendencies towards health. It is a new outlook.

There were two fundamental reasons for this new attitude. First, it had come to be recognized that as compared with the twenty-three centuries since Hippocrates we are living in a Golden Age of Medicine, the chief glory of which has been the advance of prevention; and secondly, it is now generally acknowledged that the ultimate purpose of the science and art of medicine is not to cure the individual patient only, but to seek out the laws or principles which govern health or ill health for the human family. The nobility of the profession of medicine reaches its highest plane in compassion towards, and the relief of suffering of, the individual on the one hand, and, on the other, the finding and establishment of scientific truth which shall advance the evolution of man.

THE VICTORIES OF PREVENTIVE MEDICINE.

Let me name four recent examples of the victories of preventive medicine in its communal sphere, which will illustrate the methods to which we must have regard. We need go no further back than thirty years. In 1893 there were in England and Wales 6,801 deaths from *typhoid fever*, or 229 per million persons living; in 1903, this disease caused less than half that number of deaths (3,347 persons); in 1913 the death rate had fallen to 41 per million; and in 1922 it had come down to 12 per million, which meant only 443 deaths from a disease which formerly made an annual toll of eight or ten thousand lives. The

case fatality remains about the same (15 to 20 per cent.) and the type of disease has not materially changed. *But the disease is disappearing.* Why? Because the public water supply is improved; because drainage, sewerage, and refuse disposal have been reformed, and the food supply, including shell fish, has been controlled. There is no mystery about it, nor any doubt. Inoculation is available, and has been used in exceptional circumstances, though not widely, in the civil community. Its value, in conjunction with general and special sanitation, in the European war, 1914-18, is unquestioned. In the South African war the British Army strength was 208,000; there were 58,000 cases of typhoid, and 8,000 men died of it. In the European war the British Army on the western front had a strength exceeding a million men, but there were less than 7,500 cases of typhoid and only 266 deaths. In the army or the civil community the result is the same: the disease is conquered.

A second example is small-pox. In London from 1660 to 1780 Farr estimated from the bills of mortality that small-pox caused upwards of 4,000 deaths per million living. In England and Wales in 1838-42 the rate was 575 and in 1886-90 it had fallen to 14 per million. Why? Because of vaccination. It has been proved beyond doubt that vaccination was the specific agent in this decline, the specific protection against this disease. The malady was all but a universal scourge, and it is now entirely controllable. The vaccination laws may or may not be wise, ineffective vaccine and inefficient vaccination may or may not occur, the protection afforded may not be of indefinite duration; but in all countries the experience has been the same—vaccination prevents small-pox. It is not a disease which is dying out like black death or leprosy. When reintroduced into an unvaccinated community it returns, whatever be the sanitation. We have control if we choose to exercise it, but because of prejudice or ignorance we have not yet reached the stage of stamping it out for ever.

Tuberculosis is a third example. In 1847 the death rate per million from phthisis in England and Wales was 3,189. It has steadily declined for seventy years and in 1921 it was 854. Non-pulmonary tuberculosis is likewise declining. If the disease be as widely distributed as is generally supposed, it must indeed be one of the most curable of the great scourges. What is the explanation of its decline? The answer is prevention. An improved milk supply, institutional treatment of the disease, better nutrition, sanitation of the home and the workplace, the reduction in the habit of promiscuous spitting, and an immense advance in social well-being are, in spite of voluble and inconstant

declarations to the contrary, steadily gaining ground over tuberculosis.

The last example I need cite is the prevention of a high infant mortality. At the end of the nineteenth century there died every year in England and Wales 150 infants per 1,000 born. In many industrial districts the figure was 300. In 1922 it had fallen for the whole country to 77. What has happened here? No doubt many factors have contributed, but the most potent have been more enlightened motherhood and infant nurture.

Now here we have four examples of the effect of preventive medicine applied to the community through the operations of the State or the municipality. They have effected a postponement of death and an enormous betterment of man's physical condition and capacity. But it was Medicine, medical science and medical art, which first determined the causes or conditions of these diseases, and then conceived the means of their prevention. Many and complex have been the factors at work, but in the four examples quoted (a) improved sanitary environment, (b) vaccine, (c) personal and social hygiene, and (d) enlightened motherhood, emerge as dominant.

SOME UNDEFEATED ENEMIES.

We must now take a further step in the argument, and ask ourselves if preventive medicine can be applied to other morbid conditions, which, though not national or racial scourges, do, in fact, prove themselves to be the most formidable enemies we have to face. What are they? There are two bodies of data immediately at hand. There were 486,780 deaths in 1922. The chief cause was respiratory disease (non-tuberculous), responsible for 18 per cent.; next came diseases of the heart and circulation, 16 per cent.; then nervous diseases and cancer, 10 per cent. each; then tuberculosis 9 per cent. So that 63 per cent. of the total number of deaths was due to five great groups of disease. What has preventive medicine to say to these? There is another body of data which illumines the situation—namely, the causes which take upwards of seven million patients to their insurance doctors every year. A survey was made in 1921 of 36,000 cases in 226 practices in 116 towns, and it was found that 22 per cent. went to the doctor with respiratory disease (mainly bronchitis), 13 per cent. with digestive disease, and 45 per cent. with influenza, anaemia, skin disease, minor injuries and accidents, septic conditions, lumbago and rheumatism, and debility. Thus we know approximately 80 per cent. of the early morbid conditions met with in average insurance practice. What has preventive medicine to say to this group? Clearly, it should have more to do with them than with the ultimate causes of death. But taking both groups together, with the exception of cancer, they constitute the chief current burden of preventable mortality, sickness, incapacity, and "lost time" from the industrial point of view. This is now the unconquered territory. Preventive medicine has proved itself efficacious in the realm of infection; it must turn its attention to this larger issue, for it possesses the potentiality to deal with it also.

The problem before us at the moment is not the action the State should take in regard to these diseases, nor even the work of the medical practitioner, essential as they both are. It is the narrower engagement, How can the medical curriculum be permeated with the spirit and methods of prevention? I think the answer is twofold. First, by the teachers of medicine conducting the studies of their pupils in the direction of prevention (a) by a special course in hygiene and preventive medicine, and (b) by addressing themselves to the preventive aspects of clinical work; secondly, by the student bending himself to preventive study.

A COURSE IN PHYSIOLOGICAL HYGIENE AND PREVENTIVE MEDICINE.

The celebrated medical school in the University of Salerno possessed, as early as the twelfth century, a department of instruction in the basic subject of the Conservation of Health, and its sanitary precepts and principles have been handed down to us in the records and poems of the *Schola Salernitana*. Every British Medical School has

had something of this kind. But we do not make enough of it. It calls rather urgently for reform and amplification, partly as a definite and prescribed course in hygiene, and partly by the introduction into physiology and the clinical subjects of the preventive view. There should be a living and comprehensive short course in hygiene—not "drains" and nuisances, but the vital principles and means of health and the widest understanding of the physical effect of his environment and habits on man. We make the student, by special courses, familiar with anatomy and physiology that he may have the normal in his mind, and on that we build up his conception of disease. Why not start all his clinical work on a similar basis by providing a course in *Hygiene* of the normal body in action, and the factors which affect it? Again, *Medicine* proper should always and invariably include instruction in the prevention of disease of the respiratory, alimentary, circulatory, and nervous systems. There is a cause for all these morbid conditions, and Pasteur urged that the cause should be continuously sought and explored. *Surgery* likewise includes, and in some ways embodies in its most graphic form, the means of prevention; the removal of enlarged tonsils and adenoids, the correction of deformities, antiseptics, much abdominal and thoracic surgery, gynaecology, dentistry, industrial surgery, surgical reconstruction and re-education are examples which leap to the eye, but there are many others. *Obstetrics* should place in the foreground (and not in the background) the whole question of pre-natal supervision, puerperal fever, the prevention of congenital syphilis, ophthalmia, and the care of the infant, as well as the improved management of labour. What is really the scientific use and educational value of sending an inexperienced student to attend the confinement of a woman, whom he has never seen before, and of whose physical history he knows nothing? Is it only that he may count the case in the necessary twenty he must attend?

Even more important than the spirit of prevention pervading all instruction is the whole attitude of the student to his clinical work. I want him to ask himself, every time: "*Why is this patient here?*" What is the physical or social complex that has made his body depart from the normal? To what stresses and exhaustion has he been subjected? How did he get this thing that troubles him and me?" Certainly, it is not chance, caprice, or fate. It is our business and our science to worry out the causes, and discover the way to escape or remove them. If every student became thus an investigator and discoverer, the science and art of medicine would be saved from perfunctory workmanship, and from explanations which are no explanations, what Cullen used to call "the most absolute languor" leading to "exclusive attachment to one system." We ought to welcome light from any source, orthodox or heterodox, frequently question all our methods, and even receive cheerfully "the noise and bustling of Paracelsus." As Henry Ford of motor-car fame says, "Everything can always be done better than it is being done."

THE PHILOSOPHY OF PREVENTION.

The preventive attitude of the student cannot merely be left to opportunity. It must be provided for. In the first place, he should get a clear and fair "scratch line." He must know the physiological standard of health and capacity from which he starts. The preventive purpose of the course in anatomy and physiology is to teach him the range and capability of the human body, what Nature can and cannot do. "Our natures," said Hippocrates, "are the physicians of our diseases;" and, following him, in the Introduction of his *Medical Observations*, Thomas Sydenham, our grand exemplar in the seventeenth century, repeated the axiom: "Nature by herself determines diseases, and is of herself sufficient in all things against all of them." The study of biology, chemistry, and physics and the intermediate subjects, is to give an apprehension and standard of Nature which we may bring to the bedside. Without it we are lost, and prevention has no meaning. The natural history of disease is the crucial requirement. "When it is thoroughly grasped," says Sir Thomas Lewis, "that infection has more to do with heart failure than has strain or a mechanical defect in the heart itself

at all stages of the disease, in its initiation, in its development and in its progress, then and only then is the *natural history* of heart disease understood."

In the second place, the student must become really keen on the search for the etiology, the primary and secondary causes, of the morbid condition he is investigating. One frequently hears it said that the clinical student learns best by seeing a great number of cases, and that London with its immense population therefore affords fullest opportunity for clinical study. I am afraid I do not agree. Of course, the wider the experience the better; but it is not the superficial survey of many cases but the understanding investigation of a few which really educates the student. Comprehension and not repetition is the strength of memory; and it is obtained as the mind really explores and observes, and discovers for itself the causation of the condition. Nowadays we look for guidance (a) to bacteriology and pathology, (b) to clinical character and symptomatology, (c) to laboratory confirmation, and (d) to social factors. There is much new knowledge available, but 150 years ago at Edinburgh, William Cullen was proclaiming all the enduring principles, and his plan of studying each case has not been greatly improved upon by some modern prophets. Nevertheless, of course, he taught before the industrial revolution. The people had not swarmed into the towns (where four-fifths of them now live), the factory system was not dominant, industrial fatigue—a fertile source of physical and psychical impairment—was not appreciated, and the general stress and strain of modern life was less than now. Mr. G. M. Trevelyan tells us that the second half of the nineteenth century is "the story of the building up of the new world, of a wholly new type of society, infinitely more complicated and interdependent in its parts, more full of potentialities for progress or disaster, than anything the world has before seen," and this must be taken into account. Moreover, the growth of knowledge was awaiting Darwin, Pasteur,

Lister, Ehrlich, and Einstein. Hence, the actual and relative *causes* of disease were not evident. But now every inquisitive student can search with hopefulness, and be, as Cromwell said, "happy seeker, happy finder."

Lastly, the student should habituate himself to think widely and resourcefully of the means of prevention in their whole range. Poverty, industry, personal habits, social conditions, channels of infection, must be considered as well as the grand category of the therapeutics which prevent—drugs, vaccines, serums, organic substances, sunlight, electricity, radium, massage, psychology—and the still wider factors of environment. He is to learn by ingenuity to apply and adapt all knowledge to the harnessing of disease as a whole. The patient is to be cured; yes, but out of the patient is to be wrought an understanding of, and an attack upon, and the prevention of, the particular disease from which he suffers. It may well be that the student cannot *practise* prevention as he learns to practise the cure, for the issues raised are beyond his immediate control. But when he enters upon his life's work as a medical practitioner he will find that it is required of him that he shall take an essential part in the vast national and international machinery now in being for the conquest of disease. There are not less than a score of Acts of Parliament which impose public preventive duties upon him as a medical practitioner. He must know how to comport himself in relation to those laws. But more than that, his private patient is concerned not only with the alleviation of his malady, he is anxious about the future and his capacity to work, and he asks, "What can I do to *prevent* this?" Surely, that is a very cogent and penetrating question for the medical practitioner to answer. His answer, and its wide promulgation and proper interpretation, is the fulfilment of his splendid part as the missionary of Preventive Medicine. For his comfort he may remember that to prolong human life and make it fuller, better, and more effective, is the "master task of mankind."

THE TEACHING OF OBSTETRICS AND GYNAECOLOGY.

BY

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THE shortcomings of the old midwifery training must have been obvious to all those who, fortified by having recently passed an examination in anatomy and physiology, sallied forth into the outdoor maternity district to pick up, under no supervision whatsoever, what they could of the practice of midwifery under the worst possible conditions. Lamenting past deficiencies will, however, serve no useful purpose and time and space will be better occupied in describing present methods and ideals, so far as can be done by one teacher, speaking on behalf of many.

NEW AND WIDER VIEWS.

A beginning may be made by outlining the changed view of what is included under Midwifery and the Diseases of Women. Though the title is double, the subject is not: it is the study of normal and abnormal reproduction and the diseases of the reproductive tract in women, and it cannot be taught in two separate pigeon-holes as obstetrics and gynaecology. It must be presented to the student from the aspect of preventive and curative medicine—midwifery representing chiefly the preventive and gynaecology the curative and reparative side—and the more the subject can be widened to include an outlook over the whole reproductive cycle—from one generation to the maturity of the next—the more educative will it be.

Training in midwifery cannot be expressed merely in terms of attendance on labour, within and without the hospital, but must include all the machinery of what is commonly termed a maternity centre. Pregnancy, labour, lying-in, and lactation are physiological states and in all of them our primary object is the maintenance of the physiological and the avoidance of the pathological. The physiological study of reproduction is, therefore, the essen-

tial foundation on which practice must be built, and no opportunity must be lost of interesting the student in all phases of the normal functioning of the reproductive system. In the ante-natal clinic he will be taught the observation and care of the pregnant woman with the object of detecting and remedying any deviation from the normal. For the first time in his training the student sees patients, of whom the vast majority are not ill, in order to pick out occasional cases in which trouble may be brewing or may be feared in the future. He will learn the examination of women in all stages of pregnancy, and the warning signs that enable its disorders to be detected early and preventable difficulties in labour forestalled. In the wards the investigation and treatment of the more serious diseases of pregnancy will be carried out with the help of biochemical and other laboratory methods, and the conduct of labour learnt first in the maternity ward, under the best conditions, with all the resources of the hospital at hand. The birth itself will not be taken as the "be-all and end-all" of midwifery, but as a stage in the reproductive process and a critical one calling for special care. The management of the puerperal woman and the nursing mother and her infant will likewise be followed with the same object of keeping healthy patients in health, and observing the physiological processes of involution, lactation, and the early development of the child. The follow-up of mother and child throughout the period of lactation in the infant clinic is the natural corollary of this part of the work.

The diseases of the reproductive tract are largely represented by (1) infections, due to gonorrhoea and puerperal sepsis, (2) mechanical lesions resulting almost entirely from injury at childbirth, and (3) new growths. Of these the first two are preventable and should be presented first to