B.M.A. Lecture

ON

MIDWIFERY IN THE HOME *

BY

THOMAS WATTS EDEN

M.D.ED., F.R.C.P.LOND., F.R.C.S.ED., F.C.O.G.

An interesting feature of midwifery practice at the present time is the willingness, or often the eagerness, of women to enter a hospital for their confinement. This attitude is a comparatively recent development, and arises no doubt from the growing confidence of the public in the work of our hospitals. Yet, the proportion of confinements which take place in hospitals or other institutions—that is, which take place away from home—is small if we view the country as a whole. In rural districts the proportion is very small indeed. In the city of Cardiff the proportion is relatively high—namely, 15 per cent. Hospital accommodation for midwifery is admitted to be inadequate over the country as a whole, but the task of increasing the available accommodation is expensive and progress is slow; in all probability, at least 75 per cent. of our women will be confined in their own homes for many years to come.

There is much to be said for the view that it is better for the average normal mother to have her baby at home, so long as the home conditions are decent and good medical and nursing attendants are available. The case which can be recognized as abnormal during the ante-natal period is better dealt with in hospital, except in respect of the small minority whose social circumstances allow them to command specialist services when required. Statistics showing the results of domiciliary midwifery are not easy to obtain, but there are at any rate two sources of information available which deserve attention. One is the outdoor practice of the lying-in hospitals and the midwifery departments of general hospitals; the other is the practice of the midwives belonging to the Queen's Institute of District Nursing, who work for nursing associations in various parts of the country.

May I first of all remind you of the figures of our national maternal mortality, which is the cause of so much public concern at the present time. Table I gives the essential features and the alteration they have under-

TABLE I.—Mortality per 1,000 Live Births

Year	Sepsis	Other Causes	Total
1911-15	1.42	2.61	4.03
1916-20	1.51	2.61	4.12
1921-25	1.40	2.50	3.90
1926-31	1.72	2.52	4.26

gone during the last twenty-one years. The figures given are average figures for the five-year periods, and they refer only to England and Wales.

It is especially to be noted that during this period the total mortality has shown no improvement, a small but sustained fall in column 2 being more than counter-balanced by a rise in the mortality from sepsis.

Taking the country—that is, England and Wales—all over, great inequalities appear in the maternal mortality rates of different localities. In the counties the rate in 1931 varied from 9.83 in a certain Welsh county to 1.98 in an English county. In the county boroughs the rate

varied in the same year from 9.69 in a Yorkshire manufacturing town to 1.21 in an English town devoted to the brewing of beer. These very wide variations are difficult to account for. A special inquiry recently undertaken by the Ministry of Health into the causes of the persistently high mortality in Lancashire, the West Riding, and in Wales has not succeeded in elucidating what is clearly a very difficult problem.

ORGANIZED DOMICILIARY MIDWIFERY

The results which can be obtained from organized domiciliary midwifery may be seen in the work of midwives employed by the Queen's Institute of District Nursing, or, as it was originally called, the Queen Victoria Jubilee Institute of Nurses. A communication dealing with their work up to and including the year 1925 was published in the *British Medical Journal* of January 8th, 1927, by Dr. J. S. Fairbairn. For the following particulars I am indebted to Miss Wilmshurst, the general superintendent of the Institute.

These midwives, who work not privately, but exclusively for county nursing associations, attend large numbers of women in different parts of the country, the total number attended having reached 66,000 for each of the last two years.

Table II shows that during each year of the period 1926-31 the total maternal mortality of the cases attended has been remarkably low, considerably less than one-half of the national maternal rate. What is even more striking

TABLE II.—Midwifery Results of the Queen's Institute of District Nursing

Year	Cases Attended	Total Mortality per 1,000	Mortality from Sepsis per 1,000	Proportion of Cases in which a Doctor was Called
1926	56,868	1.50	0.26	19.0 per cent.
1927	53,502	1.30	0.70	25.0 ..
1928	65,077	1.90	0.44	25.2 ..
1929	63,131	2.10	0.63	28.4 ..
1930	66,003	2.00	0.53	27.6 ..
1931	66,570	1.70	0.46	27.0 ..
Average of six-year period, 1926-31 ... }		1.75	0.42	—

is the very low mortality from sepsis among their cases, which during the same period averaged only one-quarter of the national sepsis rate. These midwives appeal freely to doctors for assistance, and the proportion of doctors' consultations is steadily rising. During the last five years medical aid has been obtained in 25 per cent. or more of the cases attended by them. They have no special claim on hospital beds, and comparatively few of their cases are, in fact, transferred to hospitals. In compiling their statistics of mortality I am informed that all cases attended by them and subsequently transferred to hospital, or to a doctor's care, are included.

During 1931 the Queen's Institute had 3,775 midwives working for it in various parts of the country under the county nursing associations. Less than one-fourth of these midwives are fully trained registered nurses (S.R.N.); the remainder are women who have been trained as midwives, and in addition have received six months' instruction in district nursing, to enable the village midwife to do a certain amount of general nursing in addition to her proper midwifery work. A very large proportion of the work is, in fact, done in villages and in industrialized rural districts remote from hospital facilities and from specialist obstetric assistance. From

* Delivered to the Cardiff Division on December 15th, 1932.

this it is clear that the midwives employed by the Queen's Institute are somewhat better trained than the average midwife, but, on the other hand, the village nurses work under the disadvantage of having to do general nursing as well as their own proper work.

Other examples of organized domiciliary midwifery are offered by the outdoor services of our maternity hospitals, and to one of these I wish now to call your attention.

The East End Maternity Hospital of London has recently published returns carefully compiled by its medical officer, Dr. W. H. F. Oxley, covering the five-year period 1925-29.¹ About 2,000 cases were attended annually; roughly one-third were attended in their own homes, the remainder were admitted to the hospital. Of the primiparae 82 per cent. were confined in the hospital; the multiparae in about equal numbers at home and in hospital. The total maternal mortality during this period over both home and hospital work was surprisingly low—namely, 0.48 per 1,000 births—which does not greatly exceed one-tenth of the national rate for the same five years. The proportion of abnormal labour is very low indeed, and this is attributed mainly to the thoroughness and efficiency of the ante-natal supervision which all the patients receive. The conditions in which this hospital works are unusually favourable, inasmuch as the patients all live near the hospital, and hospital accommodation is freely available, not only for all difficult cases, but also for the great majority of the primiparae. The actual attendance at labour, whether in the hospital or in the home, is mainly in the hands of midwives and pupil-midwives, but expert medical assistance is instantly available in case of need.

These two examples serve to show that the national figures are capable of great improvement without any revolutionary change in the English system. If similar results could be achieved in all parts of the country the problem of maternal mortality would at once take on a very different aspect.

The main features of the work of the two institutions we have been examining are: (a) attendance at confinements by trained midwives; (b) prompt resort to medical advice and assistance. These conditions, if not everywhere available at the present time, are becoming more and more widespread every year.

I have been interested to find, from a study of the report of the M.O.H. for Cardiff, that the conditions under which the great majority of the confinements take place in this city show the same general features as we have just been considering. Thanks to the admirable liaison which has been established between the local authority, the Medical School, and the Royal Infirmary, there is adequate hospital accommodation, and the highest medical skill has been made available for the working-class patient.

When I went into another point, with the kind assistance of Dr. Picken, it appeared that in the city of Cardiff in the year 1931, out of a total of 3,961 births, there were only from 25 to 30 per cent. in which a medical practitioner was primarily engaged. I believe that much the same state of affairs may be found in most of the large industrial centres in England, and it appears that already the great bulk of the midwifery service of the industrial classes is being carried out by midwives, the general practitioner acting as consultant at first instance to the midwife. It is more than likely that the midwifery service of the country will gradually be built up on this basis; not, perhaps, as a formal national scheme—that is not the English way—but rather by progressively taking shape, as step follows step, until one day we shall realize that we are in possession of a national maternity service without knowing quite how we got it.

RISKS OF DROPLET INFECTION

It is worth while to observe that the outstanding results we have been noticing have been obtained by the use of such simple antiseptic methods as can be carried out in the average home of the industrial classes. On the other hand, these are exceptional results, and we must give due consideration to the authorities who are now so strongly urging the adoption of a more elaborate antiseptic technique. It is urged that this is necessary to meet the recently discovered danger of droplet infection by carriers of the haemolytic streptococcus. It must be recognized that the theory of droplet infection has now been fairly established. Briefly the theory postulates that an individual—for example, a nurse, a doctor, or the patient herself—may be unconsciously a carrier of the haemolytic streptococcus in the throat without presenting any local symptoms at all. These organisms are expelled from the mouth in the fine spray of saliva which is emitted in talking, coughing, or sneezing; they may then fall upon the hands, instruments, or dressings, and so be carried into the genital canal, where they are likely to set up a severe form of sepsis. The theory has been proved by showing that the particular strain of streptococcus from the septic patient is identical with that taken from the throat of one of the attendants or possibly of the patient herself, and this has, in fact, now been done in a sufficient number of cases and by different expert observers. There seems to be little doubt that here at last we have stumbled upon the explanation of the baffling case of the woman who becomes septic although no vaginal examination was made during or after labour. These used to be called cases of "auto-infection," but recent research suggests that infections which are set up by organisms present in the genital canal at the time of labour are almost invariably of a mild type, and are due not to haemolytic streptococci, but to another variety—the anaerobic streptococci. These organisms can, in fact, be found frequently in the vagina in pregnancy under apparently normal conditions, and are then non-virulent; after delivery, however, they get their chance of propagation under different conditions, and they then may invade the uterus.

It will be at once obvious that the risks of droplet infection will be greatly increased if one of the attendants is suffering from tonsillitis or other form of sore throat, or from nasal discharge. It has, of course, long been recognized that purulent discharge from the ear or from a finger may be an active source of infection, but in these instances the infection is carried in a different way—that is, by direct contact.

This question of droplet infection has now reached a stage at which strong representations are being made that measures specially designed to meet the risk should be generally adopted in midwifery practice. The final report of the Departmental Committee on Maternal Mortality and Morbidity, issued last summer, contains a scheme of antiseptic technique which is advocated as suitable for adoption into general practice, and which would afford protection against droplet infection. The committee has evidently been considerably impressed by the fact that in the series of 4,655 puerperal deaths which were the subject of inquiry by it, 18 per cent. of the fatalities were cases of sepsis following normal labour. Such deaths result from failure to prevent infection of the genital tract under conditions which present no special obstetric difficulty, and they must be looked upon as obstetric calamities of the gravest kind. It is clearly incumbent upon us to omit no precaution which advancing knowledge indicates as necessary and which experience proves to be efficacious. That complications of labour should take a certain toll

of victims will probably always be inevitable, but it ought not to be beyond our power so to conduct the normal process, in women of average good health, as to eliminate the risk of the occurrence of fatal septic infection.

ROUTINE ANTISEPTIC PRECAUTIONS

The relative frequency with which this failure occurred in its series had, one surmises, a good deal of influence in leading the Departmental Committee to the point of recommending considerable stiffening of our routine antiseptic precautions.

The antiseptic technique recommended by the Departmental Committee may be briefly passed in review. It says, to begin with, that "the present-day practice of midwifery cannot be relied on to . . . keep the vulva and perineum as far as possible free from pathogenic bacteria" (p. 111). It advises: (1) That the vulva should be shaved or the hair closely cut. (2) The vulva should be washed with coal-tar soap, or some other antiseptic soap, using either boiled water or water sterilized by the addition of 1 drachm of a 2 per cent. iodine solution to a pint. (3) All instruments used should be boiled shortly before use, and allowed to remain in the boiled water, or be wrapped in a sterilized cloth. (4) The hands and forearms should be scrubbed for five minutes with coal-tar soap and iodine water, and then soaked for two minutes in a 1 in 1,000 aqueous solution of biniodide of mercury. (5) Previously sterilized gloves should then be put on wet out of the water in which they have been boiled. (6) Frequent re-sterilization of the gloves, after contamination, can be effected by simply washing the gloved hands in soap and iodine water and then immersing them again in the biniodide solution. (7) "Droplet infection can be countered to a large extent by the use of efficient masks"; "These should be worn over both mouth and nose by all in attendance upon the patient, and by any other person present"; "A piece of impervious material, such as paper (or mackintosh), about 4 inches square, should be incorporated in the mask"; "The use of these masks should not be limited to the time of delivery; they should be worn whenever any local treatment is carried out"; and, lastly, the warning is added, "If the masks are touched by the wearer they may be more a danger than a safeguard."

No one can question the soundness of the scientific basis of this technique, but it must be admitted that the practical use of the mask has not yet been subjected to the extensive tests which are necessary before it can be said to be practically efficacious in diminishing the risks of infection.

After its use has been thoroughly tried out in hospitals, and in the outdoor practice of hospitals, we shall be in a better position to judge of its practical efficiency. It cannot too strongly be emphasized that in order fairly to test the use of masks they should be worn by every attendant, not by the doctor only. Whenever he or anyone else present is suffering from a sore throat the risk of infecting the patient is then much greater; and the reasons for using the mask are accordingly more urgent.

The more our knowledge of the causes of puerperal infection grows the more complex and difficult does the problem of protection appear to become. The public mind is now thoroughly aroused as to the grievousness of our high national maternal mortality. It is not questioned that the intensive propaganda of the last ten years has been useful, and was necessary; it has, however, placed us in a somewhat awkward predicament, because while the medical profession is anxious to inculcate the view that pregnancy and labour are natural processes, necessary to a woman's full development, the

public are being warned by louder voices than ours of the dangers which attend those natural processes, and of the failure of doctors to devise effective measures to combat them. A good deal of uneasiness in the minds of many prospective mothers has undoubtedly arisen in consequence.

An elaborate technique has its disadvantages, and we must not overlook the fact that it has been shown that with the simple methods in common use to-day it is possible to reduce the incidence of infection much below its national level. The Queen's nurses, whose results have been referred to, do not adopt an elaborate technique. I am informed that only during the last year have masks been used at all, and then only in exceptional cases; nor is the use of sterilized gloves by these midwives compulsory, although gloves are, in fact, in common use by the district midwives, who also are responsible for a certain amount of general nursing. Yet the low rate of mortality, and in particular the low rate of infection, shown by their cases is very striking. In the practice of the East End Maternity Hospital referred to above neither gloves nor masks were used during the period under review.²

All obstetric operations, however trivial, undoubtedly call for full observance of all the details of complete surgical asepsis, and if I may be so bold as to put my own view to you, it is that a practitioner who carries out, for example, a forceps operation under conditions short of full surgical asepsis is assuming a grave responsibility. Yet it must be admitted that there may, on occasions, be no alternative before him but to accept that responsibility; that is to say, it may be the less risky of the possible alternatives.

ANTE-NATAL SUPERVISION

Our results in domiciliary midwifery will clearly be influenced very largely by the degree of success we achieve in recognizing the abnormal case and in making timely arrangements for it. And in this connexion I want to make a special appeal to the members of the Cardiff Division who are general practitioners. I said earlier that I thought that things were developing in such a way as to make the general practitioner the consultant at first instance in regard to the great bulk of midwifery practice. If this should prove to be true his position will be not only a more honourable but also a more responsible one. I was interested to notice that during 1931 a sum of £1,207 was paid by the city of Cardiff to practitioners for consultant services in midwives' cases. But may I respectfully remind you that the ability to render such consultant services depends upon the possession of special knowledge and aptitude, and these are not inborn qualities; they can only be acquired by work and by training. If the practitioner is to play a more responsible part in the midwifery service of the country than he has hitherto played he must fit himself for this added responsibility. Possibly a process of natural selection will bring forward those practitioners to whom midwifery appeals, and who have accordingly made of it a special study.

I want to illustrate my conception of the work by a reference to ante-natal supervision. It is beginning to be recognized that the widespread ante-natal work which is now being carried on in clinics and privately has up to the present made no impression whatever upon national maternal mortality. This is a great disappointment, for strong hopes of improvement were built upon it. It is, however, open to question whether ante-natal supervision has as yet received a fair trial. The doctor's part in ante-natal work requires not only a sound practical knowledge of midwifery, but also a wide acquaintance with practical medicine. It is essentially work for the practical

man with wide clinical experience. If at this point I seem to be criticizing public health authorities let me say that I recognize fully that municipal ante-natal clinics have to be run by the best persons available to run them, and it is unreasonable to criticize them upon that score. Yet it remains true that ante-natal work inefficiently performed may do almost as much harm as it does good. Even the ante-natal departments of hospitals, as Professor Browne of University College Hospital has shown,³ have not come up to expectations, as is evidenced by the fact that the proportion of their booked cases which develop unexpected difficulties in labour is still disappointingly high, and the incidence of eclampsia in the practice of these hospitals has shown little diminution since their ante-natal clinics were established. It would be expected, on the other hand, that both of these complications of labour would be considerably less frequent when patients were systematically cared for by skilled ante-natal workers. I am quite aware that patients are often negligent in attending and may be lost sight of for weeks together, but efficient ante-natal work implies that the patient must be rounded up at regular intervals if she does not keep her appointments.

It is necessary to take broad views of what is comprised in ante-natal supervision—much more than an estimation of the size and shape of the pelvis, and the testing, at intervals more or less regular, of the urine for albumin. Let it be admitted if you will that pregnancy is a normal event in a woman's life, it is all the same an event which under the conditions of life which prevail to-day calls for careful and skilled supervision if the risks of disaster are to be minimized. There is a good deal to be said for the view that the highly civilized woman of to-day compares unfavourably, in the performance of her chief physiological function, with the less favoured woman of earlier periods. She is sometimes an unwilling mother though married, and this attitude of itself handicaps her from the very beginning; further, she has a great dread of pain, and, I think, a diminished capacity to bear it. These are some of the reasons why the women of to-day need more watchful care in pregnancy than did their grandmothers.

A woman who is knocked out by her labour for a few days is a comparatively easy prey to infection: or perhaps it would be more correct to say that a degree of mild infection which a robust woman would easily throw off may assume serious proportions in one who has been exhausted by her labour. The general health of the pregnant woman, therefore, calls for special attention. Foci of chronic infection in the mouth or throat are clearly of particularly grave significance in the light of what we now know about the risks of droplet infection. Anaemia, dyspepsia, constipation, have a debilitating effect, and should not be regarded as unworthy of attention in ante-natal work. It is impossible to go over all the matters which are of importance, but may I call the attention of the practitioner-consultant to recent advances in our knowledge of the dieting of pregnant women, and especially to the evidence that a dietary rich in vitamin A may be expected to enable the patient to put up a more energetic resistance to infection should this occur.

The importance of making frequent measurements of the blood pressure is stressed by the Departmental Committee in its final report, and it advises that "midwives should be trained to make blood pressure determination" (p. 137). I should be interested to hear what members of the Cardiff Division think of this suggestion. They are, I am sure, aware of the importance of blood pressure observations when symptoms of toxæmia appear, for a rise in diastolic pressure sometimes gives the earliest warning of the imminence of eclampsia.

I think I have now said enough to show that ante-natal supervision offers a field of work which is well worthy of your attention. In the words of the Final Report of the Departmental Committee: "It is essential that ante-natal care should reach the highest possible standard of excellence, and that no slipshod work should be allowed to pass muster."

In another Departmental Report⁴ the statement is made that in some areas it is difficult to make arrangements for ante-natal supervision by general practitioners "because all doctors are not yet sufficiently interested in the work to wish to undertake the responsibilities which effective ante-natal care involves." I have no doubt it is true that not all doctors are sufficiently interested, but it certainly is not true that no doctors are sufficiently interested in the work to do it properly. There must be many men and women practising as family doctors who are interested and who would be willing to fit themselves to carry it out efficiently. The moment is ripe for them to come forward, and it is not too much to expect that their services would be welcomed by the local authorities in many instances, if not in all.

REMOTE RESULTS OF INJURY OR INFECTION

There is one other matter I should like to refer to. Our aim is not fulfilled if our patient merely escapes with her life; it is necessary that she should be able to resume a full and active life within a reasonable time after her confinement. This only too often we fail to achieve. The records of the gynaecological departments of the hospitals offer the clearest evidence of this: it is agreed that a considerable proportion of the patients treated are suffering from the remote results of injury or infection, or very often from both, following labour. The proportion has been variously estimated at 47.3 per cent. by one observer to 30 per cent. by another. These conditions are very frequently overlooked at the time because a thorough local examination is not made when the patient is ready to be up and about once more. Only when it is recognized that such an examination should be regarded as a routine measure for every case shall we have taken the first step towards the alleviation of the heavy toll of ill-health and disability which now results from childbirth.

It is very difficult to obtain definite evidence as to the frequency of non-fatal complications of the puerperium in domiciliary practice. The nearest we can get to such evidence is found in the records of outdoor hospital midwifery, and although all maternity hospitals publish their indoor morbidity rates not all of them record their outdoor rates. By puerperal morbidity is meant a degree of fever which constitutes notifiable pyrexia—namely, a temperature of 100° F. or over on two occasions from the second day of the puerperium onwards. I should like in this connexion to call your attention to certain recent observations which demonstrate how an improvement in these puerperal morbidity rates was brought about. These observations are from the outdoor maternity service of University College Hospital, London, as reported by Miss Gladys Carter.⁵ They cover a period of about two and a half years, in which 1,360 cases were attended; all but thirty-three cases were delivered in their own homes; of those sent to hospital one died, giving a total maternal mortality of 0.57 per cent., which does not differ greatly from that of the East End Hospital already referred to. During the first half of the period under review the students attended their cases without the assistance of a nurse; during the second half they had the assistance in every case of a nurse-midwife—that is, a State-registered nurse who had also taken obstetric training. Sterilized gloves were in routine use throughout the whole period, and masks were also used throughout

almost the whole period. The only difference, then, was that during the second period the students were accompanied by a nurse-midwife. Miss Carter selected the occurrence of notifiable puerperal pyrexia as the test of the effect of this change, and she found that during the first period 5.22 per cent. of the cases were notifiable as puerperal pyrexia; during the second period the proportion fell to 2.19 per cent. There were no fatalities during the second period.

In comparing these results with those of the East End Hospital it must be remembered that the number of cases dealt with in the University College Hospital series is comparatively small, which to that extent invalidates comparison. It was, however, reported⁶ that the puerperal pyrexia rate for the East End series was 1.1 per cent., while that for the University College Hospital series was 5.29 per cent. in the first half and 2.19 per cent. in the second half.

It would be wrong to look upon these minor complications of the puerperium as of no importance. It is probable that about 50 per cent. of them are due to minor degrees of uterine infection, either alone or in combination with injury, which may lead to long periods of suffering and invalidism. I would further call your attention to the fact that evidence is fast accumulating that chronic inflammatory changes in a cervix damaged in labour form a definite predisposing cause of cancer. Leucorrhoeal discharges in women who have been recently confined, therefore, call for careful local examination of the cervix, for the great majority of such discharges arise in fact from that part. The importance of prolapse and backward displacement of the uterus calls for no emphasis. Post-natal examination is essentially work for the man with practical experience: it does not demand a high degree of technical knowledge, and it could, with advantage, be entrusted to practitioners who will fit themselves to undertake it and to deal with it efficiently.

CONCLUSION

The outcome of all that I have been saying is this. I would suggest that the position of the general practitioner in relation to midwifery has already changed, and will probably change further, inasmuch as the bulk of the attendance upon confinements in the industrial classes is passing into the hands of midwives. With this change new opportunities are opening up for the doctor: in respect of the practice which is being taken out of his hands he may become, if he will, the consultant at first instance to the midwives. It is estimated that midwives already attend from 60 to 70 per cent. of the total births of the country, and in some areas the proportion is higher than that, and it appears to be rising year by year. The proportion of midwives' cases in which a doctor's services are called for is also steadily rising. Much of the ante-natal and post-natal work now being carried on could be efficiently done by general practitioners. If, however, he is to rise to this opportunity the practitioner must make himself efficient in practical knowledge, and he must try to keep himself abreast of progress in all departments of midwifery. He would then become a very important link in the chain of a national maternity service, and in my submission the work would be well worthy of the English doctor at his best.

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- ² *Loc. cit.*, p. 128.
- ³ Ante-natal Care and Maternal Mortality, *Lancet*, July 2nd, 1932.
- ⁴ High Maternal Mortality in Certain Areas, p. 7.
- ⁵ The Domiciliary Service of a Maternity Hospital, *Lancet*, January 2nd, 1932.
- ⁶ *Loc. cit.*, p. 135.

HEPATOMEGALY WITH PERSISTENT KETONURIA IN A CHILD

PROBABLY A CASE OF VON GIERKE'S "GLYCOGEN ACCUMULATION DISEASE" WITH FUNCTIONAL RECOVERY

BY

C. WORSTER-DROUGHT, M.D., M.R.C.P.
PHYSICIAN TO THE METROPOLITAN HOSPITAL, ETC.

With Remarks in Collaboration with
F. PARKES WEBER, M.D., F.R.C.P.

The following case was shown by me on March 23rd, 1923, at the Royal Society of Medicine (Section for the Study of Disease in Children, *Proceedings*, 1923, xvi, 56-60), under the heading "A case of enlarged liver with persistent acetonuria and diaceturia." The patient, a girl, was first seen at the age of 10, on June 10th, 1920.

HISTORY OF THE CASE

Father and mother were both alive; the former always had good health, but the mother was deaf (otosclerosis). The mother was the eldest of eight children; of the seven, three had died of phthisis, one had had a tuberculous wrist-joint, two had been epileptic, and one had been quite healthy. In the father's family there was nothing of note. Wassermann reaction (blood) in both the father and mother was negative. The patient had a sister, aged 7, who was said to have an "enlarged liver." On investigation the liver edge was found to be palpable two inches below the costal margin, but x-ray examination indicated ptosis of the organ rather than enlargement; the spleen was impalpable, and there were no other physical signs of importance. Wassermann reaction (blood) was negative.* The only other child had died twelve years before at the age of 3; he was said by a doctor to have had an "enlarged liver and spleen" and to have died of "kidney disease."

The mother stated that pregnancy and labour had been normal, and that at birth the child had weighed 11 lb. She had been breast-fed, and had been perfectly well until 1 year old. From the age of 1 to 4 she had suffered from "fits" (description suggested epilepsy, with average frequency of one fit in two months), and between the ages of 3 and 5 had suffered from recurrent attacks of vomiting, strongly suggestive of cyclical vomiting. She had not appeared to grow during that period, and a medical man had said that "the liver was enlarged." She had not walked until she was 4 years and 3 months. Since that time her general health had been fairly good, and from the age of 5 she had grown steadily.

Photograph of the patient at the age of 12.

PHYSICAL EXAMINATION AND SPECIAL INVESTIGATIONS

The patient was very bright and intelligent, her mental capacity being fully up to her age standard. Physically she was rather undersized, and the development of the body was somewhat out of proportion to that of the limbs: height, 47 inches; spine from occipital protuberance to tip of coccyx, 20 inches; subcostal girth, 28 inches. The skull was normal. The teeth showed indentation on enamel of incisors, the margins of which were slightly irregular; other teeth were normal. The breath had a strong acetone odour. The liver edge was felt three inches below the costal margin, the edge being firm but not irregular. The spleen was impalpable and not enlarged to percussion. The heart, lungs, and nervous system were normal; brachial systolic blood pressure,

* This sister has since developed definite otosclerosis, but is otherwise well (January, 1933).