stomach is empty, and must also be combined with some drug which has more powerful affinities for alkalis (such as ferric perchloride) in order to prevent its neutralization by the alkalis of the duodenum. Where there is retention of the gastric contents owing to atonic dyspepsia or pyloric spasm its use is contraindicated owing to the certainty of the mercurial salt being converted into an albuminate.

2. It must be remembered that the two perchlorides in some cases tend to irritate the gastric mucous membrane, and therefore the remedy is best given in circumstances which ensure as rapid a passage into the duodenum as possible. This object is best attained by giving the drugs fifteen or twenty minutes before meal-times when the stomach is already becoming active in preparation for the reception of a meal.

In acute cases, when definite meals are not given, the remedy can be given every four hours, and is usually quite well tolerated. This combination of perchlorides is as a rule wonderfully well borne, even by patients who are quite unable to take iron as usually administered after meals. I have not infrequently known patients take this mercury and iron mixture continuously for six months or more, except that sometimes, but not always, it is in women found advisable to omit it for a day or two at the commencement of the menstrual period.

Another fact to be borne in mind is that sometimes the continued use of this drug causes a loss of weight, suggesting the possibility that the antiseptic interferes with some of the bacteriological processes upon which digestion depends; it is therefore well to watch the weight in patients who are taking it regularly.

PERNICIOUS ANAEMIA:

SOME MORPHOLOGICAL AND ETIOLOGICAL CONSIDERATIONS.

BY

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THE paper by Dr. A. F. Hurst in this JOURNAL (January 19th, p. 93) has once more called attention to the haemolytic conception of pernicious anaemia. He states that—

"The most characteristic features of the blood in Addison's anaemia are now recognized as being the great inequality in the size of the red corpuscles—the anisocytosis—due to the presence of microcytes and megalocytes, and the increase in their average size in spite of the presence of some cells far smaller than the smallest cells found in normal blood."

These features are not specific unless they are associated with a large amount of haemoglobin. Anisocytosis without such excess of haemoglobin can be observed in all the secondary anaemias. Dr. Hurst has made use of the graphic method of determination of the size of the red corpuscles, and, valuable as this is, it is less accurate than the viscosimetric method of estimation of the average volume of the red corpuscles. This defect of the graphic method is well seen in acholuric family jaundice, where the average size of red corpuscles is high although the cells look small; this is due to their globular form. The viscosimetric method demonstrates that the high average volume persists throughout the remissions of pernicious anaemia.

Dr. Hurst states that megaloblasts may be found in the blood in conditions other than pernicious anaemia—for example, lead poisoning. The difficulty which arises here depends upon faulty nomenclature. The various types of nucleated red cell seen on occasions in the course of examining stained films are, first, normoblasts, which are fully haemoglobinized red cells of normal size (incompletely haemoglobiniferous cells are also seen); secondly, macroblasts, which are large pale specimens of the former; and, thirdly, megaloblasts, which are supplied with a full complement of haemoglobin, and, when young, have a finely reticular nucleus. The megaloblast does not in any way resemble a very immature form of nucleated red cell, as does the pale macroblast. In the course of its development the

megaloblast loses its nucleus, and the resulting cell is a megalocyte, which is supplied with a full complement of haemoglobin. Normally a macroblast is converted into a normoblast, which loses its nucleus and gives rise to the ordinary red corpuscle, but under some circumstances the macroblast loses its nucleus and gives rise to a pale (polychromatophilic) red cell of large size (macrocyte).

The megalocyte is thus seen to be a mature corpuscle, while the macrocyte is incompletely developed. The difference between these cells lies in the fact that, while both are giants, the macrocyte is only morphologically gigantic, whereas the megalocyte is also a functional giant. Osler called attention to a peculiar feature of pernicious anaemia:

"A surprising fact is that there are many patients with extreme anaemia who are remarkably vigorous. One may see patients with a count of about two million red cells who insist that they are able to do everything as usual, except for a little shortness of breath."

No other anaemia presents this astounding feature, and in no other anaemia of adult life are megaloblasts and megalocytes, which are the functional giants accounting for this peculiarity, formed. Hurst agrees with those writers who regard the presence of megaloblasts and megalocytes as being due to "an unusual degree of regenerative activity," although a little later he attributes the leucopenia of the disease to defective function of a poisoned bone marrow. The reconciliation of the two statements appears to be impossible.

Hunter's conception of pernicious anaemia as a haemolytic anaemia receives Hurst's support, but there is no resemblance between it and the known haemolytic anaemias—namely, acholuric icterus. There is definite morphological evidence of defective function of the marrow in that the hyaline leucocytes are always reduced in number and that there are always a varying number of polymorphonuclear leucocytes of large size with hypersegmented nuclei. All the known toxic conditions cause fine changes in the polymorphonuclear leucocytes—for example, diminution in number of the granules and irregular size and distribution; these changes are absent in pernicious anaemia, and confirm the opinion that the toxin of the disease acts on the bone marrow, not on the circulating corpuscles.

Achlorhydria is regarded by Hurst as an invariable concomitant and precursor of the disease, but one of the cases recorded by Levine and Ladd¹ showed some free acid in the gastric juice when first observed, and the diagnosis was confirmed at autopsy. I have observed a case of sub-acute combined degeneration of the cord, in which free acid was present; there was no anaemia, but viscosimetry showed that the average volume of the red corpuscles was already high. The diagnosis was confirmed by the later history of the case and by autopsy. Achlorhydria, when once developed, is persistent, but not more so than the increased average volume of the red cells, the reduction of hyaline cells, and the hypersegmentation of polymorph nuclei.

Cases of pernicious anaemia occurring after gastrectomy for carcinoma are attributed by Hurst to the resultant achlorhydria. These cases may be of great value, but no detailed blood counts are published, and there must therefore be some doubt whether these cases were pernicious anaemia or the "pseudo-pernicious" anaemia associated with secondary deposits in bones, which may closely simulate the disease.

There is obviously excessive haemolysis in the course of the disease, but this, apparently, depends upon the peculiar type of cell which is presented to the haemolytic organs; the haemolysis is the cause of the anaemia but not necessarily of the disease.

Zadek,² who trephined the tibia during a remission of the disease, found that there had been reversion to fatty marrow and very few cells were present. Myeloblasts are an invariable constituent of the bone marrow in pernicious anaemia, but are not present in the marrow of the normal adult or in other anaemias—that is to say, they are embryonic cells. The megaloblast as defined above is also an embryonic cell, and thus the two types of cell together conform to the old statement of Ehrlich that there is a reversion to an embryonic type of blood formation. Zadek has only

shown that the amount of megaloblastic marrow varies from time to time during the disease, but has certainly not shown that there is no such specific change.

There is one other point of difference between pernicious anaemia and all other anaemias which should be mentioned. The occurrence of another severe disease during the course of pernicious anaemia partly or completely obliterates the typical blood picture; this is well illustrated by Weinberg's³ case. The secondary anaemias are intensified by the advent of intercurrent disease.

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- ¹ Levine, S. A., and Ladd, W. S.: *Johns Hopkins Hosp. Bull.*, 22, 1921.
² Zadek, I.: *Schr. med. Woch.*, vol. 2, 1921. ³ Weinberg: *Deut. Arch. f. klin. Med.*, vol. 126, 1918.

Three Lectures

ON

CONTRACTED PELVIS.

DELIVERED IN THE UNIVERSITY OF LONDON,
FOR ADVANCED STUDENTS,

BY

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III.

THE MANAGEMENT AND TREATMENT OF CONTRACTED PELVIS.

THE one and only object in the consideration of contracted pelvis is to obtain that any woman with this complication in pregnancy will be delivered in the safest manner for herself and her infant.

The first fact that must be learned about contracted pelvis is that it does not of itself require treatment. Treatment is only indicated if the contraction is such as to cause arrest in delivery. Unquestionably the safest mode of delivery is by the natural passages as the result of spontaneous labour. If the dimensions of the pelvis preclude the passage of a reasonably moulded head, it becomes necessary to adopt some form of treatment designed to avoid the difficulties bound to arise at the time of delivery, but there is no form of treatment that compares favourably at the time or in after-results with normal spontaneous labour.

In my opinion there are only three methods of delivery in contracted pelvis justified by their results:

1. Spontaneous delivery, which includes forceps after the obstruction is passed, provided excessive moulding is not demanded.
2. Induction of labour, provided the infant is sufficiently developed.
3. Caesarean section.

All other forms of treatment are merely methods of overcoming abnormal difficulty which should not be encountered. Section is not called for before term, and is, therefore, the alternative to spontaneous labour and delivery. Induction is required before term and is the only treatment to be considered during pregnancy. Neither is entitled to enter into competition with spontaneous delivery at term.

Induction of Premature Labour.

Induction of labour should be considered if difficulty in labour is anticipated from contraction of the pelvis or excessive size of the foetus; in both the result is the same.

Induction may be adopted with benefit at any time from the expected date of confinement to four weeks before term. In contracted pelvis the foetus is seldom much above the average size, and induction more than four weeks before term is likely to be inimical to the infant's survival. The average infant is 7 lb. at term, but many are only 6 lb., and the average at the thirty-sixth week is only about 5 lb. The head of such an infant has a biparietal diameter of 3 to 3½ in., and it will take a very marked degree of contraction to interfere with the passage of this.

Except in some rare contractions the transverse diameter of the pelvis will never be reduced sufficiently to prevent lateral movement of so small a head and replacement of the biparietal diameter by a smaller one approaching the bitemporal. The cases that call for induction as early as the end of the thirty-sixth week are extremely rare and chiefly arise from the combination of contraction with large size of the foetus. As pregnancy advances in the last four weeks the foetal head is progressively increasing in size and more particularly in rigidity. At the end of the thirty-eighth week the average weight is about 6 lb. and the biparietal diameter 3½ to 3¾ in.; the infant when born is just as good a life as at term.

If all cases could be seen in time during pregnancy, induction could take the place of section in all except extreme degrees of contraction, but it can never be considered justified in a case capable of delivery spontaneously at term, and, therefore, cannot be adopted as the treatment for contracted pelvis *per se*; it will only be called for in less than 25 per cent. of all cases, and 75 per cent. will end spontaneously at term.

The method of induction which I adopt is the introduction of a soft rubber tube; there is never any difficulty, it is merely a modification of the method with bougies, and I think has the advantage of more certain asepsis. Whatever method is adopted, asepsis is the one essential. The operation can be carried out in private homes, but it is preferable to obtain surroundings more conducive to aseptic technique. The operation should be done with all the care of a vaginal operation, and with this there should be no appreciable difference in morbidity from uncomplicated labour.

If cases are properly selected for induction, delivery will be easy and spontaneous; delay may occur on the perineum and need forceps to complete, but this is nothing more than occurs in other normal cases. The infant is well developed, and requires no more care than one born at term; it is able to suckle perfectly, and has as good a prospect of survival as any. There will be a few cases of extreme contraction where induction will be required at or before the thirty-sixth week, and the infant will be so small as to reduce its survival prospect; such cases should be let go to term for section.

The time for induction cannot be fixed from the pelvic dimensions; it must be settled by a careful examination under anaesthesia to estimate when the head has or will reach the limit of size that will pass the brim of the pelvis easily. This can be done practically always with one examination, but if at the time selected the head is found smaller than necessary the operation should be deferred.

I have now to consider the management of cases that have reached term or, as in the majority of cases met with in the present day, are actually in labour. The choice lies between pelvic delivery and section. The condition of contracted pelvis will be suggested in a primipara by the one constant sign—a head free above the brim of the pelvis. In a multipara the history of previous labours will suggest the condition. In either case a careful abdominal examination is required, and all the other external estimates of the size of the pelvis. The majority of cases will show definite evidence that the head will go through, and then only require to be watched. The indications that the proportions are good are exactly the same as I have described in the examination of a case during pregnancy. A small number of cases will show evidence of marked disproportion, such as obliquity of the foetus or uterus in a primipara; this is of less importance in a multipara. Even in a primipara with a marked degree of simple flat pelvis obliquity of the foetus may not be against pelvic delivery. Other causes of signs suggesting marked disproportion must be excluded, such as excess of liquor amnii causing a free head, twins producing marked prominence of the abdomen, and relaxation of the abdominal walls from previous overdistension causing obliquity in a multipara.

In a multipara the mere history of a difficult labour is not sufficient to justify a section. The nature of the difficulty and the result of the labour and the skill or knowledge possessed by the attendant require to be carefully inquired into. A previous section will usually be an