THE STUDY OF CHILD HEALTH*

BY

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A great change has taken place in the standing and importance of the subject known under the various names of paediatrics, child health, and child medicine. It has advanced from being a somewhat insignificant section of medicine to become one of the major subjects of medical education; in many universities it joins medicine, surgery, and obstetrics in forming the four subjects of the final examination.

The welcome recognition of the importance of paediatrics by universities and by the General Medical Council has been the result of an educational campaign carried on for many years by the British Paediatric Association. The association gave evidence before the Goodenough Committee on Medical Schools, which in its report, published in 1944, said: "Generally in the medical schools in Great Britain the teaching about children has been inadequate and only a faint interest has been taken in the subject. The inadequacy has been due in fact to the lack of facilities for the study of the subject . . . if the place of paediatrics in the undergraduate course is to be assured, adequate recognition must be given to the subject in the final qualifying examination." Previous to the issue of this report it had often been stated by university authorities that even if academic and clinical facilities were made available for the teaching of this subject an examination would be unnecessary. I understand that the Scottish student will pursue knowledge for its own sake and without any hope of a reward. I do not know the attitude of mind of the Welsh student, but I do know that many English students have a short-sighted and completely utilitarian approach to this problem, and will not attend classes if there is not an examination in the subject concerned.

Although the present standing of paediatrics in our universities is a matter for congratulation, many of us have a feeling of shame that it has taken us over 100 years to follow the example of Sweden. On May 2, 1845, the paediatric clinic of the Royal Caroline Institute, Stockholm, was opened under the charge of Dr. Berg, the first professor of paediatrics; and every medical student was obliged to attend the course of instruction given by Dr. Berg, and an examination in the subject was compulsory.

This action by the Swedes was the result of a memorial prepared in 1842 by the professors of the Caroline Institute in which they stressed the difference between disease in infancy and that in adult life and the need for a clinic for children. As the greatest living Swedish paediatrician, Professor Wallgren, has said: "The words in which this memorial was couched heralded the dawning of a new day" in Sweden. In this country it was another nine years before, in 1851, the first children's hospital was opened in Liverpool, followed a year later by one in Manchester and one at Great Ormond Street, London.

*An abridged version of an address given at the opening of the Department of Child Health of the Welsh National School of Medicine at Llandough Hospital, Cardiff, on October 12, 1950. This was received for publication after Sir Leonard Parsons's much-regretted death on December 17, 1950.

Association with Obstetrics

Instruction in diseases of children was originally given by teachers of obstetrics, whose chief interest was in infants, but who, even so, were rightly more concerned with the mother than with the baby. The close association of paediatrics with obstetrics is of the greatest importance, as both during pregnancy and in the early months of infancy the mother and child are one biological unit. Paediatricians and obstetricians therefore must work in a close partnership, the paediatrician advising on the care of the foetus and child and the obstetrician caring for the mother. Only in this way can the present stillbirth and neonatal mortality rates be reduced to their proper proportions. Although here I am primarily concerned with the specialist, the same happy combination can and should exist between the general practitioner and the child-welfare medical officer, and the general practitioner can himself combine both roles.

It is interesting to me to realize that the first independent lectureship in children's disease was instituted in 1857 by my own medical school. This occurred before there was a children's hospital in the town. I do not know the reason for the appointment nor why, in 1868, it lapsed for a period of nearly 50 years. Manchester in 1881 was the next medical school to appoint a lecturer, and various others were appointed from time to time until 1932. The first paediatrician to be accorded professorial rank was Sir Frederic Still in 1906, but his position was only a titular one, as he was without any proper academic department. In those early days there was no question of co-operation with public health departments; nevertheless, I would like to put on record the fact that the resuscitation of the lectureship in 1915 in my own university—to which I was appointed—was due to the advocacy of a great medical officer of health, Sir John Robertson. At that time he was professor of public health, and he insisted that the title of the lectureship should be "Infant Hygiene and Diseases of Children." He was thus one of the pioneers, if not the actual pioneer, of the association between preventive and curative paediatrics.

Preventive Paediatrics

Preventive paediatrics was at first largely a voluntary effort, and its present position is chiefly due to the introduction of the school medical service, the creation of a Ministry of Health, and the foundation of the child welfare service. This series of events has been fraught with great benefits for the children of this country, but for many years it produced a great cleavage in paediatrics. Revelation is perhaps a better word than cleavage, because the development of these services revealed to many hospital paediatricians and general practitioners their neglect of a great part of paediatrics, that, in fact, they were concerned only with the child when ill and had little or nothing to offer in the way of advice on the upbringing of the healthy child or of the measures to be taken to maintain its health.

The development of these services, as we know only too well, resulted in the creation of two types of paediatrician: the one concerned with preventive paediatrics and who has little experience of curative work, and the other with considerable experience of curative and little experience of preventive paediatrics. This state

of affairs still exists, but happily it is being remedied largely by the creation of child health departments.

Twenty-five years ago I first visited Canadian and American paediatric centres. I said at the time, and I have never changed my opinion, that the paediatric department of Toronto was the best in the British Empire. I saw there, for the first time, that co-operation between preventive and curative paediatrics and between the public health and hospital authorities of which I had dreamed but which so far had indeed proved nothing but the "baseless fabric" of a vision. A municipal health visitor attended each out-patient department, heard the instruction given, and later visited the child's home to see if these instructions were being carried out. If a child did not attend the out-patient department when it should do so, a message to the public health department ensured a visit to the child's home to find out the reason. The milk kitchen of the hospital supplied special foods to children in their homes; the municipality provided a preventorium for child tuberculosis contacts which was staffed from the children's hospital, and this before we were familiar with the primary complex. The hospital also supplied consultant services to the infectious diseases hospital. In many other ways there was the most complete link between the municipal authorities and the hospital, which were closely united with other university departments both geographically and spiritually.

Child Health Institutes

On my return I tried, but without avail, to persuade my university to create a chair of paediatrics and to link up with the public health department. Three years later I was made a professor and also consulting physician to the municipal babies' hospital; but no closer connexions with the municipality occurred, although a further attempt was made in 1929. I consulted the late Sir George Newman, thinking at that time that the Chief Medical Officer to the Ministry of Health could direct municipalities to pursue a certain course, but I soon learned how mistaken I was. A third unsuccessful attempt was made shortly after war broke out; but in my wartime capacity as hospital officer I came into close contact with chairmen of public health committees and medical officers of health, and eventually in 1946, 21 years after my first effort, a scheme was agreed to whereby the university, the local authority, and the children's hospital united to form a child health institute. The scheme might perhaps be taken as a broad pattern for other child health departments, but details would obviously have to be modified to fit the particular university, board of governors, and regional board concerned. Up to the present all existing child health institutes are spiritual rather than material entities because there are no actual institute buildings. When an institute can be built in Birmingham it is hoped to erect it on land near the children's hospital, and it will become the headquarters of preventive paediatrics just as the hospital is the headquarters of curative paediatrics.

The child welfare, school medical, tuberculosis, and mental deficiency services have all been linked up with the university department, and certain members of the staffs of these services are university lecturers and certain others are clinical assistants at the hospital. The professor of paediatrics is consulting physician to the city child welfare service, and the registrars undertake duty as child welfare and school medical officers. In

addition one of the hospital physicians conducts a consultative child welfare clinic in the city's largest child welfare centre.

University Child Health Department

It is obvious that although such a scheme confers great benefits upon both the university and the local authority it is limited in its scope because it is confined to the university town. Clearly, therefore, subsidiary child health institutes are required in other large towns in the region, and these should have a close connexion with the university. The professor and his chief assistants should pay regular visits to these outlying centres, and the people working in them should have access to the university department; there should also be an interchange of registrars. The board of governors of the teaching hospital and the Birmingham Regional Hospital Board have recently laid down as a condition of appointment of registrars that they must be prepared to work in other centres as well as the one to which they are primarily appointed. It is hoped by this means to effect an interchange of registrars between the teaching and the regional board hospitals. I notice that the Ministry has now recommended the general adoption of this procedure. There may sometimes be difficulties in this interchange, when, for instance, the outlying centres are a long way from the university town or if the registrar is married and has given hostages to fortune in the shape of children and ownership of a house; but in many instances a way can be found to overcome or minimize these difficulties.

Visits to outlying centres, the necessary administration of his department, and attendance at innumerable committees will consume a great part of the professor's time, but expenditure of time in this way seems unavoidable in the present structure of the Health Service. It is therefore essential that he must be assisted by an adequate staff; a staff which in the old days would have been beyond the bounds of our imagination. In addition to a number of consultant paediatricians it is necessary to have the help of skilled laboratory workers, pathologists, biochemists, etc., and, whilst in a general hospital these can be shared with other departments, there are advantages in having people specially trained to appreciate the paediatric standpoint. Such a university child health department will of course require a considerable income in excess of the normal cost incurred by the hospital in carrying out its primary duty—the care of the sick child. If staffed by whole-time officers this extra cost may reach £10,000 a year, a figure which has been accepted by the university grants committee. Where there is a close link-up with the local authority, such as I have suggested, it is reasonable to expect from it a substantial contribution to these running costs—as is done by the City of Birmingham.

Training in Paediatrics

Whilst the primary duty of such a department is the care of the sick child there should also be organized research into the cause, cure, and prevention of illness and the study of methods to ensure optimum health among the child population. In addition the university department of child health is responsible for the teaching of undergraduates and postgraduates. The standard of child health and the treatment of the sick child cannot be improved by any quicker or better method than by the adequate training of medical

students. This will ensure that the country possesses general practitioners who at any early stage in their career are capable of giving sound advice about healthy and sick children. In years gone by many practitioners have displayed little interest in the promotion of child health, and those who were interested had to a great extent to educate themselves.

According to the Goodenough Committee the teaching of paediatrics can best be developed "along the lines that child health and children's diseases constitute an important part of the training in general medicine and to a lesser extent in surgery, and that, in addition to a relatively intensive training in the subject, teaching on the health and diseases of children should run like a golden thread throughout the whole of the curriculum." Your new department will provide this intensive training and will, I feel sure, be able to count in particular on the departments of anatomy and physiology in carrying out the advice of the Goodenough Committee. It seems to me that it is wise to link together teaching concerning the function of an organ with its structure in order to show how, in the developing embryo, infant, and child, form waits upon function and function frequently dictates structure.

Paediatrics should also be a part of the transitional course which now intervenes between the preclinical subjects and full clinical studies. In this course the student should be informed of certain matters of which I have already spoken; in particular he should realize that to understand the natural history of many diseases he must study them in children, and he must also be instructed concerning the great importance of adequate nutrition and of environmental conditions in childhood. It seems to me that in no other department of medical study can curative, preventive, and social medicine be so intimately linked together and achieve such outstanding results as in the department of child health.

I have already stressed the close association which should exist between obstetrics and paediatrics: instruction on the care of the newborn child must form part of the intensive training of every medical student. Other aspects of this intensive training are clinical clerking, and attendance at child welfare, school medical, child guidance, and tuberculosis clinics, and at a mental deficiency institution. In the period of clinical clerking I hope it will be possible to carry out the suggestion of the General Medical Council and arrange for each student to reside in hospital for a period of four weeks. The condition of sick children, and particularly of sick infants, may change so rapidly that unless the student has the opportunity of observing these changes he will often be completely at sea when called upon to treat sick infants in his private practice.

The size of the department should bear some relation to the number of students, as each student should have at least four children under his care. The University Grants Committee thinks that a professorial unit should contain not fewer than 60 beds; beyond that figure the number of beds required depends entirely on the number of children needing in-patient treatment and the number of students. It is an ideal condition for the teaching of medical students and student nurses that the beds used for teaching should be all or nearly all in one institution.

In addition to clinical teaching some systematic teaching is necessary, and this is perhaps best achieved by a system of tutorial classes or seminars. This system

not only allows more intimate association between teacher and student, but also spreads the burden of instruction between the professor, his assistants, and the registrars. Some teachers think that such instruction should take the form of set lectures. This may be true if the lecturer is really good, but I am sure the other system is better, although an occasional lecture on general topics by the professor or some other member of his staff, or by a visitor, is stimulating both to teachers and to students.

Recent Trends

So much for the changes which are taking place in the status and teaching of paediatrics; but, as in other branches of medicine, changes are continually occurring in the subject itself. In fact, paediatricians now talk a different language from the one which they spoke even ten years ago. A few specific examples will illustrate this trend.

When a resident at Great Ormond Street Hospital I was greatly interested in pyloric stenosis of infants, but when I started practice in Birmingham in 1910 my colleagues told me that the disease did not exist in that city. This statement was of course soon disproved, but prior to 1919, when the first Rammstedt operation was performed at my hospital, the death rate from the condition was 80%. The introduction of that operation reduced the mortality to 50% between 1919 and 1923. A very different state of affairs exists now. In a series of 102 cases treated in 1946 there was not a single death, and in 1948 out of 105 cases there was only one death; and the frequency of the condition seems to have increased to such an extent that over 100 cases a year are admitted to hospital. This remarkable change is due to some extent to improved surgical and anaesthetic technique, but much more has been accomplished by improved pre-operative and post-operative care and prevention of infections among hospital babies. Moreover, as a result of better medical education there is now a greater awareness of the disease among general practitioners; this leads them to recognize it before the baby has become a wasted infant.

Before the late war diphtheria was said to be the commonest cause of death among children of school age, but now, as the result of the immunization campaign started during the later years of the war, deaths from diphtheria are approaching negligible proportions and its incidence has greatly diminished. The control of diphtheria ranks with that of smallpox as the greatest triumph of preventive medicine in our country.

Antibiotics, which daily increase in number and potency, have revolutionized the treatment and symptomatology of infectious diseases, and in some instances their efficacy has even extended to virus disorders. They have brought the brightness of hope to the parents of children suffering from tuberculous meningitis when previously there was nothing but unmitigated gloom; and mastoiditis, once so frequent and so often fatal, is now infrequent and has been stripped of most of its terrors. Antibiotics are so marvellous in their action that frequently they are given when a child has a temperature, before any diagnosis has been made, and indeed they often prevent a diagnosis ever being made. In this way the practitioner may be tempted to become careless and not try to solve the problem set before him. Even so, on balance there is no doubt that the patient is better off than when more care was

taken to diagnose the disease but there were less efficacious means of combating it.

In addition to antenatal paediatrics and the care of the newborn and premature infants perhaps the most recent general trends in paediatrics in the United Kingdom are the adoption of the Gesell technique in the study of the development of the baby, and an assessment of the pattern of growth by such means as the Wetzell grid and the Tuxford index. These are attempts to decide the normal; but what is the normal?

A good knowledge of the abnormal, especially in its minor degree, is important for a knowledge of the normal, and therefore a wide experience of curative paediatrics is essential even to those engaged in preventive paediatrics. Most of the data which we now accept as normal—particularly, for example, in regard to heights and weights at various ages—are averages and not normal. Normality usually covers a wide range, but if there is an optimum level which can be obtained it should surely be regarded as normal. An excellent example of the point I am trying to make is found in the haemoglobin values of babies. Helen Mackay and others have shown that the values which we had previously regarded as normal could be raised, particularly in artificially fed infants, by adequate supplies of iron, and could even be improved by giving iron to pregnant women. Children with this higher level of haemoglobin were found to be better nourished and to stand infections better than those not given iron. Therefore it seems to me that this optimum figure ought to be regarded as normal.

Conclusion

Whilst composing this address I was on holiday in North Wales, and during a walk on a fine day I was entranced by the effect of sunlight and shade on the mountains in contrast with the complete shadow of the foreground. The country in the foreground was lovely, but in the sunshine the loveliness was greatly enhanced, the colouring far more attractive, and the whole effect wonderfully different. It seemed that here was an analogy which explained my ideas: the foreground was the "average," and the sunlit landscape the "optimum." Only the "optimum" is good enough for our children, and this should be the goal for which we strive. Actually, I think we are in process of achieving it, because children in all classes of society are obviously more healthy and better nourished than they were before the war. For this change the health services and paediatricians deserve a greater share of praise than politicians, and the latter a much smaller share than they are wont to arrogate to themselves.

H.M. Hospital Ship *Maine* was the only hospital ship on the Far East station at the outbreak of war in Korea, and until October, when she returned to Hong Kong, she was engaged in evacuating wounded and on general hospital ship duties. The 7,514-ton *Maine* was formerly the Italian *Leonardo da Vinci*, and was converted into a hospital ship in 1943. In March this year Denmark sent the 8,500-ton *Jutlandia* to Korea. She carries 16 doctors, 40 nurses, and 25 medical aid men, all of whom are volunteers. There are four specially designed operating-rooms, and 300 surgical cases can be handled; many of the complicated cases from Korea will be sent to the ship for treatment. The beds are fastened on rockers so that they remain level when the ship rolls, and extra wide beds have been installed for fracture cases.

Preparations and Appliances

APPARATUS FOR SCALP VEIN TRANSFUSION

Dr. J. J. KEMPTON, paediatrician, Royal Berkshire Hospital, Reading, writes: The new design of needle described below has seemed to have some advantages over previous apparatus for transfusion by scalp vein.

The scalp vein needle consists of a small flanged mount, a needle shaft 11/16 in. (1.75 cm.) in length, with a 45-degree bevel point, and a short tapered shaft on the proximal end of the mount, to which polythene tubing is connected. The under side of the flanged needle mount is shaped to lie flush on the infant's scalp while the needle is within the vein, and may be secured in position with adhesive strapping. A set of three needles of 24, 25, and 26 B.S.W. gauge provides a choice equivalent to hypodermic-needle sizes Nos. 15, 16, and 17.

The side branch stopcock is equipped with a polythene tubing adaptor which grips the wall of the tubing by compression of a rubber gland. A screw mount on the proximal end of the stopcock ensures a secure attachment to the syringe, which is of the three-finger-ring type with a screwed nozzle for mounting the stopcock. Both the syringe and the polythene tubing adaptor are similar to those described in connexion with exchange transfusion apparatus by Dr. John Henderson (*Lancet*, 1950, 2, 291).

A length of polythene tubing is mounted on the tapered shaft of the needle and connected to the stopcock by means of the screw-on polythene tubing adaptor. The tubing from the standard blood-transfusion-giving set is connected to the side branch of the stopcock, and the stopcock is screwed on to the nozzle of the syringe, which is of either 10-ml. or 20-ml. capacity. Blood can be seen to enter the polythene tubing when the needle has entered the vein; the syringe is then filled with blood from the giving bottle and injected into the scalp vein of the infant. At the outset, needle and tubing contain saline.

By the above means flexibility is achieved between the infant and the syringe, and the necessity of holding anything more than the scalp vein needle against the infant's scalp (such as a Kaufman syringe) is overcome. At the same time polythene tubing provides an excellent window through which blood can be seen immediately the needle is passed into the vein, and air bubbles are similarly readily detected.

Saline infusions may be given by the gravity drip method, using the components described, but in this case the syringe and stopcock can be discarded in favour of a simple polythene tubing adaptor equipped with a female Record tubing mount.

The apparatus has been made for me by Edwards Surgical Supplies Ltd., 83, Mortimer Street, London, W.1.