ception is more helpful in understanding and controlling the phenomena in question.

The most useful distinction between the connotation of "functional" and "organic," as applied to disordered processes, would seem to be that in the former the causal factors act through the ordinary channels by which those processes are normally activated, whereas in the latter the causal factors do not act through those channels. For example, a hysterical hemiplegia is termed functional because the absence of movement in the paralysed side is produced by the ordinary machinery whereby one side of the body is normally kept still, whereas in an organic hemiplegia the absence of movement is due to an external factor which does not act through the ordinary channels, but is as it were impinged upon the machinery from the outside. The hysterical hemiplegia is further called "psychogenic," because we can conceive the causal processes, which ultimately utilize the ordinary machinery to express themselves, in psychological terms more profitably than in neurological terms. In the future these processes may prove capable of being represented in terms of the activity of the central nervous system, and with this advance in knowledge it may be found that the psychogenic mode of explanation may profitably be discontinued.

If we apply this terminology and these principles to the problem of delirium, it is clear that in the great majority of cases the *primary* causal factors are "organic," and consist in a modification of brain substance produced either by a toxin or a degenerative process, and not by stimuli acting along the channels whereby that area of brain substance is normally activated or inhibited. It is conceivable, of course, that the neurological substrata underlying processes at present best represented in psychological terms may be capable under certain circumstances of producing a similar modification of brain substance, and such a process may explain some instances of hysterical delirium. Only in this sense, however, can we speak of a delirium being *primarily* psychogenic.

If this primary organic process has occurred, the particular features which the delirium displays may be conditioned by factors in which the primary process is not concerned. If we accept Hughlings Jackson's view that these features are due to the uncontrolled activity of healthy lower centres, then this activity will presumably be explicable in the future in terms of neural mechanisms not affected by the primary process. It would therefore not be "organic" in the sense defined above, except in so far as there may be modifications of brain substance due to "constitutional" or "congenital" conditions affecting the functioning of the mechanisms in question. At present it is probable that this "lower centre" activity of Jackson may be best understood in terms of psychological processes and concepts, and hence be properly treated as "psychogenic." In this way we can understand the frequent statement that while the form of a delirium is organically determined its content is largely influenced by psychogenic factors, and the conclusion reached by Wolff and Curran, and other investigators, that the content of a delirium is dependent in large part on the individual equipment and experience of the subject. If, on the other hand, it is considered probable that the lower centres are directly influenced by circulating toxins and therefore not "healthy," then their activity would be partly ascribable to an "organic" process, and not entirely to "functional" processes.

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PULMONARY TUBERCULOSIS AND PREGNANCY*

BY

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Of all the facts in regard to the influence of pregnancy on pulmonary tuberculosis with which the obstetrician is brought face to face, the most significant is the devastating influence of labour and the puerperium on the course of the disease. This is well brought out in a survey of the history of forty-six cases which I have carried out for the purpose of this communication. In this group there was a total of fourteen deaths, or 30.4 per cent. If we restrict the study to those cases whose follow-up has extended to one year or more and to those who have died within this period we are left with thirty-six patients, of whom fourteen died, giving a death rate of 38.8 per cent. Of this total eight, or 57.1 per cent., died during the interval from a few days up to three and a half months immediately after the confinement; twelve, or 85.7 per cent., died within two years of the confinement.

The damaging influence of pregnancy and labour is revealed in another way. Out of the eight cases in which death occurred within three and a half months after labour it was found that the pulmonary disease had, in seven cases, existed for periods varying from one to ten years. This demonstrates very clearly the manner in which pregnancy and labour bring to bear upon a chronic disease an acute, critical, and often lethal influence. The same lesson is brought out by the evidence which has been furnished by many observers to the effect that a latent lesion may first reveal itself subsequent to the birth of a child. There are two such cases in my series, in which the onset of the disease became first apparent soon after a birth previous to that for which she was subsequently under treatment. It is obvious that this aspect of the subject is more likely to come within the ken of the physician and the tuberculosis officer than the obstetrician.

Effects on Temperature

The way in which labour and the puerperium so often cause a flare-up in the disease is demonstrated dramatically by a study of the temperature charts of a series of cases. We can in this way recognize how frequently, even in those cases where activity is not in doubt, there occurs a rapid deterioration in the local and general condition. In twenty-seven cases, or 58.6 per cent. of the forty-six cases which have been the subject of this investigation, there was an appreciable depreciation in the clinical condition in the puerperium. In eight, or 17.4 per cent., death occurred within three and a half months.

In view of this evidence, which we may regard as a commonplace in the experience of those obstetricians who have observed a considerable number of such cases, it may seem somewhat surprising that there are still some few

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obstetricians and physicians who deny its relevance, and who maintain that the fate of the phthisical woman is not materially prejudiced by the fact of child-bearing. It is true that pregnancy itself in many instances seems to exert a favourable influence on active disease, and from this no doubt has arisen the opinion widely entertained by the laity that women suffering from pulmonary tuberculosis stand to profit by child-bearing. It also, to some extent, explains the attitude of those medical men who maintain that, despite the well-recognized risk associated with labour and the puerperium, the general effect is beneficial or, at the worst, merely negative, and who do not regard active pulmonary disease as necessarily a deterrent to marriage and child-bearing.

Experience of Other Workers

I believe these views to be unsound and dangerous, and to have been responsible for much of the tragic circumstance that surrounds this subject. The attention which has been devoted to the question during recent years has provided increasing evidence of their fallacy. Robinson addressed a questionnaire to 200 specialists throughout the world and, from their replies, concluded that "the chances appear to be nearly five to one against the effects of pregnancy being harmless to a tuberculous woman." Rist, in a paper opening a discussion on this subject at the Edinburgh Meeting of the British Medical Association in 1927, adduced striking evidence along the same lines. Of fifty-two women suffering from tuberculosis who became pregnant, the disease was aggravated in forty-four, or 84.6 per cent.; and nineteen, or 36.5 per cent., died within one year; of these nine died during pregnancy or within three months of labour. Further, of fifty-five women who first developed the symptoms during the course of the pregnancy, twenty-two, or 40 per cent., were dead within one year.

It is not clearly understood why during pregnancy the clinical features of pulmonary tuberculosis are so apt to abate, nor why, after labour, they are so apt to increase in their intensity. It has been claimed that the suspension of the blood loss of menstruation and the safeguarding of the calcium reserves which this implies may be a factor of some importance in explaining the relief during pregnancy. It has also been suggested that the increased rest and attention to general hygiene enjoined by pregnancy may play a part. Many specialists, however, believe that the most important influence is the upward rising of the uterus and the splinting of the diaphragm with a consequent restriction of the lung movement, especially during the later months. Conversely, it is maintained that the sudden release of this upward thrust after labour, and the recovery of the freedom of lung movement with, in addition, the straining incidental to delivery, leads to a dissemination of the disease, and to the aggravation which reveals itself during the puerperium.

Puerperal Crisis

However we may explain it we have to recognize, as I have stated at the beginning of this paper, that the puerperal crisis is the most sinister feature of the problem. The influence it exerts in initiating the local deterioration that the majority of our cases suffer at this time and which in a high proportion progresses to a rapid issue must be regarded as pointing to the main responsibility inherent in the management of pulmonary tuberculosis complicating pregnancy. All other considerations are of secondary importance when compared with the necessity of safeguarding the patient as far as is possible against this, the major, risk. We do not minimize the urgency of this consideration by the statement that it is not all cases, even among those with active disease, who exhibit this

puerperal exacerbation; it is true that a certain proportion pass through labour and the puerperium with their disease little influenced. Nevertheless, the fact that must dominate any attempt to estimate the risk is that the majority of active cases are adversely affected, and that quiescent and even latent lesions may be stirred into activity.

Sanatoria and Maternity Hospitals

When we pass to the consideration of the best ways of protecting the tuberculous woman against the damaging influence of child-bearing we are faced with difficulties that are both grave and varied. Many of these difficulties are of such a kind as can more adequately be dealt with by the tuberculosis specialist. They relate to matters that more especially concern the medical expert and on which the obstetrician cannot presume to speak with authority in so far as it rarely falls to his lot to see such patients except as infrequent incidents in his routine practice. In this connexion it cannot be denied that in many respects the management of the phthisical woman who has the misfortune to become pregnant is often apt to suffer from the dual medical control that obtains under existing conditions. Thus, the practice of transferring a woman with active tuberculosis from a sanatorium where she has been treated during her pregnancy to a maternity hospital for the purpose of her confinement is apt to lead to a breach in that unity of supervision which is so important in all obstetric cases, and which is especially necessary in tuberculous women. In the first place, in few maternity hospitals can the women find the suitability of environment which is possessed by the sanatorium and which is doubly necessary during a period of such extra danger. For the isolation which is demanded by such cases the segregation department of an ordinary maternity hospital is not only unsuitable, but may be dangerous. Further, the specialist nursing and the constant specialist medical care and treatment can rarely be reproduced within the walls of a maternity institution.

It is difficult to evade the conclusion that some of the tragedy that surrounds child-bearing in the tuberculous woman is to be traced to the inadequacy of the control to which we have referred. Further, it may be urged that much of the divergence of view and of the uncertainty that relates to the best means of managing such cases arises from the fact that this lack of unified control has undermined efforts directed to a proper study of the problem in its many and varied aspects. It may be urged with reason that the difficulties to which I have alluded could best be eliminated by recognizing that the delivery of such women should become a function of the sanatorium in which they are being treated for their medical condition. The powers possessed by the local authority in regard to both tuberculosis and maternity would seem to provide the means by which this desirable arrangement can be achieved. The preventive aspects of our subject can be considered under several headings.

Advice as to Marriage and Child-bearing

The woman with active disease should be dissuaded from marrying and, if married, from bearing children. The period which must elapse after the arrest of active disease before marriage or child-bearing is allowed is a matter for consideration in each special case. The physician will in general demand three years' freedom from all symptoms and satisfactory x-ray and other physical evidence of healing. In some instances where the prevention of child-bearing is of urgent importance operative sterilization or sterilization by radiation methods may be employed. In other cases the patient and the husband should be instructed in birth control methods.

Abortion

The place of therapeutic abortion in the treatment of the tuberculous woman is difficult to define. It is the method of choice where the clinical condition is at the moment satisfactory but the state of the lungs is such as to justify a reasonable anticipation of danger after a full-time delivery. The procedure is thus fully justified in the case of an undesirable pregnancy in a woman who has recently passed through a gestation ending in a turbulent puerperium. There can be little doubt that in the less severe grades of the disease termination of pregnancy in the early months is an obstetrical procedure associated with less risk than delivery at the later months. It is now generally agreed that to give the maximum of protection the abortion should be performed within the first three months, and that the earlier in pregnancy the interference is carried out the better. Some observers maintain that after the third month the operation is futile, and that in all cases seen after that date it is safer to allow the pregnancy to continue. It is difficult on obstetrical grounds to justify this extreme view and more supporting data than are at present available are required before it can meet with complete acceptance. In the present state of our knowledge there is no adequate reason for doubting that abortion at, say, the fourth or even the fifth month may in suitably selected cases give an increased protection.

The technique adopted is within certain recognized limits of as great importance as the selection of the time for its performance. It has to be noted that the emptying of the uterus during the early months, unless carried out with care and skill, may seriously imperil the patient's chances. The choice of the anaesthetic is important and, in this connexion, it is imperative to avoid inhalant drugs that tend to pulmonary irritation, such as ether. In the selection of the anaesthetic regard must also be had to the risks of post-operative nausea and sickness. In the next place, the operation should be carried out with as little risk of shock and blood-loss as possible. Further, it is important to safeguard the patient as far as is attainable against pelvic sepsis, which is especially prone to prejudice the outlook of the tuberculous subject. Evacuation of the uterus by abdominal hysterotomy is a quick and safe procedure and, when carried out under spinal anaesthesia, it is relatively bloodless. It is, also, associated with less risk of sepsis than evacuation through the vaginal route. It has the further advantage that sterilization can be effected at the same time. Where evacuation by the lower route is decided upon the two-session method should be adopted. At the first session it is my practice to introduce two or three laminaria tents after cervical dilatation and, twenty-four hours later, to carry out the evacuation. Avertin given rectally as a basal anaesthetic in a dosage of 0.1 gram per kilo of body weight, reinforced, if necessary, by a carefully administered gas-oxygen mixture, is safe and suitable.

Management of Later Months

For those cases unsuited because of the severity of the pulmonary lesions for therapeutic abortion in the early months, and for all cases first seen in the latter months of pregnancy, the gestation should be allowed to continue. The treatment is directed to the building up of the patient's health and to the employment of those local measures, such as artificial pneumothorax in unilateral lesions, which are calculated to help the pulmonary condition. It is further of the utmost importance that for the delivery and the puerperium the environment should be selected with a view to its suitability for the management of such cases. During the delivery the patient should be protected against the risks of haemorrhage, shock, and sepsis. Here, again, the

anaesthetic should be carefully selected. We have previously referred to the dangers inherent in a system which tends to divorce the care of the patient during the obstetrical period from that during the ante-natal phase.

The phthisical woman is unfitted for nursing. The damaging effects of lactation on the pulmonary lesions are notorious. Further, the risk of the transmission of the disease to the infant is considerable. The interests of the child are best served if it can be completely removed from the home until the active phase in the mother has been arrested.

I wish to acknowledge my great indebtedness to Dr. H. Nockolds, Medical Superintendent of Lewisham Hospital, for placing at my disposal the records of 44 cases, and to Dr. A. Middleton Hewat, Senior Medical Officer to the London County Council, for providing me with the notes on the subsequent progress of the cases studied.

PULMONARY TUBERCULOSIS AND PREGNANCY*

BY

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I approach the problem of tuberculosis and pregnancy as a general physician, expert in neither of the special subjects professed by the Sections which have combined in this meeting. I decline on this account, however, to offer an apology to those who would question your choice in asking me to open this discussion and condemn my judgement in accepting your invitation. The conductor of an orchestra aims at interpreting a musical composition according to his conception of it as a whole; his job is to integrate into a harmonic unity the work of the individual instrumentalists under his baton. He cannot play the violin as well as his leading violinist; indeed his performance on any instrument may be worse than that of the meanest member of his orchestra. But the finished performance is *his* conception, and he alone must decide what contribution to this end shall be made by the separate members of his orchestra.

Now the general physician is like unto the conductor of an orchestra. He views the problem which a patient presents as a whole; he recognizes, and should hasten to take advantage of, the more detailed knowledge and particularly the greater technical skill of his specialist colleagues, be they surgeons, obstetricians, aurists, orthopaedists, and the like. But he must remain the overseer, the integrator of the many phases of the problem presented by his patient, and he will, also, remain the judge in his wider and deeper wisdom of how far general conclusions to which his specialist colleagues have come are applicable to the individual patient under his care.

This discussion limits itself to pulmonary tuberculosis, but considers its effects on all phases of child-bearing. I shall omit the consideration of historical *obiter dicta* on this subject which have been forthcoming since the time of Hippocrates, for though they are of consuming interest and fascination to the historian of medicine, their slender foundation and their mutual contradiction deny them a place in a scientific discussion.

What are the questions to which it is desirable that accurate answers based on unimpeachable statistics should be forthcoming? Clearly the most significant is, "Does child-bearing lessen the mother's resistance to the tuberculous infection?" This might be considered under three subheadings: (1) Does child-bearing activate (a) a latent,

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