

JULY, 1932.

The Antiseptic

A Monthly Medical Journal

EDITED BY

Dr. U. RAMA RAU & U. KRISHNA RAU, M.B., B.S.

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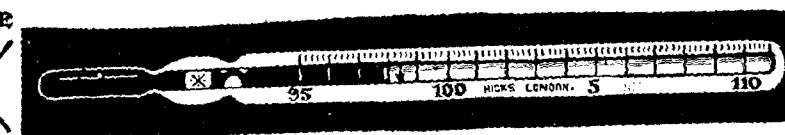
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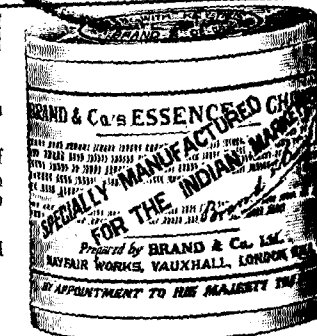
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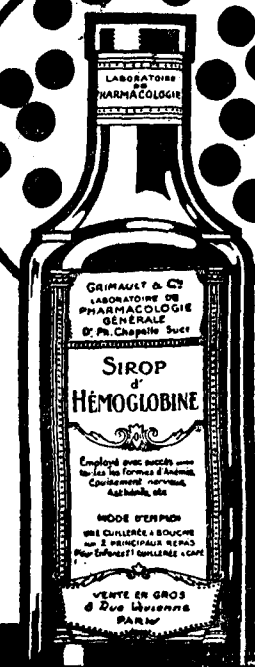
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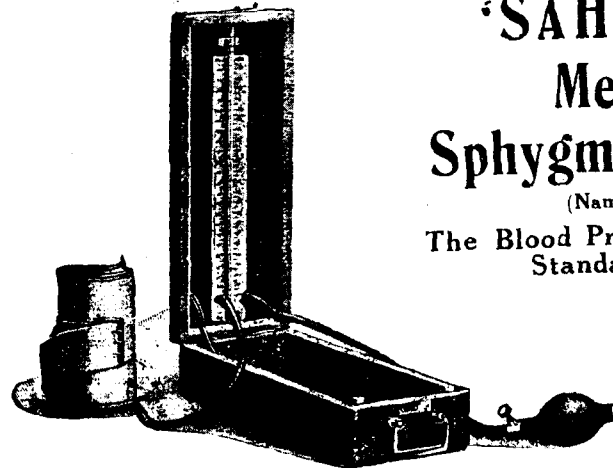
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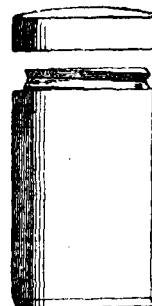
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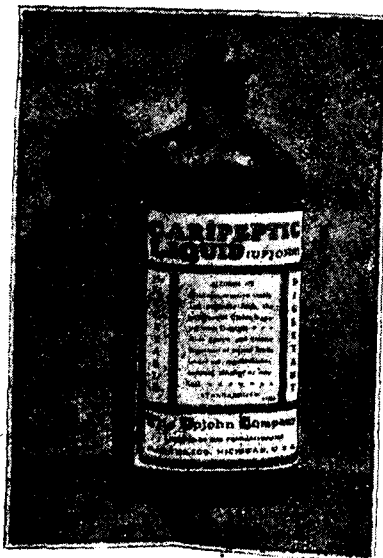
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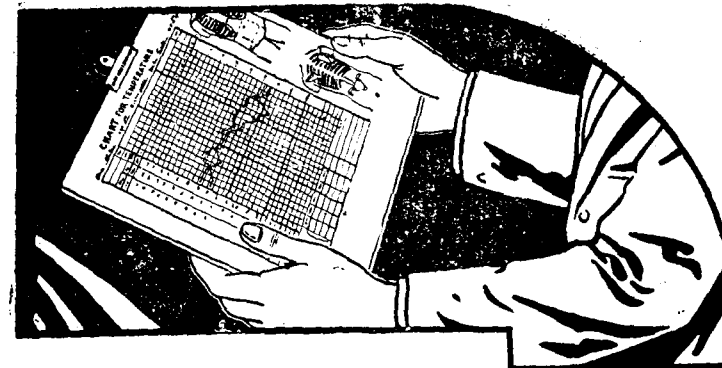
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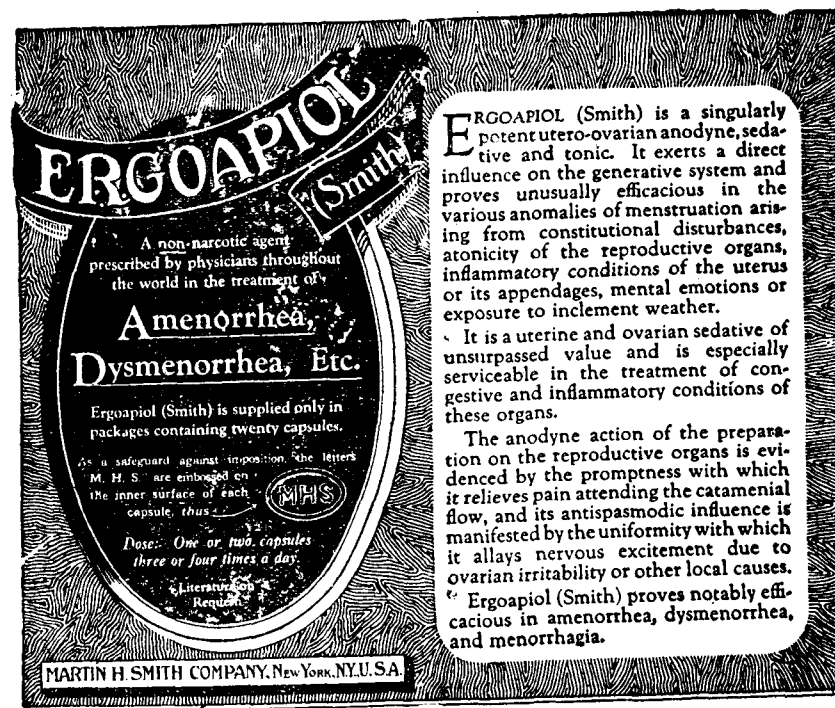
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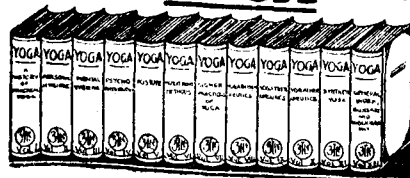
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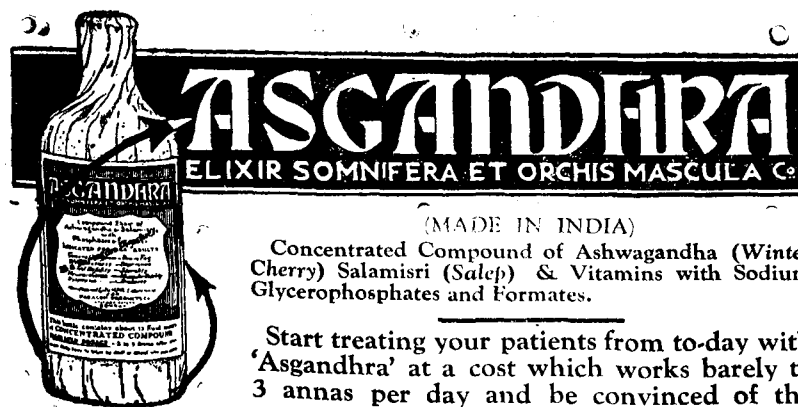
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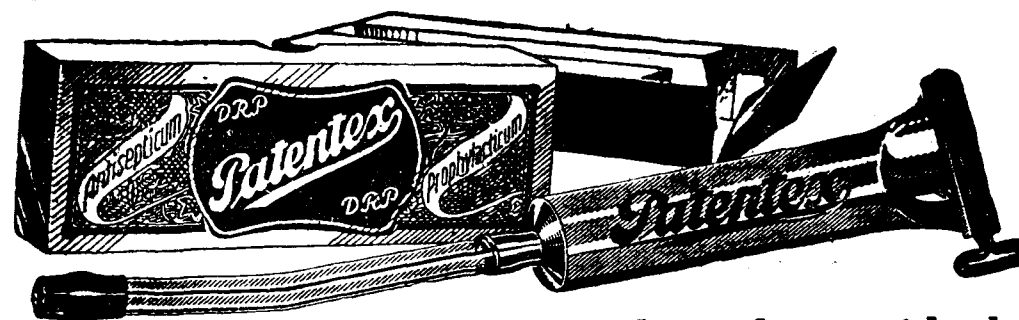
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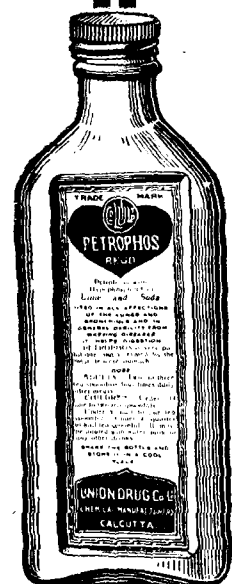
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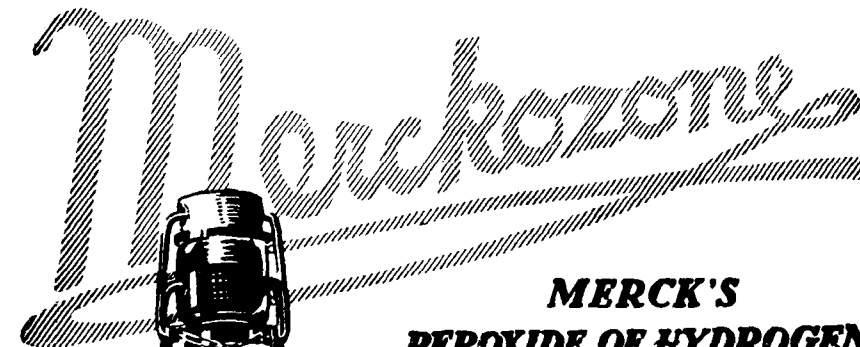
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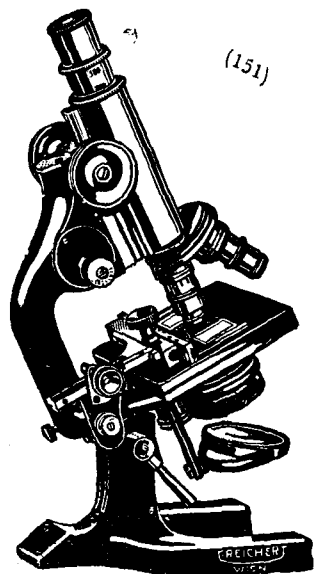


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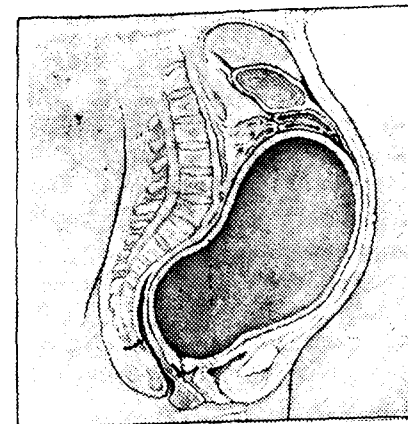
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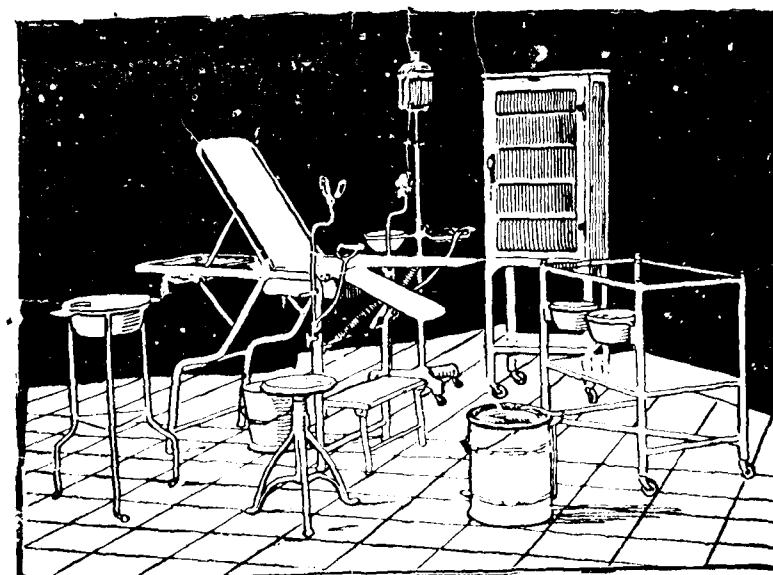
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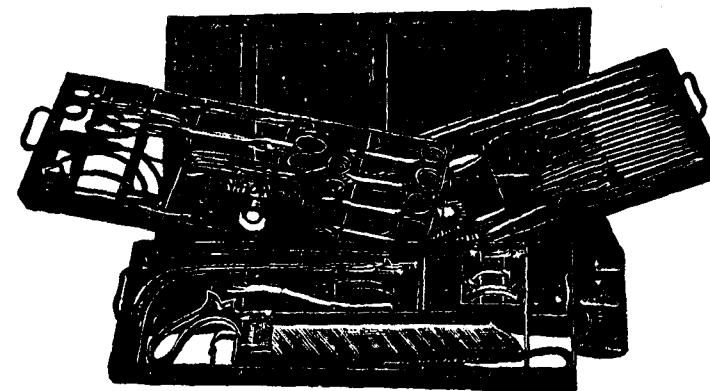
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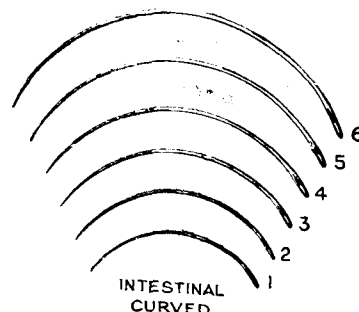
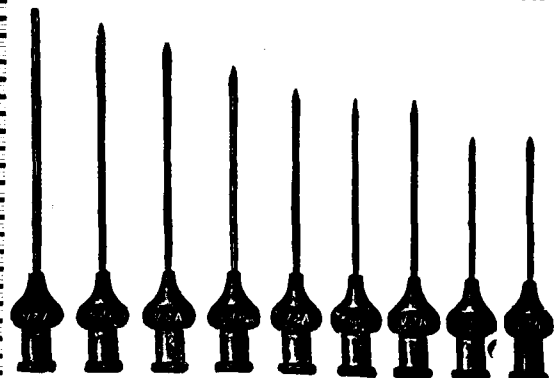
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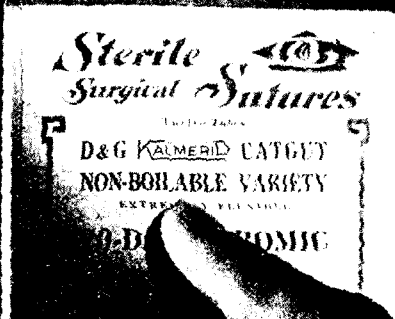
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SOME MODERN PROBLEMS IN OBSTETRICS.

BY

A. L. MUDALIAR, M.D., F.C.O.G.,

Giffard School of Obstetrics, Madras.

THE increasing interest that is now taken in the welfare of the mother and child by the general public has brought the subject of Obstetrics into greater prominence in all civilised countries in the world. It is now recognised that there is a heavy toll in maternity and that much of the mortality and morbidity of child-birth is preventable. The distressing fact cannot be ignored that in spite of the many recent advances in Medicine, the maternal mortality rates in Great Britain or the United States have not shown any decrease and the same may be said of many other civilised countries in the world. This has led naturally to the authorities taking steps to hold a national enquiry into the causes underlying such a state of affairs and the Ministry of Health in Great Britain appointed recently a Committee to enquire into the causes of the high incidence of maternal mortality in that country.

For a similar purpose, President Hoover, of the United States, called together "a White House Conference" in November 1930 wherein prenatal and maternal care was particularly discussed, as also the important problems of the undergraduate and graduate teaching of Obstetrics. This was the third White House Conference held, the first having been called by President Roosevelt in 1909 and the second by President Wilson in 1919. The White House Conference brought out again the fact that in the United States of America, approximately 15,000 maternal deaths occur every year, 80,000 infants die under one month, and 85,000 still-births occur. The importance of these figures lies in the fact that they show that no improvement has taken place and that most of the deaths occurred from controllable causes.

Puerperal Sepsis: The recent study of the Children's Bureau of the United States showed that 40 per cent. of the maternal deaths result from Sepsis, 26 per cent. from Toxaemias and 11 per cent. from Haemorrhages. The statistics of Great Britain reveal the same fact that mortality from sepsis continues to be high and has shown no tendency to decrease. Well might B. P. Watson ask the question—"Why is it that with all our present day knowledge, the incidence of Puerperal Sepsis and mortality from Puerperal Sepsis remains pretty much as it was before the days of Pasteur and Lister?" Why is it that while in the domain of Surgery, the brilliant discoveries of these two great Scientists have resulted in the practical eradication of sepsis and the feasibility of performing some of the most intricate operations on delicate structures, in Obstetrics alone the septic factor is yet uncontrollable and is still high? Why is it again so very difficult to prognosticate with certainty whether a difficult case of labour may or may not develop sepsis, despite all precautions that one may take? Surprising results are sometimes seen wherein a case badly handled outside and delivered after a great deal of difficulty passes through an apyrexial puerperium, while another delivered with all aseptic and antiseptic precautions in an institution, develops a severe and occasionally fatal form of sepsis.

Much interest has in recent years centred round the microbic factor in Puerperal Sepsis and investigations have been carried as to the presence of pathogenic organisms in the vagina of the pregnant and the parturient woman with a view to ascertain how far the presence of such organisms would account for the development of sepsis in otherwise unaccountable cases. Taylor and Wright (1) investigated the vaginal flora in 1,123 women immediately prior to delivery and the bacterial contents in the birth canal after delivery. The investigation is interesting more because of the negative rather than the positive findings and some apparently paradoxical results that were obtained. Thus, while in 32 cases

Haemolytic streptococci were present in the vagina before delivery, in none of these cases was there undoubted evidence of the production of sepsis by the Haemolytic streptococci present before delivery, and 29 of the group had an absolutely apyrexial puerperium. *Per contra*, Haemolytic streptococci and anaerobic cocci have been isolated from the lochia and from the uterine contents of apyrexial cases. The authors conclude with the observation: "What happens depends as in all infections, on the nature and virulence of the organism, the local conditions it finds for its multiplication and the resistance of the patient. Hence, the variation in clinical severity of cases caused by similar organisms; hence too, the almost inevitable failure of a prognosis based on bacteriological findings alone".

It is the last factor, "the resistance of the patient", that requires more detailed study. The problem for consideration is: Is there any difference between the resistance of a parturient and the resistance of a non-gravid female that might account for the greater susceptibility of the former, and if so, what is the factor responsible for such a condition? Another problem suggests itself from the clinical observations frequently recorded. It is a fact not uncommonly observed that in cases of prolapsed gravid uterus, where the cervix has been almost exposed to outside infection, sepsis is more frequent after delivery than before. These observations naturally compel one to study the soil more intensively and to search for causes which bring about the development of a favourable soil. Too often have Obstetricians concentrated on the sower and the seed, that they have not as carefully studied the soil and the possibilities of improving the resistance of the soil.

The interesting observation of Mellanby (2) and his co-workers may here be quoted. They found that deficiency of Vitamin-A was probably responsible for the easier development of sepsis and on that basis, treated their cases of Puerperal Sepsis with Vitamin-A, with surprisingly good results. It is well known that Vitamin-A deficiency leads to several infections, like Keratomalacia, Respiratory Infections and Gastro intestinal inflammations. Recent clinical investigations carried on at the Government Hospital for Women and Children, Madras, in the treatment of Puerperal Sepsis have also corroborated the conclusions of Mellanby and it would appear that an adequate supply of Vitamin-A is very essential as a prophylactic or curative of Puerperal Sepsis. It seems rational to presume that the endometrium, like the lining membranes of the respiratory and gastro-intestinal tracts and the cornea, is peculiarly susceptible to deficiency of Vitamin-A and thus favours infection.

The question naturally suggests itself—Why should there be a deficiency of Vitamin A in the pregnant woman and is such deficiency due only to a deficiency of the ordinarily available vitamin in the

diet? Prof. Hans Guggisberg of the University of Berne (3) has shown that the placenta acts towards vitamins just as with other food stuffs in regard to under-supply. In spite of unfavourable nutrition and insufficient content in the maternal tissue, the placenta acts with satisfactory results for the ovum. The foetus is first of all provided for, even if damage is caused thereby to the mother. Nutrition by the placenta thus shows its superior efficiency as compared with nutrition by the intestines. First the ovum; then the mother! Thus it is that in bringing forth a well developed child, the mother occasionally risks her life and makes the supreme sacrifice—an event not rare with certain species of the animal kingdom!

A statement has been made that the development of Sepsis is comparatively rare during pregnancy in cases of prolapse of the gravid uterus, while following delivery, a more or less severe form of sepsis develops. Here again, it may be mentioned that the foetal liver acts as a great store-house of Vitamin A, as also does the placenta. Could it be that this accounts for the resistance of the pregnant woman, while after delivery, deprived of both these store-houses, the parturient woman has to depend on her own reserves and consequently the Hypo-vitaminosis or avitaminosis leads to an easier infection?

Vitamins and Pregnancy. This leads us to the wider problem: what role do the vitamins play in pregnancy and parturition? The importance of an adequate supply of vitamins for ordinary growth and development of the individual is well known. That vitamins play an even more important role in the pregnant state is perhaps not so well realised. We have already referred to the vital part played by Vitamin A in protecting the mother from the incidence of sepsis. Vitamin C is necessary for the successful termination of pregnancy and the health of both mother and foetus. It affects both, in proportion to the severity of its deprivation, though the foetus and the new-born show less effects of the deficiency than the mother. (4) Vitamin D has been shown to be essential for the embryonic development of the chick and the fish. It would appear that the susceptibility of the new-born to Rickets can be lessened by adequate amounts of the antirachitic substance in maternal diet. It is a disputed question whether foetal rickets does occur or not. But there is reason to believe that congenital factors play a certain role in the origin of rickets. Under favourable conditions, the new-born child receives a certain reserve store of protecting substances which makes him more resistant to the damages of extra-uterine life. If the amount of vitamins in the maternal nourishment be poor, then the infant does not become directly ill. His resistance is lowered and his supply

of vitamins being small, it requires only a small damage to produce the illness due to Hypo-or avitaminosis. It is thus clear how important suitable nutrition and hygiene during pregnancy are to secure the health of the child. Two questions arise in this connection: Is it possible, by increased vitamin supply to the mother, to increase the reserves of the foetus? Are there any ill-effects brought about either to the mother or foetus by an excess of vitamin-supply, and if so, how can such effects be clinically noted?

The part played by Vitamin E in pregnancy may now be dealt with. Its role in the causation of sterility is now well recognised and it is therefore known as the anti-sterility vitamin. It is fat soluble and while it occurs in beef, milk, eggs and some of the vegetables (lettuce), it is found in concentrated form in the oil of germ wheat. The use of this vitamin in the diet has been proved to be of value in the treatment of primary sterility of unknown origin. It is also probable that deficiency of this vitamin is responsible for the earlier termination of pregnancy and for habitual abortion that occurs in certain cases.

This leads us to the importance of diet in pregnancy. The inadequate supply of vitamins in the diet of pregnant women does not require further emphasis. But the problem that awaits further solution is: What is the most suitable diet for a pregnant woman to take? And here unfortunately, hazy notions are prevalent and the popular opinion that the mother must be well fed, in fact over-fed, is perhaps responsible for some of the disorders of pregnancy. Experiments on animals have shown that a temporary reduction in nourishment has no bad influence on the germ glands. On the other hand, a lavish nourishment injures reproduction in a very extensive way and fat animals become sterile. It has likewise been suggested that over-feeding of pregnant animals tends to promote sepsis during the puerperium. Could a similar state of affairs occur in the human species? In another respect also, diet has perhaps a great part to play in the causation of disease during pregnancy. The Toxaemias of pregnancy have perhaps a bearing on diet and it is now felt that a salt-free diet is more beneficial in the prevention of this condition, and that there is not the same need to restrict the use of proteins.

The Endocrine system in relation to pregnancy.—Another great problem in Obstetrics has been opened up for research by the brilliant discovery of Zondek and Aschheim. It has been known for some time that certain of the internal secretions play an important role in the functions of menstruation, reproduction and growth, but the whole question has become very complicated by recent researches that have dimly shown the remarkable cycle of events that take place consequent on the action and reaction of one hormone on another and on the whole body. Zondek and Aschheim were able to demonstrate

the hormone of the anterior pituitary body in different tissues of the pregnant woman as well as in the blood and urine. On the basis of the fact that the anterior pituitary hormones appear in the urine of the pregnant woman a few days after the impregnation of the ovum, they have developed a method of early diagnosis of pregnancy by injecting a small quantity of the woman's urine into immature mice, thereby producing ripening of the follicle, corpus luteum formation and signs of oestrus as shown by cornified epithelium in the vaginal smears. The Zondek-Aschheim test is positive in 98 per cent. of cases. The reaction becomes negative about the 8th day after delivery. It has been found positive on the 9th and 12th day after abortion. It remains positive as long as living placental tissue is in biologic contact with maternal blood. A strong positive reaction is obtained in Hydatid mole and the reaction continues in cases of chorion-epithelioma, thus affording a valuable aid in the diagnosis of this condition.

It is seen that from the anterior hypophyses at least two hormones are elaborated which have a direct effect on the ovary (5). In the first place, we find the influence of the anterior pituitary 'ovulation hormone' in the development of a Graffian follicle in the ovary and the consequent elaboration of the "follicular hormone" which, in turn, stimulates the uterus to growth, turgor and the proliferation of the basal layers of the endometrium. The second anterior pituitary factor coming into play then causes a 'luteinisation' of the cells of the ruptured follicle and the formation of a second ovarian (corpus luteum) hormone which acts on the endometrium to produce the changes characteristic of the premenstrual phase, or in the case of gestation, to decidual transformation.

The other hormone of great interest to the Obstetrician and Gynæcologist is the "Female sex hormone". It has now been definitely demonstrated that menstruation is due to the female sex hormone. The ovary is responsible for the production of two hormones: (1) Estrin, otherwise known as "the female sex hormone", the estrous-producing hormone and (2) Progesterin, a specific product of the corpus luteum, also called lutin. The whole subject of Endocrinology particularly in relation to obstetrics is still under investigation that it is not feasible to dogmatise on the action of particular hormones on the structures which produce such hormones. Thus the complex relationship that exists between the placental, uterine, ovarian and pituitary hormones requires further clarification. Nor can it be easily settled why the thyroid undergoes hypertrophy in pregnancy and what are the hormones responsible for the glandular activity of the breasts after confinement. The part played by the Endocrine system in the causation of labour, in the intra-uterine death of the foetus; in the tendency for premature birth and in the

maintenance of the general health of the pregnant woman, are problems that await solution.

Toxaemias of Pregnancy.—Another interesting problem that has baffled solution so far is the causation of Toxaemias in pregnancy and Eclampsia has been aptly called 'a disease of theories'. Vogt divides the Toxaemias of pregnancy under six groups: (1) Hypertension Gravidarum, (2) Oedema of pregnancy, (3) Nephropathia Gravidarum, (4) Pyelitis Gravidarum, (5) The Dermatoses of Pregnancy, and (6) The Pernicious Anaemia of Pregnancy. This classification may not be acceptable to all, but in a measure, describes those severe conditions in pregnancy, the causation of which is still uncertain.

Perhaps the most important of these is the one grouped under Nephropathia Gravidarum. It is often asserted (6) that Pre-eclamptic toxæmia responds rapidly to treatment and that the development of eclampsia usually means culpable negligence on the part of the physician or the patient. That this is not true will be borne by Obstetricians who have had opportunities of observing a large number of cases. Occasionally, it has happened that despite all the usual rigid conditions imposed on the patient and due care taken, eclampsia has supervened and has even recurred in the same pregnancy. Nor can it be asserted that every case of Pre-eclamptic toxæmia presenting at an antenatal clinic can be assured of a cure and the prevention of the onset of eclampsia. Our own experience has led up to a careful prognosis in such cases for the first forty-eight hours, as it is impossible to predict the imminence of an eclamptic seizure in the presence of some of the signs of pre-eclamptic toxæmia.

The toxæmia can be divided into four groups:—(1) The renal type which is perhaps the commonest, wherein there occur, a high grade of albuminuria, increased blood pressure pronounced oedema, hæmaturia, epigastric pain, dimness of vision and occasional blindness; (2) The Hepatic type characterised by jaundice at times, but with a slight grade of albuminuria and a blood pressure which is not much raised, with little or no oedema; (3) The Hepatic renal type which is a combination of both; and (4) The cerebral type which is perhaps the most serious form of all. A factor of some significance is the difference in the mortality from eclampsia in different localities which cannot altogether be accounted for in the differences, if any, in the mode of treatment. The mortality in a large series of cases taken together has been near 10 per cent. at the Rotunda Hospital and in the Government Hospital for Women and Children, Madras, whereas the mortality at the Simpson Memorial Hospital, Edinburgh, and the Eden Hospital, Calcutta, has been much higher. There must be some other factor which influences the

higher mortality in Edinburgh and Calcutta, to take two instances, as compared with Rotunda and Madras.

Another point of significance brought out by Gibberd and Brown is the fact that Eclampsia may recur in subsequent pregnancies or at any rate, signs of renal damage may recur in subsequent pregnancies, although in the non-gravid state there may be no evidence of any renal damage. To this condition, the term "occult nephritis" has been aptly applied. It would appear then that toxæmia of pregnancy imposes such a severe strain on the kidney cells, that the renal threshold is permanently lowered. The lowering, however, does not impose an additional strain in the non-gravid condition, but when pregnancy supervenes and particularly in the later months the added stress of eliminating foetal and maternal excretions is too great for the low threshold renal epithelium to withstand. It follows that the longer the toxæmia is permitted to continue, the greater the damage to the kidney and therefore from the point of view of future pregnancies and the permanent damage that may result, the suggestion has been thrown out that termination of pregnancy is desirable, if the signs of toxæmia persist after a week's careful treatment.

Anæmias of Pregnancy:—Several observers have noted the fact that in the large majority of pregnant women, a fair degree of anæmia is present. A count of 3 million red cells with a hæmoglobin index of 60% is by no means infrequent. What the cause of this anæmia is, deserves further investigation. Secondary anæmia occurs in the pregnant condition, as in the non-gravid, due to such causes as ankylostomiasis, malaria, syphilis, tuberculosis and other infections. The importance of treating these anæmias at an early stage will be realised from the fact that no matter what the cause of the anaemia may be, a severe form of it leads to the possibilities of premature labour, rapid delivery, sudden death after delivery and in increased liability to puerperal sepsis.

A more serious form of anaemia which develops during pregnancy is known as "the pernicious anaemia of pregnancy". It develops in the second half of pregnancy generally, and has an insidious onset. Investigations carried at the Government Hospital for Women and Children, Madras, go to show that this anæmia is fairly common and differs from the true Addisonian type of Pernicious Anæmia in two respects—in the rarity of neurological complications (sub-acute combined degeneration) and in the absence of complete achlorhydria. A blood examination generally reveals the presence of normoblasts, megaloblasts, anisocytosis and poikilocytosis and the colour index is usually high. It may however be stated that recent investigations carried on at the Government Hospital for Women and Children lead us to believe that there are varieties of pregnancy anæmia and

that a high colour index need not necessarily be present in all cases. The subject requires further investigation. So far, liver therapy, blood transfusion, and vitamin diet have proved effective in the treatment of this condition.

Anaesthesia and analgesia in labour: Two problems of outstanding importance await solution, namely, the problem of painless child-birth and the problem of the safe anæsthetic in cases of operative delivery. Of these, the problem of painless child-birth is one which is becoming increasingly dominant. Obstetricians may feel certain that the demand for painless child-birth will be insistent and that the modern mother will not take it so philosophically that the curse on Eve should follow succeeding generations and that the Lord hath ordained "Thou shalt bring forth in travail". Nor will there be in the 20th century any protagonists of theology who would venture to raise a voice of protest against any drug or device calculated to promote painless child-birth, as did the clergy in the mid-Victorian era, who protested against the use of chloroform to alleviate the pangs of child-birth when Sir James Simpson made the discovery.

Two questions stand out prominently in this connection. What is the best and safest method of bringing about a painless child-birth? Which is the safest anæsthetic to be used in cases of operative delivery? It may be stated at once that several methods of promoting "painless child birth" have been advocated and are in vogue. The use of twilight sleep in labour is well known. Its limitations, however, are such as to preclude its use in general practice and its occasional failure together with a slightly increased risk to the fœtus, prevents its adoption as a safe and frequent method of promoting painless child-birth. Among the recent methods adopted are the "Gwathmey method", the use of Avertin and Percaine or Nupercaine. While all these drugs have their uses, it may be stated that a safe analgesic is yet to be evolved for relieving the pangs of child-birth.

The use of a safe anæsthetic during labour is much under dispute. Bethel Solomons has recently condemned the use as a general anæsthetic, of chloroform, while spinal anæsthesia has been advocated by some, particularly in cases where easy and quick dilatation of the cervix is needed. Records of intra-uterine pressure have been obtained by Alek Bourne and J. M. Burn showing the effect of anæsthetics on uterine contractions during labour. They found that chloroform and ether at once arrest the contractions in the first stage and diminish their force and frequency in the second stage. Gas and oxygen have no effect on the contractions during labour. Intra-spinal injection of Stovain does not inhibit the contractions but interferes with full relaxation between the pains. Morphia lessens the frequency of the contractions but the work done by the uterus is

probably as great or greater than before. Atropine appears to stimulate the contractions but quinine has very little effect.

The increased use of local anæsthesia in Obstetrics is to be commended. Direct infiltration is far safer than spinal anæsthesia. Epistotomy, low forceps, and Cæsarean section can readily be done under infiltration anæsthesia.

The teaching of Obstetrics.—A problem of a different nature, but one which presents many difficulties and a proper solution of which is calculated so much to lessen maternal mortality and morbidity, is the problem of training the undergraduate and graduate in Obstetrics. The importance of this subject will be evident to those who have read the comprehensive survey of obstetric training in the different teaching centres presented by Comyns Berkeley (7) in his Lloyd Roberts Memorial Lecture at Manchester in 1929. The same subject has been dealt with, with reference to conditions in America, by Findley and Holmes in their communications to the White House Conference already referred to. And lastly a very striking paper was read by Prof. Gammeltoft, Professor of Obstetrics at the University of Copenhagen on the Principles of teaching in Obstetrics and Gynecology at the Eighth Congress of Obstetrics and Gynecology, held in Glasgow in April 1931. Speaking of the fight against the incidence of a high maternal mortality and morbidity that is now carried on in all civilised countries, the professor says, "But the central point, the pivot of all concerted action in this fight, is certainly the teaching of Obstetrics. If we are to have any prospect of really being able to reduce the mortality of mothers and children, it is primarily essential that the instruction given to students in this all-important subject should be of a much higher standard than has been the rule up to now."

Prof. Munro-Kerr in the course of the discussion remarked; "It is no use to tend carefully the pregnant woman and bring her to labour in a satisfactory state of health, if during the delivery she is injured or infected. It is dreadful to think that the young graduate may, the day after he qualifies, be called upon to perform a serious operation, that he has never before undertaken, may not have assisted at, or possibly even seen. We should be perfectly clear on this point, that we cannot undertake to train the undergraduate in anything but the very simplest obstetric operations. Maternal mortality and morbidity will never be reduced appreciably until obstetric practice is carried on by well-trained midwives, obstetric specialists, and general practitioners specially trained in Obstetrics after graduation." A wiser counsel was never given to those interested in the teaching of Obstetrics!

The general formula insisted on by the General Medical Council that every student should attend and conduct personally the delivery

of twenty cases, may mean so little that it may be but a screen to obstetric ignorance of a colossal magnitude! And when such graduates settle down as general practitioners and practise Midwifery, the results cannot but be disastrous.

Three things seem to be essential in the training of an undergraduate in Obstetrics (1) A large maternity institution (one with an annual confinement rate of 1,500 cases at least) where a variety of abnormal labours and complications of pregnancy and parturition can be observed (2) Practice of Obstetrics in the home of the patient and witnessing occasionally abnormal labours conducted in the home to familiarise the student with the different conditions of home and institutional midwifery; and (3) A clear realisation at the end of the training by every student of his ignorance of and incapacity to tackle operative and difficult labour until and unless he puts in a further period of practical study as an interne for at least six months at an obstetric teaching centre. These conditions may seem rather exacting but they are very essential and it has been my practice to conclude my lectures with the paradoxical statement that if the undergraduates have learnt enough midwifery to realise how ignorant they are of practical obstetrics and how dangerous it would be for them to practise it at that stage and with that knowledge, I would feel happy that they have learnt something and I had taught them something worthwhile.

It is impossible within the limits of a single contribution to dwell on the many problems that present themselves to the Obstetrician for solution at the present day. The problems of Obstetrics are the problems of life and death, the genesis and finale of existence! But apart from these grand problems, many minor ones of immediate interest crop up. To discuss the problems of placenta Prævia, Vesicular Mole, Ectopic Gestation, Prematurity, Ease of delivery, Congenital anomalies, Habitual death of the foetus, is to plunge into a whole field of surmises and suggestions. Nor can the Obstetrician in the Tropics forget that a whole field of fruitful research lies ahead of him in unravelling the effects of Tropical Diseases on Pregnancy and Parturition.

Research in the field of Obstetrics to-day is a national necessity and collaboration of the research worker in the laboratory and in the clinic is essential. So also is there need for the co-operative enterprise of the researcher in the basic sciences and the specialist in the obstetric field. And as a national problem, it behoves the Governments of all countries and the Universities and kindred bodies to show their practical interest in this field by a wise encouragement, through research studentships, fellowships and similar endowments, of those interested in such activities. Is it too much to hope that such help will be forthcoming from the Central and Provincial

Governments in India towards the solution of those grave problems, which, when solved, will tend to promote as nothing else can, the physical well-being of the nation and its increasing prosperity.

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THE MODERN CONCEPT OF OBSTETRICS.

BY

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OBSTETRICS or the art of Midwifery is probably as old as the hills. When women first appeared on earth, then was the dawn of Midwifery. But though it is so old, progress in the study of this subject commenced only towards the beginning of the last century. In India, in ancient times, there might have been some advance in the knowledge on this subject, but it decayed in course of time and this subject was handled by a class of hereditary midwives, the barber midwives, who from the traditional knowledge handed down to them did their work as well as they could. Even in a country like England, which is one of the advanced countries of the day, the "science" of Obstetrics is barely half a century old. It was only as late as 1886 after the passing of the Medical Act that it was deemed necessary for a practising physician to have a knowledge of Midwifery. Only after 1902 was it made compulsory for Midwives to have special training. In India, today, any person can attend a woman in labour. About 15 years ago when Midwifery was taught to us, we learnt more about the various complications of pregnancy and labour, than about its normal course. A belief was fostered in us, that pregnancy and child-birth, though physiological processes, bordered on the pathological, and the study of the pathological was all-important. The idea that these were essentially physiological, and that it must be our aim to maintain this physiological state, is comparatively a recent one.

The modern concept of Obstetrics is to maintain this physiological aspect; to see that child-birth is shorn of its terrors; to reduce

to the barest minimum mortality from such causes as Puerperal Fever, Toxaemias of pregnancy, Hæmorrhages etc., to prevent the subsequent complications that arise and form a large part of gynaecology. Injuries of the genital tract, malpositions of the uterus, injuries to the bladder and rectum, inflammation of the pelvic viscera and their after-effects form a large part of the work of the gynaecologist. A deeper study of the processes in the pregnant, a closer investigation about the role of diet and environment, on the resistance of the maternal organism to adverse factors, a more thorough knowledge of the foetal and maternal metabolism, which perhaps in no other condition is so active, is necessary for the understanding of the nature of pregnancy and its complications. Measures meant to relieve her of excess of pain and suffering; ways of assisting her to deliver naturally, without active manipulative measures however skillful they may be—these are more important than knowing how to put on forceps. There is no gainsaying that the various operative procedures and the skill and tact in carrying them out, do comprise an important chapter in the study of Obstetrics, but the pendulum has swung in the opposite direction and the Obstetrician who can, by timely advice, by proper ante-natal care, by due watch during child-birth and puerperium, bring about a natural though "uneventful" delivery is a greater success than the other who is able to deliver by high forceps, version, or Caesarean. One who takes heroic measures to treat puerperal complications like sepsis, is less preferable, I would consider, to one who can avoid these complications. The subject from this aspect is not so simple as it seems. Unless you have a thorough knowledge of puerperal fever, its etiology and pathology, measures taken for its prevention will not be satisfactory. Unless the processes, physiological and pathological, are studied with meticulous care, the physiological nature during pregnancy, child-birth and puerperium cannot be maintained.

With the spread of education on health subjects and with greater expansion of female education, time will surely come when woman will demand adequate protection for her, in the discharge of a function of the highest value to the society she belongs to, but which nevertheless is not individually so indispensable to her as other functions like digestion or respiration. Men will refuse to believe that their mothers, wives or sisters are destined to suffer and therefore must undergo untold hardships and sometimes even forfeit their life in the cause of child-birth not because it is any fault of theirs, but in the discharge of a natural function of the utmost importance, that is, entering into motherhood, a state of dignity and sanctity but which is apt sometimes to end in disaster. When a girl entering into motherhood is entrusted to the doctor's care, a heavy responsibility lies on him. An

upto-date knowledge of the complications and their prevention is demanded from him, and silently and unnoticed he has to guide and steer her, avoiding the shoals until she is blessed with a child.

Another change in the modern concept of this subject is that it is not supposed to be entirely a concern of an individual alone to look after his wife during her pregnancy and child-birth. Since proper attention during this period will result in healthy mothers and healthy offspring and since the latter are the future citizens of the State, it is being realised more and more that it is as much the concern of the State to ensure to all women under their protection, rich or poor, adequate attention and assistance during pregnancy, child-birth and puerperium. Legislation for the care and health of pregnant women working in factories, maintenance of proper standards of education amongst nurses and doctors, establishing clinics in all places for adequate advice and assistance during pregnancy and child-birth, are considered in these days the primary as well as the elementary duty of the State and the Public Health Department is concerned, as much as curative institutions like hospitals, in the practical application of obstetrics.

A doubt may arise among the readers if in our country this modern concept is applicable, a country rich in population, but teeming with ill-health, epidemics and poverty, a country where there is not much difference between semi-starvation and an average meal, and whether the heavy infantile and maternal mortality is not a blessing in disguise in keeping down the population. No greater fallacy exists. It is not solely the most unfit that die, for every one that dies dozens are left in a state of chronic ill-health, and if the maternal and infantile mortality is high, it only follows that a higher number of mothers and infants have to live in a state of chronic ill-health. Maternal mortality in England has been the subject of numerous enquiries. In India, need it be said it is higher still? The place of the mother in the family and her untimely loss must be considered in its practical aspect, as it means very nearly the wrecking of the home. In the old text-books there was not a word on this subject, But the days have changed, though far more time is still being given in the teaching institutions for the treatment of various complications so that the medical student is apt to go away with the idea that the chapters on antenatal care are only of secondary importance.

Obstetrics is being considered a more and more important subject in the curricula of studies and is regarded as a major subject by itself. The ultimate aim of the study of Obstetrics should not be lost sight of. It is primarily to assist in the bringing forth of healthy offsprings to take the place of the older generation who will be passing away; and in this process, to see that the mother is hurt least or not injured at all. While the life of the mother is more precious

than the life of the infant, far more value is attached to both these days than formerly. There is a huge waste of human life in the form of abortions and neonatal deaths, the former are nearly as much as 15 to 30 percent. of the total confinements and the latter constitute nearly 20 per cent. of the total infantile mortality. Whereas in the old days, our knowledge of abortion was essentially how to treat it and whereas neonatal deaths were considered as inevitable, the modern view is to study more and more the physiology of pregnancy and labour and the pathology of birth (traumas), so as to take proper measures for their prevention.

What a mother's feelings are when after undergoing the various discomforts that might arise during pregnancy, and after bearing silently and patiently the pangs of a protracted labour, she is told that her child is dead but that her life is safe, has not been described; nor even a passing mention made in the text-books as if the mental life of the woman does not exist, nor is worth our consideration unless there is definite breakdown in the form of neurasthenia, hysteria or even insanity. But those days are past. Woman has begun to protest, to protest vehemently though in a somewhat veiled manner. From what I know about them, they are not enamoured of child-birth and will refuse to have a baby or will try to prematurely terminate her conception, as can be seen from the rising number of abortions in Germany, Russia etc., one writer even going to the extent of saying that in Germany abortions nearly equal the total number of confinements. And unless the modern view of obstetrics, the view that it is our duty to make pregnancy and child-birth as safe as possible to the mother and child by maintaining its physiological aspect, is well impressed on those who are responsible to carry forward its teachings, the women in India will, as they are doing in France, shirk the responsibilities of motherhood.

The end-view of Obstetrics must be not only to bring about a certain result but also to maintain it. This aspect is often lost sight of. Imagine the period of pregnancy, confinement and puerperium. Imagine the mother anxiously co-operating with the doctor and passing through a period of ten months, and should her infant unfortunately die soon after, all the mother's trials and the Obstetrician's work is in vain. Hence, greater attention must be paid to pediatrics which does not merely mean the art of treating sick children but includes the study of their physiology, their growth, their physical and mental development, so that the child is protected from adverse influences till it is old enough to be handed over to the school doctor who will look after him till he passes out of school life.

Hence, Obstetrics, if properly understood, must be a link in a chain—departments of Obstetrics, Pediatrics, Public Health measures

and special medico-surgical clinics—our object being to produce sturdy seedlings for the race and for their fostering care from the day of their conception, till they see the light of day, pass through the tender period of infancy and childhood, and into boyhood, adult life and old age, and then allowing the cycle to repeat itself. This conception may appear at first sight to be too idealistic, but it is not so. The days of nonchalance till actual breakdown of health occurred, when only active measures are taken, are gone. These are the days of prevention. This aspect of Midwifery is not spectacular, is less likely to be met with cheers and approbation whereas the curative aspect is more spectacular, more impressive and more easily appreciated by the individual. Though it is silent and unostentatious, it will lead to greater health and happiness among the people.

A FEW COMMENTS ON THE OBSTETRICAL METHODS.

BY

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I will not undertake to report any original work, but will merely comment on recent attitude towards various obstetrical procedures, especially in America.

The old teaching of early interference and hastening of labour in eclampsia, which still taught in Vienna, is not practised in America. On the other hand in the pre-eclamptic stage, when patients do not respond to treatment, most practitioners believe in terminating labour,—preferably by induction and spontaneous labour. They believe prophylaxis is to be almost one hundred per cent efficient in preventing eclampsia. An English authority, Bourne, supports the above attitude regarding interference in the following figures:—

Type of Case.	Severe.	Died.	Mortality %
Natural Delivery	39	8	20.5
Induction and Spontaneous Labour	24	5	20.8
Low forceps	51	17	33.3
Cæsarean	37	16	43.2
Accouchment Force	10	6	60.

Thyroxin 2 cc. is suggested in Vienna for use in eclampsia.

Gwattimey, a form of anaesthesia, is much talked of and much used in America. It is very useful especially in a prolonged first labour. Aether 2 fl. ozs., Alcohol 3 fl. dr., Quinine hydrobromide 20 grains, and mineral oil 4 fl. ozs., given rectally about midway through the first stage may help one to avoid harmful interference and conserve the patient's strength and nerves. If the pains are not extremely

severe the patient sleeps through several hours of labour. But, as with morphine, if labour is progressing so rapidly that it may be expected to terminate in two hours, it should not be used, as the baby might be resuscitated with some difficulty. If bearing down pains have started, it will not be retained, so is useless.

We have been asked whether in case of a moderately contracted pelvis in primipara in which the head does not engage at the expected time, the X-ray would not be useful to determine whether a Caesarean is necessary. In the Stanford Medical School, California, they do accurately measure the disproportion between head and pelvis by X-Ray, but this requires a stereoscope which we do not have at present in Vellore.

Thyroid is still the most effective internal secretion on the market, although recently ovarian extract has been standardized by mouse units,—the amount sufficient to produce vestral changes in the mouse as evidenced by smears from the original discharge of the mouse. One of my former associates, Dr. Della Drips has been working on this.

Insufflation of tubes for sterility has been used a great deal. Where no tubal or cervical inflammation exists, there is no danger. It has been used 1,000 times in Vienna with no bad results. The patient is prepared as for vaginal operation and air is pumped in through the cervix slowly at a pressure not exceeding 200 mm. of mercury, to prevent rupture of the Fallopian tubes. If the pressure does not rise at all it means that the tubes are patent and the air is freely passing through the ostia into the abdominal cavity. One can hear a gurgling noise with the stethoscope to the abdomen, and shortly after this the patient often complains of pain in the shoulder as the bubble rises to a point under the diaphragm. If the pressure goes gradually up to a point near 140, for example, and then suddenly drops, it means that the tube was closed at first and was opened by the air pressure.

The following figures were obtained in Vienna:

Sterility is due to tubes in 54% of cases. There is no use in using this procedure on a patient who is childless due to repeated abortions or to a hypoplastic uterus. Of 376 sterile women, 167 had patent tubes, and 166 closed tubes, and of the latter more subsequently became pregnant. Of those closed at first 43 opened later and 32.6% of these became pregnant. The patent tube cases of course also came because of sterility and of these 14.4% became pregnant later. The examination may be repeated two or three times later, eight or ten times after menstruation.

The apparatus used is exceedingly simple. Mine was bought for twenty five dollars \$ (25.00) in the United States, and can be carried around in a small bag. An instrument however, could be improvised

with a small conical cork carrying the inflating tube, being made to fit tightly into the cervix, and the tube could be attached to an ordinary manometer on the end of a T-tube and a bulb for inflating with air on the other end. Carbon di oxide need not be used as the inflating gas, as was always formerly done.

We have not a large enough series at Vellore to report, but we find a very large proportion of sterile women with normal menstrual periods, have closed tubes. Insufflation may be therapeutic and is at any rate a valuable preoperative diagnostic procedure.

Two cases of puerperal sepsis involving a femoral phlebitis may be of interest,

Case I: Seethammal was admitted to the septic maternity ward ten days after delivery. She had a history of nine pregnancies, with six living children after losing the first three in infancy.

She had a normal delivery by a barber woman and was all right for five days, except for pain and slight swelling in the right leg which she had suffered during the last two months of pregnancy. The leg pain and swelling increased and she had fever, nausea, loss of appetite, and sleeplessness, increasing daily. She was admitted the tenth day post partem in a state of semi-delirium, temperature 103.6, pulse 144, respirations 36. The uterus was moderately subinvolved and there was a purulent discharge from the vagina. The bowels were loose. The right leg was swollen up to the knee, especially over the ankle, which was also red and shiny. The tibia itself was enlarged. The thigh was slightly swollen and tender along the course of the femoral vessels. The skin over this area was infiltrated and red with a raised margin. The lungs showed patches of consolidation with fine crepitant rales. The patient's general and mental condition improved temporarily under constitutional treatment and iodine intravenously. The infiltrated skin of the thigh extended its borders rapidly and developed blisters. These later became gangrenous. She was discharged almost moribund the seventh day after admission.

The laboratory findings were as follows: Urine showed albumen and granular casts, Leucocyte count 11,400.

X-Ray showed osteomyelitis of right tibia and thickening of the periosteum.

Unfortunately blood culture was not done. The case was of interest from the standpoint of differential diagnosis. Phlebitis Osteomyelitis and erysipelas were all present. The osteomyelitis was chronic in character before delivery and I believe, syphilitic because of the periosteal thickening, but it confused the clinical picture of the acute process. Before the erysipelas developed, the question arose as to the need of treating the case as one of acute osteomyelitis.

Case II: Mrs. C. 4th para was admitted to the labour ward about an hour after labour started, with membranes in tact. She had fever and three chills at home before admission. Delivery was normal and easy after about six hours. No vaginal examination nor internal manipulations of any kind were performed. Placenta and membranes were expelled in tact, apparently. Temperature rose to 100°F the afternoon of delivery, was 100 on the third day and 103.6 the fifth day from which time she had chills either daily or twice daily—she looked very ill and had a fine tremor of lips and hands, but insisted that she felt well. Iodine and glycerine drain was given on the sixth, tenth and fifteenth days post partem, although the uterus was not subinvolved nor tender. There was slight tenderness in the right fornix with slight fixation and drawing of the uterus to the right.

The laboratory returned a diagnosis of malignant tertian malaria at the end of the first week. Four intravenous quines of 2, 3, 4 and 5 grains respectively were given with no effect on the temperature. The leucocyte count at the end of the second week was 21,800. The widal was positive 1 in 50—negative 1 in 100—Blood culture the third week was positive for staphylococcus. Only on questioning did she complain of a little abdominal pain, which seemed quite general with no localizing tenderness. Bowels were normal. The temperature ranged from 103 to 106 with occasional chills for two months with a maximum pulse of 110 to 130, occasionally going a little higher. The temperature dropped to 100 and 102 for three weeks preceding her death and the pulse gradually mounted to 150 to 160. She complained of pain in the thigh in the third week and later developed marked swelling of right leg and thigh with tenderness over the femoral vein and renewed chills. Later the left leg became also involved, and toward the end she developed very bad bed sores and a cough. She always had a good appetite and digestion with abdominal distention occurring only a few days before death, at which time she became semiconscious.

Autopsy revealed a purulent phlebitis of both femorals and the inferior vena cava as far as the entry of the renal veins. These veins were full of liquid pus and contained no blood at all. Embolic abscesses were found in the lungs but none in kidneys, liver or other organs. An abscess was present in the right ovary. The parametrial tissues were not thickened and adnexas appeared normal until the ovary was brought up into view. There were no adhesions. The uterus was normal in appearance and size. The diagnosis at autopsy was purulent phlebitis of both femorals and inferior vena cava with embolic abscesses in lungs, probably originating from abscess of right ovary and terminal broncho-pneumonia.

PELVIC DISPROPORTION.

BY

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As this is to be a discussion from the clinical point of view I have refrained from going into the historical aspect of the subject.

This was the subject for discussion at the British Congress of Obstetrics in 1922, when valuable contributions were made by eminent Obstetricians—papers well worth a careful study.

Later in the same year Fitz-Gibbon wrote an exhaustive article on the same subject.

I have in the following pages endeavoured to give you all, the results of my own short experience while drawing freely on the excellent papers mentioned above.

I have selected a few typical cases out of my group as illustrative of the points I mention.

The term "contracted Pelvis" signifies an absolute condition and may be reserved for definite reduction in the capacity of the pelvis.

Fortunately the incidence of this is not very high (I speak for this part of India), and I feel, can be further reduced by improved methods of living. For rickets and Osteomalacia, the commonest causes of badly contracted pelvis are purely preventable diseases. So also might the generally contracted type be with the introduction of compulsory physical culture exercises in Girls' schools.

The majority of cases fall under the group of minor degrees of contraction and for these the term "Pelvic Disproportion" is most suitable, as in these it is not the fact of absolute measurements but of the relative sizes of the foetal head and pelvis which are of prime importance.

The incidence of this type has been noted to be already higher in recent years. It may be that in the early days of the service of Obstetrics more attention was concentrated on the major degrees of contraction; and moreover it was only in difficult cases and in extremes that medical aid was sought for.

Later when obstetricians began to get the opportunity of observing cases from the beginning of labour or even from the Ante-natal period, the problems of disproportion presented themselves.

It is also possible, as suggested by Fitzgibbon, that the intermingling of races has increased the incidence.

A pelvis may be small compared to the average type but if the foetal head passing through the particular pelvis is also proportion-

ately small, there is no difficulty and that pelvis may for practical purposes and for the time being be considered normal.

I say for the time being advisedly as experience has shown that disproportion may show itself in a subsequent pregnancy where the former labours were normal. This is due to the fact that subsequent babies are often bigger and particularly so if a boy follows a girl.

There is no definite standard size of pelvis laid down for India. As a matter of fact, India is so vast and has such a diverse collection of humanity that it will be difficult to lay down one fixed standard. There is much field for work in this direction. In 1925 Miss Stapleton published a note on "Pelvic-Measurements in Indian Women" based on 200 cases, and her averages were Interspinous 8.67"—Intercristal 9.69"—External conjugate 7.22" with an average sized baby of 5½ lbs. In her series the promontory was reached in ¾ rds of the cases.

My R. M. O. Miss Telang investigated a thousand consecutive series of cases admitted for labour at the Cama Hospital and her findings were as follows:—

Small type	I. S.	8	I. C.	8¾	E.C.	6½—47%
Medium type	I. S.	9	I. C.	9¾	E.C.	7 —16%
Large type	I. S.	9½	I. C.	10½	E.C.	7½ —37%

Average size of baby in each type:—

Small—5¾ lbs., Medium—6 Lbs., Large—6½ lbs. Largest baby through the small pelvis—6½ lbs.

Taking off the grossly distorted pelvis, out of 470 small pelvis only 15 or about 3.2% presented problems of disproportion, showing that the small type is a fairly common average normal type. A later investigation by Mrs. Desai of 300 consecutive cases gives the following figures:—

8 —9	—5½	.....	12%
8½ —9½	—7	.....	31.3%
9 —10	—7	.....	33.7%
9½ —10½	—7½	.....	20.7%
10 —11	—8	.....	2.3%

The discrepancy in the two series is probably due to a preponderance of certain castes—a much larger series will need to be taken and an average worked out for different castes and communities. Mrs. Desai in her investigation particularly noted the capacity of each pelvis.

Of the pelvis with smaller measurements, only in 42 out of 130 was the promontory reached.

In 12 cases the D. C. was 3¼" of these only two were abnormal. There were 4 with D. C. 3½". Three of these ended normally and

one was abnormal. Thus giving a percentage of 2.3 abnormals in the pelvis with small measurements. In the medium sized pelvis the promontory was reached in 19 cases—one of these had a D.C. of $3\frac{1}{2}$ ". The case ended naturally with a still-birth. In the large sized pelvis the promontory was not reached in any.

A general survey of the cases of contracted pelvis admitted at the Cama Hospital shows a high proportion of Osteo-malacia mostly amongst the Mahomedans. The generally contracted type with often some flatness added on stands next in frequency and here again the Mahomedans preponderate.

Investigation.—Falls under two headings:—

A. Factors which indicate disproportion in the Ante-natal period.

B. Factors which indicate disproportion during labour.

(A) A regular ante-natal examination during the later months particularly gauging the size of the head against that of the pelvis is essential. According to Fitz Gibbon, 80% of these women conform to the normal type. An inquiry into the family type on both sides is often instructive.

Case No. 8. Past obstetric history may be very helpful but it must be remembered that disproportion may show itself in subsequent labours, e.g. in a flat type of pelvis, if the occiput gets to the less roomy side, disproportion will be noticed during that labour. Actual measurements as such are not so much of a guide as the relation between the conjugate and the transverse diameters.

The most important investigation during the Ante-natal period, is noting the *relation of the head to the brim*. In this particular field we owe much to the Edinburgh and Glasgow Schools. You will all remember Barbour's aphorism—"The foetal head is the best pelvimeter".

Munro Kerr has described an elaborate method for estimating the size of the head against the pelvis, and Bethel Solomons has developed a special manœuvre. Non-fixation of the head near term in a primipara, and definite overlapping are signs which must not be overlooked. It must be borne in mind however that posterior positions often increase seeming disproportion.

Full ante-natal examination as above must be made about the 36th week as that being the time of election, the question about the advisability or otherwise of inducing premature labour will need to be fully discussed. The type of case we have under consideration will present few problems in the ante natal period but all one's judgment will be fully tried when the patient gets into labour.

(B). All first labours are trials. Diagnosis can at times only be made after labour has been in progress some time.

Several factors have to be taken into consideration during a proposed trial labour.

Case No. 3. (1) The uterine force.

This is a very uncertain factor which may considerably help or mar the prospects of a good trial.

It is not possible to foretell which patient will go in for inertia, apparently healthy looking women may have inertia whilst a feeble looking woman may get good contractions and being a trial to a successful termination quite to one's surprise.

What determines effective uterine contractions still needs fuller investigation. There is probably an underlying Bio-Chemical factor. Primary inertia is commonly associated with generally contracted pelvis.

(2) *Relation of presenting part to brim.* Fixation or overlapping may be noticed but this has to be interpreted in the light of the particular type of pelvis presented.

Case No. 11. In the generally contracted type there is resistance throughout which is if anything, increased at the outlet, therefore even if the head seems fixed the case may end less happily than in a flat type where there may be definite overlapping.

(3) Manner of descent.

Case No. 8. Extreme flexion with posterior fontanelle presentation, imperfect flexion leading to anterior fontanelle presentation and asynclitism, particularly posterior parietal presentation are all indications of disproportion. The latter is particularly noticeable in a case of flat pelvis where further progress is impeded.

(4) Consistency of the foetal head will play a large part in deciding the course of labour. Boys are found to have harder heads and as the size is said to increase with succeeding pregnancies, a labour may be extra difficult where a boy follows a girl.

(5) Caput formation and

(6) Moulding-occurring at any time must be looked upon as evidences of disproportion, but occurring early in labour before full dilatation occurs, are a sign of excessive disproportion.

(7) Manner of dilatation and taking up of the cervix. Fitz Gibbon gives a good summary of his observations and deductions which any one can verify in her own practice.

(a) Bag of membranes though large is rounded and dilatation is even—good prognosis.

(b) Bag of membranes glove-like-dilatation imperfect and never complete—bad prognosis.

(c) Bag of membrane absent—cervix crowning head—good prognosis.

(d) Bag of membranes absent—cervical canal empty and less than 2/3rd dilated—bad prognosis,

(8) Retraction ring.

The level of retraction ring indicates amount of work done.

Management of trial labour. Careful ante-natal work will mark down certain cases for special observation,

Depending on the type of pelvis and various other factors already mentioned. Cases with marked overlapping will be seen to deliver themselves normally whilst others with seemingly less disproportion will need major operative procedure.

The introduction of the Lower Segment Cæsarian Section has revolutionised the practice of midwifery and made it possible for many cases of disproportion to be watched as trials, which would perhaps have had premature Cæsarians.

Amand Routh's investigations showed that classical Caesarian performed early in labour gave less than 2% mortality; this rose to 10% if performed after rupture of membranes whilst it reached as high a figure as 33% if performed after attempts with forceps etc.

Cases Nos 8 & 9. The prognosis with Lower Segment Cæsarian is found to be good even when the operation is done late in labour. *Plan to be adopted in a trial labour.*

1. Ensure a normal vertex preferably a vertex anterior in later weeks of pregnancy.

2. Examination early in labour—note manner of dilatation and taking up of the cervix.

3. Once it is decided to watch the case as a trial, give an injection of Morphia Gr. 1/6 with Atropine. This quiets the patient and ensures quiet dilation within a fairly short time. The co-operation of the patient goes a long way towards success.

4. Buist's pad if necessary and the patient to lie on the side of the occiput.

5. The next examination is made after rupture of membranes.

Fitz Gibbon's summary is again, most instructive.

(a) Os fully dilated head engaged—normal labour.

(b) Os fully dilated—head high—may yet descend (ensure full flexion).

(c) O's 2/3rds dilated—cervix crowning head—good prognosis.

(d) Cervix reformed Vaginal portion—will need Cæsarian.

In cases (b) and (c) a further four to six hours may be allowed all the while watching the condition of mother and foetus. Some of these may deliver normally.

No.	Caste.	Age.		REMARKS.
1	M	17	L. O. P. not fixed manual utes.	1. Value of timely flexion. 2. Rapid passage of head once resist- ance at brim overcome.
2	M	26	not fixed. os nearly fully 2 hours later membranes	Resistance at brim only, as size of baby small.
3	M	18	ad not fixed. os one finger membranes. os 2 fingers— etal lower. Strong pains 2	Was being prepared for Cæsarian as no pain when membranes ruptured.
4	M	29	iliac fossa. os 3 fingers— head brought over brim— ivered in one hour.	All points on admission in favour of Cæsarian Section but rectification and stimulation of contractions obviated the necessity for such.
5	...	21	pains 2 days. Head not varian Residue instead of t—Morphia. 15 hours later adths above symphysis—3 f.b. os nearly fully dilated hours after above. N. D. ately slight moulding and	1. Illustrates the value of watchful expectancy. 2. Note continuous resistance through- out pelvic cavity.
6	M	25	ed. When os fully dilated— ad not fixed—much mould- traction ring 2 f.b. above Walcher's position—failed. s—satisfactory.	1. Occiput seems to have got to the narrow side. 2. Marked moulding even before rupture of membranes—should have been enough warning and not more than 2 hours need have been given after rupture of membranes. 3. Tentative attempts with Forceps in view of past history.
7	M	20	apping. Seen when fully head not fixed cervix fall- ter— head at brim—caput Cæsarian.	Illustrates how cervix falls together if the head does not descend.
8	H	22	fixed R. O. P. membranes quist's pad. 17 hours later he dilatation head floating— caput formation. Lower	Occiput was posterior and to the less roomy side.
9	M	22	rtex. membranes ruptured still unfixed—os 2 fingers. liquor. Pains strong retrac- s—much moulding. Lower	Delay in treat ment was due to very stubborn relatives. Note rising retraction ring without further dilatation of cervix.
10	M	32	no overlapping bag glove- r bag rounded below—os 2 rs later. Pt. tired. bag rup- quor head—tightly jammed hers—failed. F.H. stopped.	The glove-like bag should have been taken as an early warning and the idea of full trial abandoned Cæsarian section would have been the right treatment.
11	M	25	not well flexed—os fully 3 hours later same level ruptured artificially—head gress 2 hours. Forceps in	Marked disproportion though head fixed.
12	M	22	t fully dilated—membranes traction ring in 3 hours. hers child asphyxiated—	Had been advised induction of premature labour.
13	M	20	ure rupture of membranes— dilatation—marked mould- covered.	A very borderline case.

CASES OF PELVIC DISPROPORTION: MISS. J. JHIRAD, M.D.

No.	Caste.	Age.	Parity	Past History.	Measurements.					Type of Pelvis.	Treatment.	Result.		NOTES.	REMARKS.
					I.S.	I.C.	E.C.	D.C.	P.O.			M.	C.		
1	M	17	I	.....	9½	9½	6½	4½	3½	Ricketty Flat.	Trial N. D.	L	L 6 lbs.	In labour 24 hours. Persistent L. O. P. not fixed manual flexion. Head descended in 15 minutes.	1. Value of timely flexion. 2. Rapid passage of head once resistance at brim overcome.
2	M	26	II	1st Instrumental S. B.	8½	9½	6	3½	3	Generally contracted Flat.	Trial N. D.	L	L 5 lbs.	Admitted in labour. L. O. P. not fixed. os nearly fully dilated—big bag. Strong pains 2 hours later membranes ruptured and head fixed.	Resistance at brim only, as size of baby small.
3	M	18	I	.....	8	8½	7	4	3	Generally contracted Flat. Promontory prominent.	Trial N. D.	L	L 5½ lbs.	Admitted early in labour. Head not fixed. os one finger dilated. Morphia—after rupture of membranes. os 2 fingers—head in brim L. O. A. Post. Parietal lower. Strong pains 2 hours later. N. D.	Was being prepared for Cæsarian as no pain when membranes ruptured.
4	M	29	IV	3 F. T. N. Ls.	9	9½	7	4½	3	Osteo malacic slight Beaking.	Trial N. D.	L	D 4½ Prem.	Admitted in labour. Head in one Iliac fossa. os 3 fingers—no membranes—small caput. Head brought over brim—binder—Strych. and Atropine—delivered in one hour.	All points on admission in favour of Cæsarian Section but rectification and stimulation of contractions obviated the necessity for such.
5	...	21	II	Tedious L.	7½	8½	6½	4	3½	Generally contracted.	Trial N. D.	L	L 6 lbs.	Membranes ruptured prem: no pains 2 days. Head not fixed. Medical induction—using ovarian Residue instead of Pituitary. Started pains same night—Morphia. 15 hours later retraction ring rising 2½ finger-breadths above symphysis—3 hours after above retraction ring 4 f.b. os nearly fully dilated. Pt's condition good. f.h. good—4 hours after above. N. D. slight P. P. H. baby cried immediately slight moulding and hardly any caput.	1. Illustrates the value of watchful expectancy. 2. Note continuous resistance throughout pelvic cavity.
6	M	25	III	1st & 2nd Forceps babies born alive.	8½	8¾	6½	4½	3	Ricketty generally contracted Flat.	Trial & Lower Segment Cæsarian.	L	L 5½ lbs.	Admitted in labour. Head not fixed. When os fully dilated—bag tense ruptured artificially. Head not fixed—much moulding—5 hours later—Pulse quick. Retraction ring 2 f.b. above umbilicus. High Forceps tried in Walcher's position—failed. Lower Segment Cæsarian—Progress—satisfactory.	1. Occiput seems to have got to the narrow side. 2. Marked moulding even before rupture of membranes—should have been enough warning and not more than 2 hours need have been given after rupture of membranes. 3. Tentative attempts with Forceps in view of past history.
7	M	20	II	1st Premature osteo malacic pains 3 years.	8½	9	7	3½	3½	Osteo malacic no Beaking.	Trial & Cæsarian.	L	L 6½ lbs.	Watched as A. N. C. no overlapping. Seen when fully dilated—bag ruptured artificially—head not fixed cervix falling together. Morphia—3 hours later—head at brim—caput forming—cervix fallen together—Cæsarian.	Illustrates how cervix falls together if the head does not descend.
8	H	22	IV	3 N. Ls.	9	9½	6½	3½	3½	Ricketty Flat.	Trial and Lower Segment Cæsarian (over 24 hours after rupture of membranes)	L	L	Admitted in labour. Head not fixed R. O. P. membranes ruptured—os 4 fingers. Morphia—Buist's pad. 17 hours later same dilatation. 24 hours later—same dilatation head floating—posterior parietal presentation—caput formation. Lower Segment Cæsarian.	Occiput was posterior and to the less roomy side.
9	M	22	II	I N. L.	9	9½	6½	3½	3½	Flat.	Trial and Lower Segment Cæsarian (37 hours after rupture of membranes)	L	L	Admitted in labour. Breech—Vertex. membranes ruptured 12 hours later—20 hours later—head still unfixed—os 2 fingers. 17 hours later—meconium—stained liquor. Pains strong retraction ring to umbilicus—os 2 fingers—much moulding. Lower Segment Cæsarian.	Delay in treatment was due to very stubborn relatives. Note rising retraction ring without further dilatation of cervix.
10	M	32	I	Ricketty changes.	8½	10	6	3½	3	Ricketty Flat.	Trial & Craniotomy.	L	S. B. 4 lbs.	Small baby—F. T. head in brim—no overlapping bag glove-like. Slow dilatation—24 hours later bag rounded below—os 4 dilated head partly in cavity. 10 hours later. Pt. tired. bag ruptured artificially meconium stained liquor head—tightly jammed in brim—intended—Forceps in Walchers—failed. F. H. stopped.	The glove-like bag should have been taken as an early warning and the idea of full trial abandoned Cæsarian section would have been the right treatment.
11	M	25	II	1st F. T. N. L. died in few hours.	8½	9	6½	3½	3	Generally contracted Flat.	Trial & Craniotomy.	L	S. B. 6½ lbs.	Admitted in labour. R. O. P. fixed—not well flexed—os fully dilated—bag rounded—Buist's pad. 3 hours later same level indentation noticed—membranes ruptured artificially—head fixed Ant. Parietal lower. No progress 2 hours. Forceps in Walchers failed. F. H. stopped.	Marked disproportion though head fixed.
12	M	22	II	1st Prem. S. B. Eclampsia.	8	8½	6½	3½	2½	Generally contracted.	Trial & Forceps (High)	L	D.	Admitted late in labour. os almost fully dilated—membranes leaking—head not fixed L. O. A. Retraction ring in 3 hours. No progress—Forceps—in Walchers child asphyxiated—indentation.	Had been advised induction of premature labour.
13	M	20	II	1st N. L.	8	9	6½	4	2½	Generally contracted (narrowing at level of Ischial spines)	Trial & High Forceps.	L	L 6 lbs.	Primary uterine inertia—Premature rupture of membranes—allowed nearly 6 hours after full dilatation—marked moulding—child asphyxiated badly but recovered.	A very borderline case.

DIFFERENCES IN LOCATION OF DIFFERENT PARTS OF THE FOETUS AS NOTICED DURING THE LATTER PART OF PREGNANCY AND IN LABOUR.*

BY

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MY object in selecting such a common subject is that since the time I have begun to teach students at the Wadia Antenatal Clinic the practical diagnosis of presentations and positions towards the end of pregnancy, I have noticed certain conditions which varied from the traditional descriptions given in books on Obstetrics, the precise recognition of which was indispensable in arriving at a correct diagnosis. The first point that struck me was at this period of pregnancy, the head was never noticed to engage in any oblique diameter as mentioned in books: the occiput was found to lie either a little in front of or behind the transverse diameter of the brim; when in front, it is one of the anterior positions and when behind, one of the posterior. Such an engagement of the head nearly in the transverse diameter can be explained by three facts: First there is more room in the transverse direction at the brim and in the upper part of the pelvis; secondly even though the uterus is rotated on its axis it does not so much affect the relation of the side to side diameter of the uterus with the transverse diameter of the brim; thirdly the lengths of the oblique diameters are affected by the filling up of the retrouterine pouch with coils of intestines and the sigmoid. Of these the first factor is the most important and as the bony pelvis is concerned in it, it is invariable. As to the second, some explanation is needed. During pregnancy some rotation of the uterus from left to right and slight bending of the fundus do occur; but those changes affect more the upper part of the uterus than the lower owing to the growth in pregnancy of the thick and dense cellular tissues at the sides of the lower part of the uterus. Thus there is but slight alteration in relation of the sides of the lower part of the uterus to those of the pelvis, the transverse diameter of the pelvis being but to a slight extent crossed by the side to side diameter of uterus. This can be proved by the location of the round ligaments; they hypertrophy during pregnancy, which facilitates their recognition; they, on being traced from the fundus down to the lower part during contractions occurring in labour, when they can be more distinctly made out,

* Extracts of the paper read before, 'The All India Medical Conference, Poona 1931.

appear to be at the sides, the only difference being the left is little in front of its fellow. The child adapts itself comfortably to the uterine cavity when the anteroposterior diameter of the head and the trunk corresponds with the side to side space of the uterus (*vide* Fig. 1 and 2). Owing to such adaptation the head naturally engages in the pelvis almost transversely.

In pregnancy as the gravid uterus enlarges and fills up the abdominal cavity, the intestines are in consequence pressed upon; and they therefore descend into the pelvis and occupy the most available space in the retrouterine pouch, thus affecting the space at the posterior extremities of the oblique diameters. The head is not infrequently found descended in the pelvis in primiparae and even in multiparae, though not so commonly as in primiparae. The factors which influence this are the size of the pelvis and the abdominal cavity and the tone of the uterine and abdominal wall. It is this absence of tone which is the main cause of the floating of the head in those multiparae who have had successive pregnancies at short intervals. It is therefore advisable to measure the pelvis carefully when the head does not engage in the pelvis at the proper time in the first three or four pregnancies. It follows from this that the precaution of measuring the pelvis should not be restricted to the first pregnancy alone.

The groove between the head and the trunk at the situation of the neck can be distinctly recognised and helps to distinguish the anterior positions from the posterior, it being oblique in the former and transverse in the latter.

After leaving the groove, examining fingers come upon the anterior shoulder, a structure very important in indicating precisely the position. It can be distinguished by its well-marked conical shape. It has to be differentiated from a hand, which sometimes lies, along with the other hand in front of the face. The hand is flat, less projecting, and by careful palpation extended fingers can be occasionally recognised.

According to the conventional descriptions, when the head occupies one oblique diameter, shoulders engage in the opposite oblique. So in the first position the occiput should be at the left iliopectineal eminence; but on careful examination, the anterior shoulder, the right one in the first position, is to the left of the middle line. By noting the situation of the anterior shoulder in various positions, I have from practical point of view conveniently divided the lower abdomen into four regions by taking central line and a line along the lateral border of each rectus muscle as landmarks; the space between the central line and the right para-rectal lines, the right median and the one between the central line and the left para-rectal line the left median while regions lateral to para-

rectal lines as the right and left lateral regions. The anterior shoulder is in the median regions in the anterior positions, being in the left median region in the first position and in right median region in the second; whereas in the posterior positions, the anterior shoulder is located in the lateral regions, lying in the right lateral in the third and left lateral in the fourth. Such disposition of the shoulder is invariably found in all cases. In accordance with the usual description of the head engaging in one oblique diameter and the shoulder in the opposite, the anterior shoulder would be expected in the right-median in the first position, yet practically it is always detected in the left median. This implies revision in our old belief. I am glad to see that in two of the recent books some mention is made of this fact but sufficient stress is not laid on it; neither reference nor change in description is made while describing mechanism of delivery in vertex presentation.

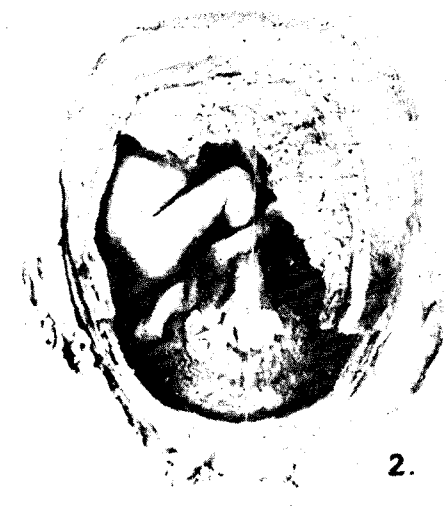
Another point that can be noticed in connection with the anterior shoulder is when the head is floating, quite free above the pelvic brim, the former is away from the central line, being on an average about 10 c.m. from it and about 12 c.m. above the symphysis pubis. (Vide Fig. 3 a, b, c, & d.) This distance of the anterior shoulder diminishes by 2 c.m. both laterally and vertically as the head partially enters the pelvis in course of time, and still further in the same proportion more when the head is engaged and thus gets fixed; the distance from the middle line and that above the symphysis being 8 & 10 c.m. respectively when the head is engaging, and 6 & 8 c.m. respectively when fixed. It follows that disposition of the back and the limbs is worth noticing. In anterior positions the back is felt to the side and in the posterior positions the back is felt quite behind, allowing only a little part of the back being felt in the extreme side of the flank. The result is in the first position the greater part of the limbs is felt on the right side, while a little part is also felt to the left of the central line in the left median region. In a posterior position, the limbs are felt almost all over in front; only a small portion of the back is recognised laterally in the flank. In the first and second positions, the back is felt to the left or to the right respectively; whereas the gap between the elbows and knees can be distinguished on the right side in the first and the left side in the second. In the posterior positions the gap can be easily made out in the middle line.

At the funds the breech or the head can be recognised by their distinctive characters.

While listening to the heart sounds, the variations which are easily noticeable are when the head is engaged, the foetal heart is heard at the usual site mentioned in books but when it is floating the



1.



2.

"A window in the anterior surface."
Anterior shoulder in the left median region. A loop of the cord is seen encircling the neck

"A window in the posterior surface."
Posterior shoulder is in the left lateral region.



3.A

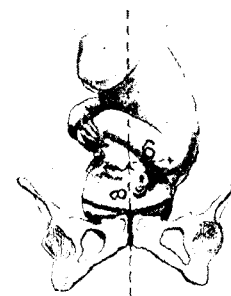


3.B



"Head floating."

"Head just entering."



3.C



3.D



"Head engaging."

"Head engaged."

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heart beats are heard best higher up, the site approaching the umbilicus.

In labour at its onset the anterior shoulder is yet on one side of the middle line: but as the process advances and the internal rotation begins on reaching the pelvic floor, the shoulder approaches the central line. When the rotation is completing, it crosses the middle line and occupies the opposite median region. In posterior positions, the anterior shoulder can be noticed in a later state, when the occiput has reached the pelvic floor, to move from the lateral region to the medial one thus indicating that the posterior position is converted into anterior one. Failing this, the anterior shoulder is felt passing a little behind: it points to backward rotation into the occiput sacral hollow.

Not only is the determination of various positions very important from academical point of view but also from the standpoint of treatment. The management of labour in occipito-posterior position varies from that of anterior position. In the former the patient must take to bed from the onset of labour, in default of which the bag of waters might burst prematurely; whereas in anterior positions the mother is encouraged to walk about in the first stage which favours the process of labour. Thus it must be recognised that in all cases of vertex presentations one line of management cannot be indiscriminately adopted because of the divergence of its influence on labour; what step favours the process of labour in anterior positions prejudices it in the posterior one. Besides in posterior positions the mother has to lie in bed in a particular position, especially on her side opposite to that where the back of the child is located, to promote flexion of its head and to wrap her abdomen with an abdominal binder in accordance with the recommendation of Bruist. In anterior positions the patient is enjoined to lie on her back to facilitate the process of labour all the more. Again if the labour is protracted and the forceps is called for, it can be safely applied under favourable conditions in anterior positions whereas in posterior positions its use is unsafe, nay, dangerous both to the mother and child, until the occiput is first manually rotated forward. The above has been mentioned with a view to showing the significance of determining the various positions; as the correct recognition of these determines the line of treatment. In doing that, the anterior shoulder, being easily distinguishable, may materially help the examiner, provided he remembers that in left positions it is felt on the left side and vice versa. However complete reliance must not be laid on this point only; but other points, some of which have been mentioned, must be regarded as equally important and due attention must be paid to them in deciding the position. These points are:—feeling the

will be the problem for the beginner. Again, with a large scalp tumour, the head may appear to be low down in the pelvis and may even be visible at the outlet, though as a matter of fact, its greatest diameter has not yet passed the brim. Therefore, before introducing the forceps blades, it should be made a rule in every case to examine the case both externally and internally, *under anaesthesia*. In making a vaginal examination, it is better to use the half hand rather than the usual two fingers and feel an ear of the foetus and hence find out the position of the occiput by noting in which direction its convexity lies.

Catheterisation of the bladder, which should always be done before a forceps operation, is sometimes difficult when the head or a large scalp tumour has been low in the pelvis for some hours. The male metal catheter should be used in such cases and in inserting it, the head should be pushed well back by one hand.

The introduction of the blades may be a little difficult in primiparae, where the parts are tense, but the half hand by the side of the head should be able to guide it to within the fully dilated, if not retracted, os.

Almost the first real difficulty met with is in locking the blades. The commonest cause of this is failure to place the blades correctly and to bring them into perfect opposition. This is corrected by carrying the handles of the blades well back towards the perineum as far as they will go, and rotating both of them simultaneously with each hand in the proper direction. Another and more important cause of non-locking is imperfect rotation of the head, whether it is presenting occipito-posterior or anterior. It should be remembered that the forceps are meant to grip the head by its sides, that is, in the bi-parietal diameter, but when internal rotation is not complete, that is, when the sagittal suture is not lying in the antero-posterior diameter of the pelvis, the blades are placed either to the front and back of the head, that is, in the frontal occipital diameter, or obliquely with one blade over one frontal bone and the other over the opposite mastoid region, and hence enclose a larger diameter than they are intended to. In these cases, the handles, though in perfect opposition to each other, cannot be made to come together. The remedy is to remove the blades and rotate the head by inserting the whole hand into the vagina and gripping it by the fore-fingers on the one side, with the thumb on the other. In occipito-posterior cases, the body should also be rotated at the same time, with the other hand on the abdomen, or by an Assistant. If this is unsuccessful, the cephalic method of application should be followed, and each blade inserted so as to lie in relation to the ear, when the forceps will be found to lie obliquely in relation to the pelvis. Another difficulty in locking met with by the beginner in one type of instru-

ment, namely, Milne Murray's Forceps, is due to the traction rods coming to lie between the handles. This is easily corrected by seeing that each traction rod lies to the outer side of the handle on its side, and keeping the rods well back towards the perineum.

Application of forceps to the floating head is a terror even to the experienced obstetrician, on account of the difficulty that is experienced not only in locking, but also in the further stages of the operation. This should be avoided by the beginner. The application of the instrument to a head high in the pelvis, is also extremely difficult on account of the difficulty of negotiating the curve of Carras in spite of the several mechanical devices invented for applying traction "in the proper axis."

The next really serious difficulty arises when the head fails to come down on traction. This may be due to one of several causes.

1. In cases where retraction of the cervix has not taken place completely, one blade or other may have been placed outside the cervix, so that the forceps grip not only the frontal head, but also the cervix. This is due to lack of observing the precaution of inserting the half hand to guide the blades within the dilated cervical canal. The error is discovered by passing the finger tips along the outer surfaces of the blades high up and feeling for the cervix, and if this unsuccessful, it is better to remove both blades and re-apply them correctly.

2. The head may fail to come down if the cervix is imperfectly dilated and is, in addition, thick and undilatable. This cause is said to have operated in no less than 151 cases out of 558 studied by Douglas Miller. These are cases in which the instrument should not have been used at all, or used prematurely in order to hasten delivery to save the practitioner's time, or with a view to satisfy the importunities of the suffering patient or anxious relatives. In such cases, the practitioner finds himself in an awkward predicament, when he has to explain to them the cause of non-delivery. The treatment is to take courage in both hands and remove the instrument and wait.

3. Another cause of failure of the head to descend is persistent occipito-posterior position. This is by far, the commonest of the difficulties met with, and occurs in well over 50 percent of the cases. In these cases, the occiput fails to rotate, especially when the head is not sufficiently flexed. Thus when the forceps grip the head antero-posteriorly, that is, one blade over the face and the other over the occiput, every pull helps to decrease the amount of flexion, and a larger diameter has to be negotiated, that is, instead of the suboccipito-bregmatic diameter, a diameter whose anterior end is farther and farther forward from the anterior fontanelle. This of course is impossible, unless the head is very small. The treatment is to remove the instrument, rotate the

head manually by internal and external manipulations till the occiput comes behind the symphysis, and then to re-apply the forceps. When this is not successful, sometimes one has to deliver the head with the occiput posterior and the face towards the pubis. Traction then must be directed much more forwards, even before the head can be "crowned". A slight rotation will make the sagittal suture antero-posterior and facilitate traction and delivery. There is, of course, a greater danger of laceration of the perineum which must be prevented by a properly directed episiotomy.

4. Disproportion between the head and the pelvic brim is another cause of failure. Disproportion may be due to a contracted pelvis and a normal sized head, or a normal pelvis with a large head, as in a big foetus, a post-mature foetus, or a hydrocephalic one. These are again mostly cases in which forceps application was not properly indicated. If the disproportion is of a slight degree, a little stronger traction will succeed to bring down the head, though with some risk to the foetus. In the flat variety of contraction, traction in the Walcher's position would help to bring down the head into the pelvic cavity, and once this occurs, there is no further difficulty. Internal podalic version and extraction is the alternative method, and may succeed. If the pelvis is of the generally contracted type, the difficulty will only increase as the head comes further and further down. Hence in this and the other conditions mentioned some other form of delivery should be adopted.

5. In some cases when the head has been engaged in the pelvis already, or when it has encouragingly come down to a certain extent by traction, further progress is hampered by contraction of the pelvic outlet. This type of case is much less common than the flat and small round pelvis. The chances of delivery will depend upon the length of the posterior sagittal diameter, that is, the distance between the mid point of the transverse diameter of the outlet, and the tip of the last piece of the sacrum. When delivery can take place, extensive tear of the perineum occurs. If there is no progress, the treatment is to do a pubiotomy or symphysiotomy.

6. Anterior fontanelle presentations, brow presentations and impacted mento-posterior presentations form another group in which delivery by forceps becomes difficult or impossible, and alternative methods such as version or craniotomy have to be employed.

7. A rarer cause of failure of the head to come down on traction is obstruction caused by tumours such as cervical fibroid, or ovarian cyst, or bony or other tumours of the pelvis. Such obstruction should be prevented from occurring, as it is easy to diagnose them before delivery is attempted by forceps.

8. Locked twins and double monsters of various kinds form another rare group. These are got over by destructive operations.

9. Still another rare cause is what is known as a "contraction ring." In this condition, the circular muscular fibres apparently of the lower portion of the upper segment of the uterus are found to be tonically contracted in the form of a ring which projects into the uterine cavity and grips the foetus so tightly that no amount of traction on the head can get the foetus to pass it. It does not relax even under deep surgical anaesthesia. It can only be suspected when traction proves unsuccessful and is diagnosed by passing the hand into the uterus by the side of the head. The only treatment is to deliver by Caesarean section, whether the foetus is alive or not.

After the head has been delivered, difficulty is sometimes experienced in delivering the trunk of the child. This may be due to a tight cord round the neck, may be several times, or it may be due to unduly broad shoulders. Much less commonly it is also caused by tumours of the thorax or abdomen (hydro-thorax or hydro-peritoneum), a distended foetal bladder, or some types of monsters. A tight cord is easily dealt with by cutting it across between two pairs of clip forceps. For the impacted shoulder, careful traction of the head is made without unduly tilting it to one side or other. If this fails, Cleiotomy on the live child is recommended by some authorities. For the rare conditions mentioned above, embryotomy is the only treatment.

We will now consider the dangers and risks attached to the operation. These consist in injuries to the mother and child and the complications resulting therefrom. They may be severe enough to cause the death of the mother or the child, either immediately or later. When less serious, they may lead to more or less permanent impairment of general health.

Maternal injuries.—Laceration of the perineum is the commonest of these, and is sometimes unavoidable on account of the smaller time available for the dilatation of the soft parts of the outlet, the condition of the foetus not permitting a slower extraction. But careful traction in the proper axis, allowing as much time as possible for the head to dilate the vulva, taking care to prevent too early extension of the head, that is before "crowning" takes place, withholding traction at this stage and allowing the head to be "breathed out" by the mother, care and steadiness in removing the blades of the forceps—all these go a great way in minimising the extent of the injury. The levator ani and the perineal body may be injured but the sphincter of the anus should be preserved in every case. In these cases, a better treatment would be to do an episiotomy. Here we get a clean cut wound, in preference to a laceration whose extent and direction cannot be controlled. The episiotomy wound prevents injury to important structures and heals up much better.

Laceration of the labia and the vestibule and its bulb often occur and are caused by direct pressure of the edges of the blades. These are sometimes inevitable and should be repaired in every case. The urethra may be injured during catheterisation, or by extension of a laceration of the vestibule. The clitoris was injured in one case by the scissors while cutting across a cord which was tightly round the neck of the foetus. The bleeding is profuse in such cases and should be stopped by passing deep catgut stitches.

Lacerations of the vagina are caused by a direct extension of the perineal laceration and are sometimes double—one on either side of the rectum. There is the accompanying tear of the levator ani and its investing layer of pelvic fascia. Vaginal lacerations may also be caused directly by pressure of the edges of the blades when the instrument slips, or during artificial rotation of the occiput to the front. These injuries may be of varying depth and may open into the bladder or rectum, leading to traumatic urinary or faecal fistulae. Submucous injuries may also result in such cases leading to the formation of haematoma of the vagina. The laceration should be stitched up with catgut immediately, if necessary in layers. Haematoma, if large enough, should be incised into, the clots turned out, bleeding points secured, and the wound stitched up again.

Lacerations of the cervix are caused when delivery is attempted through an imperfectly dilated os, and may extend into the vaginal fornices, opening up the parametric cellular tissues or injuring the ureter or bladder with formation of urinary fistula, or into the lower uterine segment causing partial rupture of the uterus. Including the tip of an imperfectly retracted cervix within the grip of the blade has been known to tear it off partially or completely. These injuries are always more or less serious and should be sewn up carefully. Rupture of the uterus may also be caused by careless use of the instrument in cases of tonic contraction or "contraction ring." These cases demand immediate opening of the abdomen, to deal with the injury satisfactorily. Other rarer forms of injury are separation of the symphysis pubis or sacro-iliac joints due to forcible traction of the head through a contracted pelvis. Damage to the fourth and fifth lumbar nerves, in their passage across the pelvic brim to form the lumbosacral cord, has been recorded and shows itself by paralysis of the muscles supplied by the external popliteal nerve.

The immediate results of these injuries to the genital tract *viz.*, shock, hæmorrhage, septic infection leading to acute ill-health during the puerperium, are well known. But the later sequelae are even more important. It may be stated without fear of contradiction that for every woman that dies, or is acutely ill after child-birth, there are at least ten who are permanently damaged, or suffer from various indefinite, yet distressing symptoms. A damaged perineum

and pelvic floor leads to downward displacements of the uterus, with its accompanying "exertion" back ache, urinary troubles, leucorrhoea constipation, and chronic ill-health. Incontinence of the bowel, especially when loose, is another disgusting sequel. Chronic infection of the cervix, pelvic cellular tissue and the uterus and adnexa, lead to other displacements of the uterus, chronic pelvic pain, dysmenorrhoea, menorrhagia, dyspareunia and sterility from blocking of the fallopian tubes. Debility, anaemia, gastric and intestinal dyspepsia and nervous disorders are some of the lesser known, but nonetheless important after results.

Fœtal injuries. The injury to the foetus is naturally more severe in its consequence. The immediate and neo-natal mortality is high, varying from 5 to 20 percent, but there are several more injuries of a minor character and others again which may lead to permanent disability in the form of paralysis, interference with the physical growth and mental development of the child. Facial paralysis is one of the commonest and is caused by pressure of a blade of the forceps over the region of the stylo mastoid foramen. This occurs when rotation has not taken place completely and the sagittal suture is still in the oblique diameter of the pelvis. The paralysis may be central in origin and sometimes occurs independent of instrumental delivery. The former is not generally severe and is due to bruising of the nerve sheath, but if the nerve is severed, it takes longer to recover from. The central type has a more serious prognosis. Abrasions of the skin of the face, of the scalp, and contusions of the adjacent parts may result especially when rotation of the head has been done by forceps and if the instrument has slipped. They are not generally serious. Cephal-hæmatoma, or accumulation of blood under the peri-cranium, is similarly produced and is absorbed in favourable cases in the course of a few weeks. I am inclined to think that hæmorrhagic disease is a factor in its causation, as the condition is sometimes met with even after natural labour. It may require aspiration, if persistent, and incision and turning out of the clot, if suppuration takes place. Depressed fractures of the frontal or parietal bones may occur from undue pressure of the blades in contracted pelvis and in most cases correct themselves in time. Interference is only necessary when definite pressure symptoms show themselves, but some authorities recommend correction in every case, either by pressure on the head exerted in a diameter opposite to the one in which the injury is, or by cutting down on the part and levering out the fractured bone. More severe pressure on the fetal skull may cause rupture of meningeal vessels with cortical hæmorrhage which may cause death or more or less extensive paralysis. The pressure of the blade over the orbital margin and the eye, may cause contusion and laceration of the lids, subconjunctival ecchymosis,

abrasion or rupture of the cornea, or of the lens capsule and consequent cataract, fracture of the orbit, exophthalmos, and rupture of the eye-ball. The milder of these injuries are sometimes unavoidable but the severer ones should be prevented. The umbilical cord when round the neck, may be cut by the tip of the forceps blade and may lead to the death of the foetus from bleeding, if delivery is not hurried through. It has in one case in the records of the Government Hospital for Women and Children, Madras, been known to snap when slipped over the head. Sterno-mastoid haematoma leading to what is called Congenital Torticollis, is supposed to be due to contusion of the muscle from pressure of the forceps blades, but it is much more likely that other causes are responsible for this.

Brachial paralysis of the Erb-Deuchenne type, is due to undue tension on the roots of the fifth and sixth cervical nerves and may be caused by long rotation with the forceps or undue traction of the head during delivery, or an impacted shoulder. The injury may range from mere stretching, bruising or tearing of the nerve sheath, to actual severance, partial or complete, of the root. The former type is recovered from in the course of a few weeks, but the latter leads to more or less permanent paralysis.

My thanks are due to the Superintendent Government Hospital for Women and Children Madras for permission to utilise the records of the Hospital.

YET UNCERTAINTY ABOUT THE TREATMENT OF PLACENTA PRAEVIA.

By

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Is there any need of an article on the treatment of Placenta Prævia?

Such a question would naturally be raised by readers, in view of the subject being very common, more meant for college students, and not for the more enlightened class of readers for whom the magazine is intended. The writer apprehends they might cursorily look at the heading, and not even offering scant courtesy of running their eyes over a few lines, will turn to other articles more fascinating and more novel. Yet he ventures to write it on the ground that when one reads even the recent editions of Midwifery of recognised authors, one does not fail to notice the striking diversity in the lines of treatment advocated. The confusion is worse confounded by articles in

current magazines, each writer attempting to establish a treatment without discrimination and supplying statistics in support of it. Under the circumstances the class of general practitioners who practise in the mofussil, who have to deal promptly with cases on the spot owing to their seriousness find themselves in a fix in determining the treatment to be adopted. The writer therefore first takes a general survey of the treatment and makes a few suggestions in the end.

For the efficient management of a case of Placenta Prævia, certain factors have to be thoroughly recognised and borne in mind. They can be summarised as follows: it always recurs; it is inevitable during labour; there is unusual softness and friability of the Lower Segment of the uterus and the cervix in Placenta Prævia; the patient is specially liable to infection partly owing to the lower situation of Placental site and partly to antepartum haemorrhage which lowers the power of resistance.

Treatment before Labour.—In as much as haemorrhage recurs in Placenta Prævia, temporising procedure is nowadays universally condemned. Until recent years it was advised to admit such a patient to a well managed Hospital, to place her under a careful nurse, to enforce absolute rest in bed, to administer her Calcium and Iron, thus enabling her to turn the corner, and to induce premature labour, when the child if born, stands a fair chance of surviving. This practice has been justly given up. Now as the diagnosis is established, to avoid further haemorrhage which may endanger her life, the pregnancy may be terminated. Many a time with bleeding the cervix is dilated and it readily admits two or one finger rendering subsequent manipulations easy. If not open and the bleeding has stopped, one may wait until the next bleeding occurs, when it may dilate and allow the necessary steps to be taken. If practicable, she may be sent to a well-equipped institution for the suitable operative measure. Here it may be mentioned that if the patient has bled considerably, she is a late Primigravida, the pregnancy has approached nearly term so that the child possesses fair chance of life after birth. Caesarian Section is the remedy of choice, especially when the cervix is closed and feels rigid. But under converse conditions, viz. when the patient is a young primipara, has had slight hæmorrhage in the seventh month of pregnancy, Caesarian Section can by no means be regarded as a remedy.

When the Cervix admits two fingers.—There are two alternatives: (1) pulling down the leg, (2) introducing De Ribe's bag. The former has certain advantages over the latter: it can be employed at any time and in any place under aseptic precautions of nowadays, no special apparatus being needed; it can be practised for all varieties of Placenta Prævia: it is effectual in controlling

hæmorrhage until the delivery of the child is effected; the medical attendant need not constantly be on the case, entrusting the case to a reliable midwife in the meanwhile. The main objection to this method of treatment is a heavy foetal mortality. The method of employing De Ribe's bag compares unfavourably with the other; it requires a special apparatus thus entailing the removal of the patient to a Hospital; it cannot be applied for all varieties; being dangerous for central and too much for lateral, which cannot infrequently be treated by mere rupture of the membranes: the medical attendant cannot leave the patient; for after the expulsion of the bag, unless the effective uterine pains have set in, considerable hæmorrhage may follow in his absence when prompt measures are not taken to check further hæmorrhage.

In fine it may be said that pulling down the leg will invariably be an operation of choice for practitioners in all varieties of Placenta Prævia, the other being reserved for well equipped institutions.

To avoid internal manipulations, which are so risky owing to special friability of cervix in Placenta Prævia, before proceeding to pulling down the leg, external version should be performed and the breech brought down. When Placenta is occupying the lower part of the uterus, the presenting part is high up and can be readily pushed towards the fundus, while the breech drawn down over the brim. If the os admits two fingers, they may be passed through the cervix, the position of the foot ascertained, the membranes ruptured, the foot seized and drawn down. The half breech compresses the Placenta and controls bleeding. Should bleeding appear, it can instantly be checked by traction on the leg. To have continuous pressure, a weight of about two pounds may be applied to the leg by means of a gauze tied to it and hung over the foot of the cot. Generally labour starts within a few hours and delivery is effected by natural forces. During child-birth, as the pressure is exerted on the Placenta by successive parts of the foetus until it is wholly born, the bleeding is effectually controlled.

If cervix admits one finger:—Such a condition precludes from adopting first the customary measure of pulling down the leg. Under the circumstances other measures are indicated.

(1) To use Willett's forceps.

(2) To rupture the membranes and plug the vagina or

(3) To perform version and to rupture the membranes and allow the liquor amnii to drain away so as to cause the buttocks to come close to the Placenta and compress it.

(1) *Willett's Forceps:*—It can be used in marginal or lateral Placenta. It is applied to the scalp and so if the child is presenting by any other presentation than the vertex, it should be changed into the latter. After rupturing the membranes, the head is steadied on

the brim, the forceps with the closed blades is introduced and first kept pressed on the head and then opened sufficiently to allow a fold of the scalp to get between the blades, which are now closed. A weight of two lbs. is tied to the rings by means of a piece of a gauze which is slung over the foot bar of the cot. The hæmorrhage is generally controlled and labour if not set in will begin in a few hours. This measure entails less uterine manipulation and in consequence causes less bleeding and can be safely adopted even when the os is admitting one finger. The injury caused to the head is found to be negligible.

(2) *To rupture the membranes and to plug the vagina:*—This treatment is followed in the Queen Charlotte's Hospital. After the membranes are ruptured and the liquor amnii is allowed to flow away by lifting the presenting part, the vagina is plugged tightly and firm abdominal binder applied, the Placenta site being thereby compressed between the presenting part and the vaginal plug. Such plugging when properly carried out by tightly packing the fornices all round the cervix and by filling the vagina from above down, is effective in checking bleeding. But there is one danger associated with it, a danger of infecting the Placental site which is so near the os. It is real danger, proved by statistics of hospitals, whenever plugging was resorted to. Recognising this, one must observe thorough asepsis. Not only should the gauze be sterile but impregnated with an antiseptic, such as Flavin (one in thousand). It should not be left in longer than 24 hours. It is advocated by Aleck Bourne for all varieties of Placenta Prævia and he does not advise the turning of the child since he believes that when the head is down, the Placenta is more effectively compressed between it and the vaginal plug. Yet when the Placenta is central, the preliminary external version is advisable, because at the time of the removal of the plug—it should be conveniently removed after 8 hours in central variety to avoid sepsis and to note the dilatation of the os—the os may be found dilated to the extent of two fingers, the latter then can be readily introduced through the hole in the Placenta, the foot secured and pulled through. The half breech will then effectively command the hæmorrhage.

The procedure of vaginal plugging combined with rupture of the membranes is specially advisable when a patient is in shock from considerable loss of blood; manipulations required to carry it out are less; and in consequence they will not aggravate the shock. This treatment is therefore of great service in tiding the patient over the critical condition while time will be available to combat the existing shock.

(3) *External Version with rupture of the membranes:*—This treatment is useful when the hæmorrhage is moderate and the os

admits one finger. The external version is first performed, the bag ruptured, the liquor amnii allowed to drain away by lifting the breech by both hands from above the symphysis pubis and lastly a firm abdominal binder applied. The bleeding is somewhat controlled and labour starts in a few hours. As soon as the os admits two fingers the foot may be seized and brought down. In point of controlling bleeding, it is inferior to vaginal plugging but the great danger of the subsequent puerperal sepsis is averted and secondly the external version having been made first, pulling down the leg afterwards is facilitated whereby the bleeding is effectively commanded.

During Labour:—If bleeding occurs for the first time in labour the case is most probably of lateral Placenta Prævia. If the bleeding is slight, the only thing that can be done is to rupture the bag and to tie an abdominal binder, when it is invariably controlled. If the hæmorrhage is much, the head is free above the brim and the bag intact, external version should be first performed under anæsthesia, the latter being necessary as the uterus is contracting. When the breech is drawn over the pelvic brim, two fingers may be introduced through the os, which must have been dilated, in that the labour has already begun, and the foot may be seized and drawn down. These procedures are found to be enough when labour has supervened and the uterus is contracting with effective pains.

From the above it may be concluded that the conduct of a case of Placenta Prævia may be directed according as the Placenta is central, marginal or lateral and the mother is or is not in labour and also according to her condition induced by the amount of blood lost. Yet some do indiscriminately advocate one or the other method, condemning the rest. Thus it is not unusual to find the advocates of Braxton Hicks method, of vaginal plugging and now of Caesarian Section under all circumstances. This can be readily realised from the following extracts taken from various sources and given in the *Journal of Obstetrics and Gynaecology of the British Empire*:—

C. Pukham of John's Hopkins Hospital writes in his statistical study of Placenta Prævia of that Hospital that the Hydrostatic bag may be regarded as the best method although it is far from the ideal method of treatment. He deplores the indiscriminate use of Caesarian Section. He mentions that in 146 cases of Placenta Prævia of that Hospital, Braxton Hick's version was employed only three times.

A. Bill (*The American Journal of Obstetrics and Gynaecology*, February 1931).—The author thinks that we should be radical in the treatment of Placenta Prævia and perform a Caesarian Section whether the child is alive or dead, unless the os is considerably dilated. In this event he advises rupture of the membranes or version.

M. P. Rucker (*Journal of the American Medical Association*, April 1931).—The author bases his conclusions on an investigation of 141 cases of Placenta Prævia. He maintains that a vaginal examination should not be made until everything is in readiness for the treatment of Placenta Prævia. He makes the statement that vaginal plugging even as a temporary measure during the transport of the patient to hospital, does more harm than good, and in its place he advocates the administration of morphine alone. He believes that in the interest of the child Caesarian Section has a place in the treatment of both complete and partial Placenta Prævia.

Magos (Brussels—*Medical*, May 1931).—He advocates rupture of the membranes in lateral Placenta Prævia when the labour is in progress. In the case of marginal or central Placenta Prævia steps should be at once taken to empty the uterus. He does not advise the use of podalic version or De Ribe's bag for the high foetal mortality. He strongly advocates the performance of low Caesarian Section.

R. Kessler (*Montasschiff Für Geburtshilfe und Gynaekologie*, October 1931).—In his 107 cases of Placenta Prævia rupture of the membranes was done 10 times, Braxton Hick's version in 20 cases, metreuryesis in 5, anterior hysterectomy 21 times, Caesarian Section in 35 cases while spontaneous delivery in 16. There were no maternal deaths among the cases treated by Caesarean Section. This operation is advised for all cases of central Placenta Prævia with a closed cervix and in cases of marginal and partial Placenta Prævia in which loss of blood has been marked. Version is advised as the best method for general practitioners to employ when called upon to treat cases of Placenta Prævia. He advises to send every case of Placenta Prævia to Hospital without vaginal examination.

Prof. Essen Møller (*Acta Obstetrica Scandinavia*, Vol. XI, Fasc. 1 and 2, 1931).—The author reviews the established methods of treatment of Placenta Prævia, version, rupture of the membranes, hydrostatic bags and plugging the vagina and compares them with the treatment by Caesarean Section. He states that as matters stand at present, the rupture of the membranes is indicated in lateral and marginal cases in which hæmorrhage is not severe and that the time has come to dethrone version from the domineering place it has long occupied and to limit its use to cases in private practice where other means are not within reach, or when surgical interference is contraindicated. He condemns strongly vaginal plugging. Caesarean Section he says, has an important place in the treatment of Placenta Prævia giving results decidedly superior to the older methods.

He then proceeds to discuss those points which are in favour of vaginal Cæsarean Section but at the same time admits that decidedly it is a more difficult operation and does not give results better than abdominal Cæsarean Section.

Ganssle is the great advocate of Cæsarean Section, who states that it is the ideal treatment provided the child be living and viable and there are no manifest signs of infection at the time of the operation. In his hands, from the clinic at Tabinjen, the mortalities of Cæsarean Section and vaginal interference of the mother are 6.4 % and 8.7 % respectively. Conrad gives the results obtained at the Virchow Hospital from 1906-1924 from Cæsarean Section by Lower cervical Incision (Lower Segment), Vaginal interference (Version), Metreuryasis (Use of Bags), the mortality being 9.8 %, 7.5 % and 11.6 % respectively.

From the above it can be readily understood that the treatment of Placenta Prævia has been differently recommended by different obstetricians and unanimity is yet to be reached. Under the circumstances, the most useful practitioner should have before him a fixed line of action. He will be acting wisely when he sees a patient at the time of first bleeding or soon after it, and distinguishes it as a case of Placenta Prævia, if he directs the patient's relatives to remove her to a well-equipped institution where convenient measures can forthwith be taken to interrupt pregnancy. If the patient is bleeding, Morphine gr. $\frac{1}{4}$ may be injected to keep her quiet and to control hæmorrhage during the transit.

If the patient has severe hæmorrhage and she cannot be sent to a Maternity Hospital because of long distance or of seriousness of her condition, he should undertake the case and should perform External Version to bring the breech over the brim. External Version can in most of the cases be easily carried out as in Placenta Prævia the head lies quite free well above the pelvic brim, and it can be readily pushed towards the fundus. Somebody should be asked to hold the head temporarily at the fundus while rigid aseptic precautions are being taken both regarding the medical-man's hands and the patient's parts. The patient having been placed across the bed in the Lithotomy position, two fingers are introduced in the vagina and the dilatation of the cervix determined. If the latter admits two fingers which is not infrequently the case in severe hæmorrhage, the fingers are withdrawn, the hand is again immersed in Lysol lotion and with the lotion dripping, the whole hand is introduced in the vagina, preferably under anæsthesia, and the two fingers passed in the cervix, and the position of the foot ascertained. If the placenta is found lying across the internal os, the fingers should be unhesitatingly passed through its thickness, the

membranes ruptured by means of a long forceps, the foot seized and drawn down and then the abdominal binder applied. The foot of the bed should be raised to one foot and a half and the foot of the child secured by a gauze, the end of which is fixed to the mattress by safety pins. The further delivery should by no means be hastened under any circumstances and nature should in all cases be allowed to effect it. Because of bleeding or of shock present, measures should not be adopted immediately to terminate labour, inasmuch as such hasty step will invariably aggravate the shock and threaten the life of the patient. This principle should always be borne in mind, otherwise, the treatment of Placenta Prævia by external version followed by pulling down the leg, which is safe for the general practitioner to adopt, is sure to be followed by dangerous results, if he allows himself to be alarmed by the amount of blood lost, by the serious condition of the patient or by the false hope of saving the child, and under this trepidation he proceeds forthwith to extract the child, an act which will surely lead him to the land of greater difficulties. The proper remedy for the shock is not to hasten the delivery but to adopt restorative measures after pulling down a leg. The further hæmorrhage is always controlled by compression produced by the half breech and he need not be concerned on this point. To combat the shock, Saline may be injected, intravenously or intracellulally Morphine gr. $\frac{1}{4}$ given subcutaneously, to keep her quiet and thus conserve her strength, and the body covered with warm blankets, the foot of the bed having been already raised.

External version with pulling down a leg is safe and should be preferred to bipolar version with Braxton Hick's method, as the latter induces more bleeding and exposes the patient to the risk of injury to the cervix and of sepsis. This method of external version is safe and it can be readily proved by the statistics obtained at Nowrosjee Wadia Maternity Hospital, where it is mainly resorted to.

Of the five deaths, one patient died immediately after admission before they could do anything to the patient. Two were in extremes and died within two hours after the foot was pulled down while the other two died some hours after. Excluding the case on whom no treatment could be adopted, there were four deaths in 94 cases the proportion working out as 4.25 %, (excluding cases of Willett's Forceps).

After External Version if it is discovered that the os admits one finger only, the membranes may be ruptured and as much of liquor amnii as possible be allowed to flow away and the abdominal binder applied. Since liquor amnii has run away, the uterus comes closer in contact with the child and presses it down on the Placenta.

PLACENTA PRAEVIA CASES: N. A. PURANDARÉ.

Year.	No. of cases.	Treatment.	Result to mother.		Result to child.		No. of confinements.	Remarks.
			L.	D.	L.	D.		
1928	18	Version.	16	2	1	17	3051	12 children premature.
1929	17	Version.	17	...	7	10	3371	7 children premature.
	1	Forceps.*	1	...	1	...		
1930	26	Version.	26	...	6	20	4110	16 children premature.
	1	Died before any-thing could be done.		1		1		
1931	32	Version.	30	2	6	26	4467	21 children premature.
	4	Willet's Forceps.	4	...	3	1		
	99		94	5	24	75	14999	56

Type of version done was External Podalic followed by pulling down the leg.
 * Forceps was applied when the head had descended on the perineum and was delayed there.

Bleeding is invariably controlled. If not, the vagina is plugged thoroughly, the gauze to be used being well sterilised by boiling and then dipped in 1-2000 acriflavin solution.

If the labour has begun and the pains are strong and recurring at regular intervals and the presenting part engaging, mere rupture of the membranes is enough, provided the lie of the child is verticle. Bleeding is as a rule controlled.

If the presenting part is free above the brim and bleeding is more than moderate, external version is called for and should be carried out under anæsthesia and the foot drawn down. No further treatment is necessary.

The Placenta is generally expelled naturally. Should it not come out, it can be expressed readily inasmuch as greater part of it has been separated. If not, it has to be removed manually to avoid further loss of blood.

If the above line of treatment is carried out by a general practitioner, he can safely deal with cases of Placenta Prævia at patients' houses when they cannot be sent to any hospital.

ECLAMPSIA.

BY

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ECLAMPSIA is one of the toxæmias of pregnancy and it is common where other toxæmias of pregnancy such as accidental hæmorrhage occur frequently. It appears to be a very much more common complication of pregnancy in South India than is accidental hæmorrhage, though this is not uncommon, or than hyperemesis gravidarum, which is decidedly rare.

The statistics of the three largest clinics in South India i.e., the Government Hospital for Women and Children, the Rajah Sir Ramaswami Mudaliar Lying-in Hospital and the Government Victoria Hospital for Women, Madras, show that annual incidence of eclampsia averages 18 per thousand births in hospital. Owing to the confidence of the people in hospital treatment it is very probable that a large proportion of the sufferers with eclampsia receive hospital treatment in Madras. The state of things is very different in North of India, e.g., Lucknow where convulsions during pregnancy

are considered to indicate diabolic possession, and the unfortunate woman is treated with beating, branding and solitary confinement to drive the devil out of her. Eclampsia is most commonly met with in the later months of pregnancy, though I have twice seen it as early as the 5th month. It usually occurs during the ninth month, and generally just before the onset or actually during the process of parturition. The convulsions may, however, be first seen some hours after labour is completed. In such cases very often only one fit occurs, but if the fits are numerous the outlook is apt to be serious.

In the large majority of cases prodromal symptoms, which together constitute the pre-eclamptic state, occur some days before the actual occurrence of a convulsion, and it is very important to recognise this pre-eclamptic state, as with careful and prolonged treatment the catastrophe of eclampsia may be averted. The symptoms of this pre-eclamptic state are:—1. Headache 2. Epigastric pain.—3. Oedema of the foot and abdomen, often also of the face.—4. Urinary trouble, e.g. scanty secretion of urine or albuminuria—but it should be noted that occasionally albuminuria is absent though the urine secretion is scanty.

One of the worst cases of eclampsia which occurred in the Government Victoria Hospital in 1929 was in a woman who had been treated as an in-patient for severe headache, and scanty urine for several days in the ninth month of her third pregnancy. Repeated examination disclosed no albuminuria, and on eliminative treatment the headache disappeared and the urinary secretion increased to normal. As the patient felt all right, she requested that she might be discharged to her home. She was brought back comatose a week later, having had five fits in an hour, the urine was solid on boiling, and labor had begun. The labor progressed normally and she was delivered of a living child, but the convulsions were very numerous, the patient was unconscious for five days, and was completely blind for two or three days after regaining consciousness. Eventually, however, she made a perfect recovery, and left the hospital free from albumin, able to read without any trouble, and nursing her infant. This case shows the importance of careful treatment till the end of pregnancy, even though the patient is apparently well.

The treatment of the pre-eclamptic state should be as drastic as of the developed condition, although it is not always possible to keep the patient content on the restricted diet which is necessary if there is much albumin.

The treatment consists in starvation and elimination. If there is much albumin all food is withheld and the patient is given copious

alkaline drinks of sodium bicarbonate, together with glucose to ward off the onset of hypoglycæmia. Even though there may be considerable oedema of the body it is necessary to give fluid freely in order to flush out the kidneys. The bowels must be very freely moved, and to effect this Mag. Sulph one dram with Mist Sennae Co., one ounce, every three or four hours is found to be most satisfactory, as it assists in withdrawing fluid from the tissues.

To carry out this treatment it is essential that the patient be kept rigidly in bed, in order to decrease the production of waste matters to the lowest possible level. For this reason it is necessary to have a couple of nurses, one for day and the other for night, to attend the patient, and in a bad case she should be moved into hospital as it is extremely difficult to induce the relatives to adhere to the strict diet which is necessary.

Patients will usually tolerate fasting easily for 24 hours and in some cases will continue to fast for 48 hours without too much discomfort. In the pre-eclamptic state it will generally be found that the urine is free from albumin in 48 hours. The diet may then be gradually increased. In pregnancy the body requires large quantities of carbohydrate, but the protein intake may be severely restricted. The diet therefore should consist of bread one lb in the day, and glucose 5% solution 5-6 pints daily. Instead of glucose brown sugar may be mixed with water and flavored with lime juice to make it more palatable. In addition to, or as a substitute for bread, the patient may have soft boiled rice, arrowroot or sago cunji made without milk, boiled potatoes mashed with butter or ghee, and fruits such as oranges or sweet limes—weak coffee may also be added to the diet, it is very much appreciated by the patient, and the amount of milk it contains is so small as to be negligible.

When the patient has been on such a diet for some days, say for a week, and the urine remains free from albumin, milk may be added cautiously—half a pint a day at first, and later if no albumin appears it may be increased to one or one and a half pints. Green vegetables, salads and butter-milk may be added. Dal may be added sparingly. No meat or soup should be allowed. With such a diet the patient can carry on comfortably till the end of pregnancy. But it must always be remembered that she should be carefully watched, and if there is any recrudescence of symptoms she should again be starved and purged.

Labor should be allowed to occur spontaneously. It will often be found that if there has been a severe form of albuminuria, some days, or a week after treatment has been instituted the patient falls into labor and delivers a still-born infant.

The basic treatment of developed eclampsia is the same as of the pre-eclamptic state—i.e., elimination of toxins. It is urgent that this elimination should be promoted rapidly, in order to restore the patient's metabolic equilibrium. This elimination is effected by copious colonic lavage, and purgation. The lower bowel should be cleared out with enema saponis, at least 4 pints are required to effect this, and then Soda. bicarbonate irrigation of the colon is given every 4-6 hours.

If the patient is vomiting, but is sufficiently conscious to swallow, we find that gastric lavage with hot sod. bicarb. solution is very useful: just before the stomach tube is withdrawn 3-ozs of Mist. Mag. Sulph. are introduced into the stomach. If however the patient is unconscious gastric lavage should not be performed, as the large tube may lead to respiratory embarrassment. In such cases it is wiser, and easier to insert a nasal tube and thus introduce any required medicine into the stomach. It is always desirable to give these patients Mag. Sulph. and this may be given through the nasal tube. Fluids must be introduced into the body. Sod. bicarb. may be given by rectum four ounces every two hours, or if there is rectal irritation the fluid may be given by the Nasal tube. If it is considered necessary to give the fluid very quickly it may be given intravenously, not more than 15 ounces should be given at one time as there is danger of pulmonary oedema. Submammary saline injections should not be given in these cases as there is so much danger of sloughing of the breast.

If the fits are numerous and severe it is necessary to give sedatives, Morphia gr. $\frac{1}{2}$ may be injected to start with and gr. 1, 10-12 hours later if necessary. Potassium bromide and Chloral hydrate may be given in the milder cases. We give 20 grains of each as a start, and repeat the bromide fourth hourly, and the chloral thrice daily or fourth hourly as is necessary.

Labor should always be allowed to proceed naturally, it is usually easy and terminates quickly. If however there is delay when the head is low in the pelvis ether should be administered as an anaesthetic and delivery effected by forceps. In these cases chloroform should be avoided owing to its ill effects on the liver which is already damaged. It is highly undesirable to interfere in the earlier stages of labor. Accouchment force has been entirely abandoned as its mortality is so terrible: and is extremely seldom that Caesarian section is indicated.

In cases in which there is a succession of fits with a rising temperature and complete absence of albuminuria, it is well to bear in mind the possibility that the condition may be "status epilepti-

cus" and not eclampsia. Status epilepticus is best treated by heroic doses of bromides, and injections of luminal solution are of great value. In cases of true eclampsia in which the fits are numerous and severe, remarkably good results follow venesection, at least 8 ozs, and preferably 10 oz of blood should be withdrawn. In every case in which we have used this method we have found the fits stop immediately and do not recur. The blood pressure subsides and the patient stands the loss without discomfort.

COMPLICATIONS.

During the convulsions and the subsequent coma, every effort must be made to keep the patient off her back as there is very great danger of aspiration pneumonia. Bronchitis is a fairly common sequel of eclampsia, and pneumonia is unfortunately not rare and adds greatly to the gravity of the prognosis.

Less common sequelae are 1. Hyperpyrexia 2. Mania, 3. Ocular symptoms.

Hyperpyrexia: During delivery in cases of eclampsia it is quite common to find the temperature rises to 103° or 104° but it subsides spontaneously shortly after delivery, or it may be necessary to give tepid sponging should the fever persist. If the temperature does not subside soon after labor the lungs should be examined to see if pneumonia has supervened.

Occasionally one meets with hyperpyrexia 2-3 days after labor in which no other abnormality can be found. This is probably due to absorption of toxins produced during the convulsions. Not infrequently there is sapremia following eclampsia, this is due to a low grade infection. It is impossible to maintain strict asepsis when the fits are numerous, the patient is restless, and the bowels are acting as the result of purgatives.

In these cases it is most important that quinine should not be administered—the eclamptic convulsions have caused a great deal of cerebral congestion—if quinine is administered it intensifies this congestion, and the result may be an acute attack of confusional insanity lasting a few hours or possibly even for a few days.

Mania: As eclampsia causes such profound cerebral disturbance it is not strange that a very considerable number of the cases show marked mental derangement during the first week of the puerperium. We find that about 5% of the cases show mental confusion amounting almost to mania within the first week or ten days after delivery. The patient often remains comatose for a day or two, then begins to recover, and about the fifth day becomes restless and irritable. She may take a dislike to the child, or refuse to speak to her relatives. The next day she is usually violent, and needs forcible restraint. It

is difficult to nurse these cases in hospital as they are so alarming to other patients—it is therefore necessary to restrain them, and to keep quiet with drugs. As they are very difficult to feed and refuse medicines, or spit them out, it is generally essential to start treatment with an injection of Morphine alone, or in combination with Hyoscine. All movable articles should be removed from the patients' reach. One of my patients once threw a chair at the nurse: but I have not often found them so violent. They do, however, tend to bite the nurse or tear their own clothes.

This violent stage is treated with sedatives, Morphine gr. $\frac{1}{4}$ statim, Luminal gr. 3, or Monobromate of Camphor gr. 3-5 every four hours or Bromide and Chloral 20 grains of each four times daily,—the violent stage seldom lasts more than two or three days. The patient then makes a good recovery and goes home well within three weeks of the delivery. It would however, be interesting to watch these cases and observe if there is any permanent marked degree of intellectual impairment, as a result of the brain-storm which they have suffered.

Ocular Symptoms: In some cases the patient complains of dimness of vision, or even temporary blindness for a few days after the delivery. In my experience this is a rare sequel. It is quite possible that there is very marked visual disturbance after severe convulsions in a large number of cases; but it usually takes the patient some days to recover completely from the coma, and by the time she has recovered her mind, her eyes are practically normal. I have not yet seen any patient in whom ocular trouble persisted after eclampsia. When one considers the terribly serious renal condition, it is really remarkable that there is not a marked degree of permanent damage to the eye from albuminuric retinitis.

LACERATIONS OF THE PERINAEUM.

By

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A Perineal laceration is the bugbear of every doctor, nurse or student who attends a woman in labour. The occurrence of a perineal tear is almost always considered a discredit to the accoucheur.

The writer has had opportunities of observing the actual occurrence of many perineal lacerations and is led to consider that no amount of manipulation of the perinaeum will prevent it tearing. In his student days, the writer was taught that, when the presenting part distended the outlet of the vagina an even pressure should be

made on the perinaeum with the object of supporting it and promoting extension at the same time. Later on, this teaching was dropped as it was considered that continuous pressure on the perinaeum favoured rupture of that part by preventing it from being dilated to its fullest extent.

Owing to the curved shape of the birth canal (the curve of Carus) the force of the drive of the expelling forces falls via the foetus, direct on the perinaeum as soon as the presenting part reaches the pelvic floor, and if the presenting part is born before the outlet of the canal is large enough to allow its passage, the perinaeum must tear. Therefore, to prevent a laceration, only two things are possible i.e. (1) to prevent the expulsion till the outlet is fully dilated, or (2) to enlarge the outlet artificially.

When one considers the anatomy of the female perinaeum, one finds that it consists of two parts, viz, an outer part consisting of the perinaeal body and loose tissue covered externally by skin, and attached internally to the pubo-analis portion of the levator ani-muscles which form the second or inner part. This attachment of the outer to the inner part is so intimate that adequate dilation of the outlet of the vagina depends entirely on the relaxation of the pubo-analis muscles. In the virgin, the inner edges of these two muscles almost meet. Continued sexual intercourse separates them to some extent possibly by rupturing the attachment of their edges, posteriorly, but in the primipara their rigidity and tone are much more marked than in the multipara. Each labour, by trauma perhaps, brings about a change in the constitution of the muscles fibres in addition to the separation of their edges. It is true that lacerations of the perinaeum decrease in frequency with the birth of each child.

From observations of a large number of perinaeal tears, it appears that the laceration commences in the vaginal mucous membrane between the two edges of the pubo-analis muscles and spreads outwards and forwards to the fourchette: the skin, later, tearing from the fourchette backwards the anus. There may be only a small laceration of the skin with a deep vaginal tear but one never sees an extensive tear of the skin without a correspondingly large tear extending into the vaginal canal. In one case the writer observed, the perinaeal skin tore in the centre, the presenting part protruded through and the tear then proceeded forwards to the fourchette and backwards to the anus as the part was born.

The levator ani muscle may be regarded as a natural buffer guarding the weak tissue of the perineal body from trauma when the presenting part is born and when this rigidity is not too great and the driving forces are not too strong this function is admirably fulfilled. The very gradual relaxations of the barrier permits of a slow dilation of the vaginal outlet with the minimum amount of

trauma but there always is a certain amount of laceration which may not manifest itself externally. Sudden forcible separation of the muscles leaves the perineal body unable to adapt itself to the altered pressure and the laceration which has already occurred appears on the surface of the body.

The accoucheur will always be faced with an occasion where the perinaeum is in danger of being torn and he has then only one of the two alternatives, mentioned above, to fall back on if the child is alive. It is not always advisable to delay the birth and so the opening must be enlarged. The writer has made it a rule to perform an episiotomy in such cases, without hesitation, but he has found that in some cases, simple division of the skin and subcutaneous tissues has not been sufficient to prevent laceration. In cases where the pubo-analis muscles did not relax sufficiently, the writer has divided the inner fibres on both sides to the depth of about one centimetre with very satisfactory results. In a case of mento-posterior presentation where the position could not be rectified owing to the prominence of the promontory of the sacrum, and the foetal heart was good, delivery was effected by forceps after division of the inner edges of the pubo-rectalis muscle on either side. The edges of the incisions were co-apted with mattress sutures and the mother did not appear to be inconvenienced in any way.

The tone of the pubo-analis muscle and its contractions, while producing extension in a normal delivery, completely prevent the birth of mentoposterior presentation by jamming the forehead against the symphysis. The writer regards delay in "Crowning" of the head due to excessive tone as another indication for partial division of the pubo-analis muscle. Rapid delivery is facilitated by this simple operation and, in the writer's experience, perineal lacerations are averted. Another method of obtaining relaxation of the pubo-analis is by spinal anaesthesia but this is not always possible nor are the instruments always handy.

Suture of the lacerated perinaeum should be done as early as possible after delivery. The operator may, if he so desires, suture the levator ani muscles separately with interrupted catgut sutures, or be content with through and through sutures of silk worm gut or some such impermeable material. The tear in the vaginal mucous membrane should invariably be repaired as it takes longer to heal than the external skin. Asepsis cannot be hoped for owing to the proximity of the vagina and anus. It appears, however, that this very proximity establishes some form of immunity in the perineal skin and tissues to the organisms in the vagina and rectum because, if the perinaeum is not too bruised and the stitches are not tied too tightly, the tear heals without much trouble.

There is no doubt that the successful suture of a lacerated perinaeum depends very largely on the amount of bruising of the parts and the tightness of the sutures. If the vitality is greatly impaired primary union cannot be expected and the obstetrician must be prepared for a secondary repair. Tight suturing is to be avoided on account of the amount of oedema, and consequent constriction of the circulation. The perinaeum contains a lot of loose tissue and there is always a considerable amount of exudation after injury. The sutures should be tied just tight enough to bring the edges together. Ordinary cleanliness after each act of micturition and defæcation is all that is possible. The use of mild antiseptic and painting the suture holes & the laceration with Tinct. Benzoin Co. is of definite value but the employment of strong antiseptics are to be deprecated. In complete lacerations the bowels should be confined for the first five days: the diet being regulated to allow of as little residue as possible. On the sixth day, an olive oil enema is administered through a rubber catheter.

Occasionally one comes across a patient who complains of passing flatus through the vagina although the parts are apparently intact. It is very distressing for the patient as she has no control over the flatus. It is due to the formation of a minute recto-vaginal fistula and it is not always possible to detect it. The fistula closes in time and operative interference is not indicated, unless the fistula can be clearly defined and is easy of access.

PUERPERAL SEPTICÆMIA—ITS PREVENTION AND TREATMENT.

By

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EACH year we are finding that there is sufficient maternal mortality due to many causes and on most of them is the septicæmia after the child-birth. This septic condition can be avoided in many cases if special precautions are taken. Poor mothers who cannot afford midwives for their help die due to lack of knowledge of the care during and after the child-birth. At present they are benefitted to a certain extent by maternal welfare societies with their ante and postnatal hygienic help. I will here try to mention the causes of the puerperal septicæmia, their proper understanding and the actual treatment when developed.

Puerperal Septicæmia.—It is a septic condition of the generative tract following labour and occurring during the puerperium by the invasion of the pyogenic bacteria which subsequently spreads into

the blood causing generalised infection. It is an infection of the wound because after labour the mucous membrane of the genital canal is bruised and lacerated and thus forms a proper nidus for the growth of the organisms. The injury may be perineal tear, cervical laceration or uterine infection where the toxins are absorbed into the endometrium, then into the lymph spaces and from there through the lymph channels into the blood stream.

The infection is generally caused by streptococci Staphylococci, B. Coli and Gonococci though there are other organisms in rare cases such as Bacillus Diphtheria, Gas bacillus, Bacillus Typhosus, Pneumococci.

Reasons.—Such conditions which sap the patient's resistance against diseases are the predisposing causes of sepsis. They are anæmia, wasting diseases, general debility due to malnutrition, albuminuria—these are the troubles which drain the vitality of the suffering persons. The defensive mechanism of the body is lowered after prolonged labour, after severe hæmorrhage and in labour involving operative interference.

Primiparæ are more prone to infection than the multiparæ due to the fact of their prolonged labour and more genital laceration. The patient's resistance is also lowered in the following cases which are favourable for the absorption of the septic material into the blood.

- (a) Induction of labour by bougies or small rubber bags.
- (b) Exploration of the uterus for retained placenta—manual removal of the placenta is the most dangerous procedure for thereby the risk of infection is much increased.

It is a contact infection. The contacts being externally are—

External infection—(a) Dirty hands of midwives (b) Dirty instruments (c) Self-inoculation by the patient by fingering her genitalia (d) Coitus during the later months of pregnancy.

Infection by direct extension of the septic condition of the vulva or vagina into the uterine cavity. The septic condition may be particularly due to syphilis or gonorrhoea. The infection is first of all limited to vulva or vagina—then it ascends up into the uterus and from there it spreads to the tubes and then into the pelvic cellular tissues. Later on this infection develops into chronic inflammatory nature causing (a) Salpingitis (b) Oophoritis (c) adherent backward displacement of the uterus and (d) the sterility and its after-effect.

The infection from the vagina may be carried upwards by the administration of vaginal douches. The septic infection is relatively more frequent after abortion, miscarriage or premature labour than the labour at full term. The position of lying down, that is, the recumbent position of the patient in the early days of the puerperium

prevents the drainage of lochia which increases the chance of infection.

Clinical varieties.

- (1) Local infection.
 - (a) Ulcers—Perineal tear, and cervical laceration.
 - (b) Acute puerperal endometritis.
 - (c) Salpingitis.
 - (d) Parametritis—Infection to the peri-uterine connective tissues and broad ligaments.
- (2) General infection.
 - (a) Lymphatic sepsis—Peritonitis.
 - (b) Venous sepsis—Pyæmia.

Pyæmia—The thrombi at the placental site of the uterus are infected—they are subsequently changed into inflammatory nature which are carried off into the veins.

Phlegmasia alba dolens.—The extension of the inflammation from the lymphatics of the parametric tissues into the tissues surrounding the great vessels of the thigh and thus the inflammation spreads into the veins,

The venous sepsis may follow :—

- (a) Pluritic effusion or emphyema.
- (b) Malignant endocarditis.
- (c) Purulent arthritis.

Liver, spleen and Lungs remain soft, congested and oedematous.

Clinical findings.—First of all the fever appears and this comes on the 2nd or 3rd day after labour. The fever gradually rises up. The temperature is first noticed 100° F and subsequently it runs up. The temperature is continued and ranges from 103°—105°. Before each rise of temperature there is a rigor and this rigor is the response of the tissues when the fresh infected materials are thrown into the blood. The patient experiences severe chill. The face is flushed up and patient looks extremely distressed. Severe headache comes in. Eyes are slightly jaundiced and sunken down into the orbital sockets. The tongue appears dry, furred and coated. She feels thirsty. Pulse rate rises high and this depends on the rise of temperature. For every one degree rise of temperature there is an increase of pulse rate by 10. Pulse rate runs between 120—140 per minute. Lochia becomes scanty and it dries up. Sometimes it gives off offensive smell, so lochial pad should be carefully examined. Perineum should be examined to find out if there is any formation of ulcer or not. The flow of the milk diminishes. The course of the disease generally runs for one week. Blood examination shows leucocytosis and on culture 'B. coli' and 'Streptococci' are found. In extreme

cases flatulence of the abdomen is perceived—vomiting and diarrhoea will appear and the patient suffers from insomnia.

Prognosis—Depends on,

- (a) The onset of pyrexia.—If the fever comes delayed *i.e.*, 5—6 days after labour it is better but if it comes early *i.e.*, 1st or 2nd day after labour it is worse.
- (b) Persistence of high fever without remission. This is much more grave than the fever with remission.
- (c) The pulse rate.—if the pulse rate runs higher than 120 for long time the mortality rate increases.
- (d) The rigors—they are better than when the rigors are not present.

Treatment :—

Prophylactic—

- (a) During pregnancy—Anæmia, metabolic disorders should be treated and the general health should be properly picked up. Coitus should be forbidden during the later month of pregnancy.
- (b) In labour—cleanliness should be particularly observed in every way. The genitalia should not be handled with dirty hands or clothes.
- (c) In puerperium—Lochial pads should be absolutely clean. The perineal tear if there is any should be properly stitched up.

General.—The patient's vitality should be strengthened by giving her nourishing diet, putting in fresh atmosphere and keeping in well-ventilated rooms. Calcium and Iron Salts to be given for promoting the condition of the blood.

Mechanical.—The lochia is drained off by putting the patient in a reclining position—this postural treatment helps in the drainage of lochia.

Medicinal :—

Perineal ulcer.—Hot fomentations four times daily. Antiseptic dressings given after washing out with the Hydrogen Peroxide lotion. Uterus if noticed in a state of retroflexion should be properly replaced.

If the infection is localised in the uterus only the septic matter can be prevented from coming into the blood by the ligature of the pelvic veins *i.e.* of the broad ligament and ovary.

Pryor's treatment.—The posterior fornix of the uterus is plugged with a gauze. It draws stagnant fluid from Dougl's Cul-de-sac and sets up local peritonitis. This causes fresh adhesion and shuts up higher infection.

For the uterine infection.—One Iodoform gauze of 3" width soaked in 20% carbolic lotion is pushed into the uterus and kept for 24 hours.

Drugs by mouth :—

- (a) Quinine hydrobromide—gr. v doses three times daily.
- (b) Ext. Ergot Liquid— $\frac{3}{4}$ p. thrice daily or Ergotin tablet for helping subinvolution.
- (c) Purgatives should be administered for the elimination of the toxins.
- (d) Stimulants such as strychnine or Digitalin given if the pulse condition demands such.
- (e) Nuclin—A preparation from yeast is given 10 minims twice daily to cause artificial leucocytosis.

Injection :—

1. *Collosol Iodine* 20 cc.—given by intravenous route.
2. Some use normal saline $\frac{3}{4}$ i with 1 ounce of Eusol for intravenous antiseptic administration.
3. *Injection of serum*.—Antistreptococcus Serum (Puerperal antitoxin) 20 cc. given every alternate day.
4. *Vaccines*.—The effect of vaccines is increased by simultaneous use of serum. The autogenous vaccines are prepared from a pure culture of uterine lochia—Streptococci 5 million and staphylococci 25 millions are given every alternate day. If there is any sharp rise of temperature or increase in the rate of pulse we should surely wait for the next after dose.
5. *Blood Transfusion*.—Before the transfusion of the blood agglutination test is done outside by mixing the patients' serum with the donor's blood. The citrated blood is injected after the compatibility is tested. The transfusion is generally done in severe cases of anæmia and low vitality.
6. *Saline infusion per rectum*.—In much toxæmic condition the normal saline is given very slowly at a temperature of 100° and the quantity about 2 pints. The whole fluid is given for at least one hour and if necessary repeated 2 hours after noticing the condition of the pulse and its pressure.
7. *Remington and Hobbs Glycerine treatment*.—A rubber tube is intersted into the uterus and through this tube 5% Solution of Tr. Iodine in Glycerine is injected about 10 c.c. and is given daily. Glycerine is a non-irritating fluid which is powerfully hygroscopic and draws the lymph from outside into the cavity and this lymph has got phagocytic action over the leucocytes.

8. *Intra-uterine douching*.—This is very rarely given now-a-days for fear of the septic material being carried inside from outwards. If at all it is necessary to administer it, then a Boreman's catheter is introduced into the uterus and the cyllin lotion about 1 dram to 1 pint at a temperature of 100° F is given—the quantity given is about 1 quarter.

THE TREATMENT OF PELVIC INFLAMMATORY DISEASE.

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THIS article will be devoted to the consideration of the treatment of lesions either acute or chronic of an inflammatory type affecting the pelvic organs—either singly or collectively—the uterus, the tubes, the ovaries, the pelvic peritoneum and the pelvic cellular tissue.

The treatment depends to a large extent upon the causation of the pelvic inflammatory disease though the exciting cause of all pelvic inflammatory lesions is undoubtedly bacterial infection. It is variously computed that about 75% of the inflammatory lesions occur in the course of gonorrhœal infection. In the Harlem Hospital, New York, it is stated that the gonococcus was the inciting agent in 88% of the 1,105 cases of pelvic infection. But for the gonorrhœal infection the pelvic inflammatory lesions will lose much of the terror and the anxiety that these destructive lesions give rise to in the immediate sufferings and the remote invalidism ending very often in the sterility which is the great bug-bear of many a woman. Next in the order of importance about 15% of cases of pelvic inflammatory diseases owe their origin to puerperal causes—infection occurring after labour or abortion. The other causes of pelvic inflammatory lesions about 4% are tubercular infection of the tubes and disease of the bowels—vermiform appendix, cæcum and the colon. Less than 1% of the lesions occur as complications in the course of general systemic infections as typhoid, measles and post-operative infections. Lastly we have a very rare group of non-infective lesions—the result of extra uterine gestation, tubal mole, pelvic hæmatocele and hæmatoma of the broad ligament.

For the proper appreciation and understanding of the different lines of treatment that are employed or in vogue at the present time, not only a clear classification of the causes based upon the history, signs and symptoms and bimanual examination is useful and necessary but also the latest laboratory methods will have to be taken advantage of to clear doubts and institute proper lines of

treatment at the proper time. Treatment may be considered under the 3 main divisions:—

- I. Preventive and prophylactic.
- II. Expectant, palliative, symptomatic and conservative.
- III. Radical-surgical and operative.

I. *Preventive and Prophylactic*.—Much has been said about the prevention and very early treatment of gonorrhœa. But still gonorrhœa is spreading in the mass of the population. The remarks of the Cynic that "the index of a nation's civilisation can be measured by the degree of the syphilisation" holds good for gonorrhœa as well. The use of the condom, the antiseptic ointments, the douches and washes have not as yet checked the spread of the disease to any appreciable extent. The warnings of the family physician and of the social reformer have apparently not borne fruit to the desired extent. Still "hot passions leap over cool judgments." Under the circumstances there is no dearth of cases requiring careful and timely treatment. So long as men and women remain what they are, there will be pelvic inflammatory lesions caused by gonorrhœa and truly the harvest of the gynæcologist is abundant. The puerperal and post-operative lesions show no signs of abatement in spite of the modern advances in the ante-natal, natal, post-natal care and the ritual of aseptic surgery, due to improper understanding and appreciation of obstetrical and gynæcological lesions by the average practitioner. Unless and until the curriculum of studies of the modern medical student is so arranged that as much, if not more, attention is bestowed upon this branch of medicine there will not be any abatement of cases, puerperal and post-operative pelvic inflammatory lesions requiring treatment. It is a pity that those who are responsible for the present step-motherly treatment meted out to the study of Obstetrical and Gynæcological subjects have not as yet paid any attention to the dictum of Sir George Newham—that "the obstetrician and gynæcologist is the great example of the unity of medicine and surgery in actual practice." It is very sad to note that the average general practitioner has not sufficient knowledge either to diagnose or to treat pelvic inflammatory diseases due to faults beyond his control. Post graduate training will go a long way to the proper understanding of this subject.

II. *The expectant etc., plan of treatment*.—"The treatment of acute pelvic inflammatory lesions due to gonorrhœa is never surgical." During April 1927, the Sixth British Congress of Obstetrics and Gynæcology met at Manchester for considering the treatment of pelvic inflammatory conditions and six papers were read and discussed by such eminent Obstetricians and Gynæcologists as Aleck Bourne, Beckwith Whitehouse, Arthur Curtis, S.J. Cameron, Blair

Bell and Bethel Solomons. Opinions differed as usual, some were for immediate surgical intervention both for acute and chronic cases. But on the whole it may be said that the expectant plan of treatment was considered as the safest and the best line of treatment in the majority of cases. If the attack is mild and there is no large focus of suppuration, if the general health and resistive powers of the patient are good, nobody but a surgical maniac whose fingers are bent on mischief will advocate laparotomy with mutilation of the tubes and ovaries, or a clean sweep of the uterus and adnexa. Early and untimely interferences will be resented. There will be perhaps an extension of the infective process leading on to general peritonitis and death of the patient. Even if the patient were to escape so hard a fate, nobody is justified in sacrificing the uterus and adnexa for probable and possible complications later on. Of course conservatism in saving the tubes, ovaries and the uterus will not earn fabulous incomes or create great operative name and fame. No wonder George Bernard Shaw in his book "On Doctor's Dilemma" has had very hard things to say for the mentality of a certain class of surgeons. The expectant and conservative plan of treatment may be carried out as detailed hereunder:—

(1) *Rest.* The patient is kept absolutely at rest in bed in the Fowler's position. This position will help to lessen the pain, for the muscles are relaxed and any exudate due to the inflammatory process will collect in the most dependant part of the abdominal cavity—the Pouch of Douglas—and the general peritoneal cavity will be protected by adhesions which are beneficial in the process of conservation and repair.

(2) *Topical or local applications.* In the very acute stage where there is pain and high fever apply ice to the lower abdomen for the first two or three days. No purgatives, no vaginal douches are to be administered in the acute stage. For the relief of pain and to lower the temperature such antipyretic and analgesic drugs as aspirin, caffeine citras, phenacetine and pyramidon may be given either alone or in combination. A very useful prescription is the combination of all the above in 3 grain doses repeated 4th hourly if necessary. The usual diaphoretic mixture may be administered in these cases. If the pain is unbearably severe an injection of $\frac{1}{4}$ gr. morphia in combination with $\frac{1}{150}$ gr. of atropine sulphate or 1 c.c. of Omnopon injection will be found serviceable. If the bowels are costive or if there is some distension and meteorism, a medicated enema must be carefully administered. When the acuteness of the attack has subsided, hot vaginal douches as perchloride of mercury $\frac{1}{2,000}$ or lysol 1 dram to a pint, tincture of iodine 1 dram to a pint or corbolic lotion 1 in 80 may be administered twice daily. If there is severe pain

in the lower abdomen, institution of turpentine stupes, linseed poultices or hot Boric compresses are not only well borne by the patient but also will help in arresting and localising the inflammatory process and in absorbing the inflammatory products. The application of hot water bags, hot antiphlogistine, ichtyol on lint or the application of ichtyol, glycerine and belladonna will be found very useful to relieve the pain and help the absorption of the inflammatory mass. Under this plan of treatment the temperature will be reduced, the pulse will come to normal. The patient will no longer complain of pain and distension of abdomen. At this stage the bimanual examination will reveal in most cases fixation of the uterus with adnexal masses or lumps on both sides. If the uterus is moored into the pelvis with lumps on one or either side, order 4th hourly douches, medicated tampons, ichtyol and glycerine—into the fornices of the vagina after the douches; and permanganate of potassium (1 gr. to a pint) bowel washes twice daily. When the treatment is systematically carried out in this manner it will be found that the exudate is absorbed gradually leaving behind perhaps thickened tubes, partially adherent and tender ovaries and uterus. Medicated pessaries as iodex, Mulford's vaginal pessaries, Pontampons are all convenient forms of topical medicaments of the vagina and through the vagina the pouch of Douglas. Heliotherapy is practised by some for the purpose of the absorption of the exudate. Various forms of light treatment and diathermy are practised by others who claim to have effected many a cure—not only with absorption of the exudate but also restoration of the physiological functions. But in the acute stages the light treatment and diathermy are contra-indicated; but in the sub-acute and chronic cases they are said to be very beneficial. There are others who claim that they have cleared the pelvis of the exudate and the adhesions without operation by subjecting their patients to the curative action of the X-ray and the radium. The injection of 10 c. c. of glycerine into the uterus is found useful when the uterus is tender and enlarged and when there is continuous discharge from the uterus. It is also said to be beneficial in those cases where there is collection of matter in the tubes. Later on the injection of lipoidol will also be found useful not only to estimate the patency of the tubes or otherwise, but also for its curative effect in disinfecting the uterus and the tubes. For chronic pelvic pain and back-ache with chronic invalidism great benefit may be achieved by resorting to massage and hip baths and those who can afford it may make use of such watering places and health resorts as Courttalam and Tirukalukundrum.

(3) *Vaccine and Serum therapy.*—In gonorrhoeal cases during the sub-acute and chronic stages the gonococcal auto-vaccine or even the stock poly-valent vaccine will be found

useful in properly regulated doses. In puerperal pelvic inflammatory lesions puerperal vaccines as prepared in Guindy has been found very useful. In lesions due to mixed infections, the mixed infection phylacogen is considered useful by some. Where the streptococcus is the predominant organism the streptococcal polyvalent serum will be found useful in the acute stages. Large doses of the serum 10 c.c. every 4 hours or 30 c.c. per diem in a single dose may be tried for three days or until the temperature falls down. When the temperature, the pain and other symptoms continue in spite of the injections there is no use in continuing the injections. In all serious cases the co-operation of a competent bacteriologist should be sought for not only for purposes of diagnosis but also for the preparation of suitable autovaccines. When the patient is very much run down and is anaemic, the transfusion of immunised blood from a suitable donor has been found very useful. Some claim very good results from the nuclein and milk injection treatment.

(4) *Intravenous medication.*

- (a) *Iodine injection.*—Iodine in the form of neutral iodine (1 c.c.) or colossal iodine (10 c.c.) has been found very useful.
- (b) Cylotropine or urotropine (Schering) 5 c.c. are especially indicated in those cases where the B. coli group of organisms are the causes of the lesions.
- (c) Sulfarsenol and Neo-salvarsan are also found useful in cases of chronic and recurrent salphingo-oophoritis.

(5) *Glandular therapy.*—Thyroid gland extract has been used by some for its detoxicatory action and also for its general effects on metabolism and restoration of functions. Pleuro-glandular preparations such as hormotone, mixed gland (female) has been administered for the restoration of functions, the regulation of the menstrual cycle and their general tonic effects.

(6) *Drug treatment.* Drugs are of very doubtful value in the treatment of pelvic inflammatory diseases except for the relief of symptoms. Those that are used for their analgesic and antipyretic effects have already been mentioned above. There are other drugs that are used either for their special sedative action on the uterus or their tonic and alterative actions on the uterus and adnexa. Among them may be mentioned Liq. Sedans, liquid extract of prune leaves, tincture of belladonna and tincture of hyoscyamus and opium derivatives as catarrhine hydrochloride, stypticine, styptol etc., These drugs are often combined with calcium salts in cases of menorrhagia and metrorrhagia associated with pelvic inflammatory diseases.

III. *Radical or surgical and operative treatment.* All said and done, surgery has its definite place in the treatment of pelvic inflammatory lesions. There is danger to life if conservative plan of treatment is not combined with radical treatment in certain types of pelvic inflammatory lesions. It may be that some cases are lost by too early interferences as curetting and abdominal sections. But too much caution with a view to conserve the uterus and adnexa has resulted in chronic invalidism if not death of the patient. On the whole the first principle in surgery—where there is pus let it out—holds good here too. If there is a large pus tube it must be removed. If both the tubes are completely damaged you may conserve the uterus if possible; but perform partial hysterectomy and salpingectomy in the old or in a subject approaching the menopause. When there is a tubo-ovarian abscess perform posterior colpotomy and drain the abscess through the vaginal route. If you are not certain of your diagnosis, the abdominal route is to be preferred. Wherever possible conserve the ovary of one side and at least one tube also. Conservatism with regard to hopelessly damaged tubes is not only bad surgery but fraught with disastrous consequences to the patient. In chronic cases where the uterus is bound down by adhesions and where there are lumps or masses in the pelvis, after a thorough preliminary topical treatment of douching and tamponading the vagina in combination with diathermy and light treatment, if the adhesions and lumps do not yield to the conservative treatment sketched above and if the condition has led to chronic invalidism, sterility and painful periods, do not hesitate to open the abdomen. Gently separate the adhesions from the tubes, ovaries and the uterus, test the patency of the tubes by passing either cat-gut or probe to ascertain if the tubes are patent. If necessary open the fimbriated extremity and explore the tubes. If they are not patent perform salpingostomy and see that the edges of the opening made, be so everted and stitched as to keep the tube open into the peritoneal cavity. If the outer portions of the tubes are only damaged, remove the diseased portion of the tube and an artificial ostium be made in young women. In cases of small cystic ovaries, these small cysts may be punctured and cauterised or the diseased portion of the ovary only removed. If the ovaries are prolapsed and adherent to the pouch of Douglas they may be suspended, (after freeing them from their adhesions on either side of the uterus) nearer to the fimbriated extremity of the tubes. Retroverted and retroflexed uteri must be put up in their proper places by separating the adhesions if there are any, bringing the uteri up and maintaining them in the corrected position by a ventral fixation. Great care must be exercised in separating the adhesions formed between the uterus and adnexa or the intestines and the omentum. Wherever the peritoneum is separated

the raw surface so created must be covered by peritoneum or at least by omental transplants. In cases of pelvic cellulitis terminating in abscess formation the abscesses must be opened wherever they may point.

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CHRONIC PELVIC INFECTION IN THE FEMALE

BY

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THE problems associated with inflammatory disease in the female pelvis are so numerous and important and associated with so many far reaching physical and social consequences that, when the Editor of this journal kindly asked me to contribute an article to its pages, I had little hesitation in selecting this as a subject for discussion. Before discussing the individual lesions it might be well to consider the various ways in which the pelvic organs become inflamed and the mode of entry of the infection. Stress is laid, in some text-books, on the fact that the abdominal ostium of the Fallopian tube, by opening into the pelvic peritoneal cavity, completes a passage from the vulva, via the vagina, cervical canal, uterus and tubes into the peritoneal cavity, and that for this reason pelvic infection is more common in the female than in the male. But in the nullipara, or at least in the virgin, pelvic infection is little if at all more common than in the male, and we therefore have to look for some cause other than anatomical to account for the relatively increased incidence in parous women.

With the exception of tuberculosis, the most common types of infection are by the pyogenic organisms or by the gonococcus, and the clinical condition most often associated immediately or remotely with such infection is parturition or abortion. The main features connected with parturition are that the cervix has to dilate in a few hours up to a diameter of some three and a half inches, and that, whatever care be exercised, it is almost impossible to prevent a certain degree of laceration and bruising: secondly that during the

important early puerperal days the usual bactericidal acidity of the vagina is swamped by the alkaline lochia from above. Other factors at this time are that laceration of the perineum or vagina may occur and, if the labour be prolonged, physical exhaustion or haemorrhage may reduce the patient's general resistance to infection: but these last factors are not constant. In abortion the same conditions apply but on a minor scale.

With these preliminary considerations in mind we can now discuss some of the different lesions that are found.

As elsewhere pelvic inflammatory lesions may be acute or chronic, localised or generalised, and I propose to say only a few words about the most acute and the most generalised of all—*puerperal infection*.

Space permits only a few considerations of this vital subject. For years it has been known that the infecting organism is usually the streptococcus but more recently it has been found that it is not the ordinary streptococci, so often present in the healthy vagina, that are responsible: usually it is the specially virulent hæmolytic streptococci, while lately anaerobic bacilli have been shown to be responsible in certain cases. The pathology of the condition is still obscure. In general trauma and laceration with exhaustion, and blood loss, predisposes the patient to this infection, but in many cases the labour has been perfectly normal, while on the other hand many cases who have been subjected to much manipulation have an uneventful puerperium. Again the difficulties in coming to an accurate prognosis in any individual case are well known: while excessive pyrexia, rigors, rapid pulse, furred tongue, and abdominal distension are, in general, features of ill omen, many patients with some or even all of these signs recover, while others in whom the outlook appears more favourable succumb.

Regarding treatment, I propose to speak only in general terms. Many methods of treatment have been advocated but of late years our efforts have been applied mainly in the direction of maintaining the patient's resistance and in letting her fight her own battle. In this way, while the uterus in certain cases may be carefully and fully explored with the gloved finger, any such manipulation as curettage is contra-indicated on account of the grave danger of spreading infection and in general terms it may be laid down that the uterus should be interfered with as little as possible, even intra-uterine douching being omitted. The main local remedy of recent years is that of Remington Hobbs, who introduces glycerine into the uterine cavity by catheter on account of its hygroscopic effect and who reports good results.

In order to combat the infection in the blood antistreptococcal serum is administered, and at first the fault lay in giving too small

doses so that the method fell into disrepute: if any good effect is to be obtained at least 30 c. cm. and preferably 50 c. cm. should be administered daily, and at the same time a vaccine can be prepared from the intra-uterine contents. Recently good results have been claimed for scarlet fever antitoxins in 10 unit doses, and usually only one dose is necessary, but a second may be applied the following day. In the few cases treated by the antitoxin by the writer the results have been good but a prolonged trial over a large number of cases is necessary before a final opinion can be formed.

Inflammatory conditions of the cervix—*cervicitis*—are very common, being found in fully 75 per cent. of parous women but in a very small proportion of nulliparæ. In brief the condition is a chronic infection of a cervical laceration and the usual changes characteristic of chronic infection are present. Locally there is produced a red raspberry like area round about the split external os, an erosion, and the cervix becomes hypertrophied and hard, and later fibrotic. By the muscular circle at the external os being broken muscular traction tends to evert the cervical lips so that the canal is exposed and the condition of ectropion of the cervix produced.

Owing to the irritation of the chronic inflammation the natural secretion of the cervical glands becomes exaggerated, producing a sticky white or yellowish discharge—*leucorrhœa*—and the presence of this *leucorrhœa* in varying degrees constitutes one the most common symptoms of chronic cervical catarrh.

The condition seldom subsides of its own and usually goes on for many years, causing distressing symptoms.

Seldom is the cervix alone involved: by extension to the parametrium thickened bands are formed, laterally or in the utero-sacral ligaments, and iliac pain or backache produced. By extending upwards in the lymphatics of the body of the uterus, chronic metritis, with its attendant hæmorrhage is brought about: while further extension upward may produce salpingitis, salpingo-oöphoritis, and pelvic adhesions which may pull the uterus back in retroversion on to one or other side. In gonorrhœal cases involvement of the urethra and Bartholinian glands is very prone to occur.

But the most important and deadly sequel is carcinoma of the cervix, usually after a number of years of irritation, and practically all observers are agreed as to this relationship of these two conditions.

In the way of prevention little is possible. It is all very well to stress the importance of preventing cervical lacerations at childbirth, and this is, of course, most important. But during the most carefully conducted labour it is seldom that at least a slight degree of cervical laceration does not occur and chronic infection of the smallest breach of surface sets up and keeps up this condition and its complications. The earlier treatment is begun the more likely is pallia-

tive treatment to be effective. If the cervix of every primipara were inspected ten days after labour and any small laceration repaired the likelihood of further symptoms would be slight and the incidence of chronic cervical catarrh would be greatly reduced. Before the condition has become advanced with organic cervical changes much good can be done by medicated applications to the usually patulous cervix.

For success in this direction certain points are to be borne in mind.

- (1) The vagina should first be swabbed clear of discharge with lotion and then thoroughly dried with a gauze swab.
- (2) The leucorrhœal discharge should be cleared away from the cervical canal by a mounted Playfair's probe soaked in liquor potassæ: it is useless to make an application if the canal is plastered over with sticky leucorrhœal secretion.
- (3) With the posterior vaginal wall well held back with a speculum and with the anterior lip of the cervix steadied with a volsellum the application should be made under direct vision and with a mounted Playfair's probe, which should be passed not more than one inch up the cervical canal. This means that two pairs of hands are necessary if the application is to be properly made. Various medicaments are used, such as iodised phenol, formalin 10 per cent, a saturated solution of picric acid, argyrol, and several others.
- (4) The application has to be repeated. Usually twice per week is necessary and, even in a suitable case, cure is seldom attained under eight to ten weeks. This is the real difficulty about treatment and the main reason why it is so often abandoned.

Similar treatment is applied in gonorrhœal cases, but 10 per cent protargol to the cervix and to the urethral mucosa is one of the best applications in this condition. It has to be repeated usually about thrice weekly.

An ichthyol and glycerine vaginal pessary at night often increases the vascularity of the parts and so aids resolution. Vaginal douching may do much good or harm. Indiscriminate douching merely washes away the discharge and at the same time washes away the protective vaginal secretion. A douche, if employed at all, should be given by an experienced nurse, at a temperature of 100° and not more than twice weekly. Personally we seldom recommend douching. Diathermy has been used with success in

this condition especially by Cumberbatch and Robinson, and it is probable that its application will be extended in the future.

But if organic cervical changes have developed or if there is laceration with ectropion and eversion surgical repair is necessary or amputation of the cervix, and the result of such treatment on the leucorrhoea and associated pelvic discomfort is usually very satisfactory.

Chronic metritis is another condition often causing much trouble. It consists essentially of a fibrotic thickening of the uterine walls associated with an increase of perivascular elastic tissue so that the vessels are not properly compressed and haemorrhage, often very severe, is the main symptom. The main cause is chronic infection following subinvolution or from an infected cervix, and associated endometritis is often present. It usually occurs in patients between 40 and 50 years of age and usually in those who have borne children.

The condition is recognised clinically by enlargement of the uterus and especially by thickening of the walls. As regards treatment the usual uterine styptic such as ergot or pituitrin are of no avail, as the muscular tissue is so much replaced by fibrous. Again curettage is not usually satisfactory. The uterine mucosa in these cases may be either hypertrophic or atrophic, and while in the former type of case improvement, at least temporary, may ensue, in the latter type no benefit results from curettage.

With styptics and curettage, often repeated, failing, the next resort was usually hysterectomy, but the advent of radium has almost entirely replaced this as a means of treatment.

Under anaesthesia the cervix is dilated to No. 10 or 11 and the uterus explored. A tube containing 100 mgms of radium screened with 3.0 mms. of lead and covered with thin rubber is then inserted into the uterine cavity and removed after 24 hours. The bleeding may cease at once or only after a time but it is very rare indeed in such cases to meet failure. The amenorrhoea produced by radiotherapy is usually permanent, and the patient should be warned of this.

About *salpingo-oöphoritis* I merely wish to mention some general points and then to discuss the important matter of treatment. The causes are usually one or more of three, viz. pyogenic, gonococcal or tubercular, and in this order of frequency. The mechanism by which the ends of the tubes become sealed and the lumen distended by accumulating septic secretion is well known, but a very mild adhesive type of salpingitis has been demonstrated of recent years by methods of insufflation, in which there are no symptoms and in which no tubal thickening is palpable clinically. The main, indeed the only, result is gluing together of tubal walls or fimbriæ, and in this way sterility is brought about. By appropriate canalisation methods fertility has been restored in

many cases with this condition. An important point which has a great bearing on treatment is the fact that tubal inflammation tends so much to be localised. There may be omental and other adhesions, there may be pelvic peritonitis, but generalised peritonitis so often found in connection with, for example, the appendix, is extremely rare.

On this account our treatment of salpingitis and pyosalpinx is now largely palliative. On account of the risk of spreading infection it can be laid down that no case of acute salpingitis should be operated upon. Such cases should be put to bed rigidly, and kept on low diet. The bowel should be cleared if necessary at first by enemata and later by saline purges, while a warm application to the lower abdomen and a warm gentle daily vaginal douche increase the patient's comfort.

Under such treatment almost always the temperature subsides within a few days, the pain and tenderness clear up and, last of all, the pulse rate subsides. Examination at intervals shows often a surprising local improvement, and the primary extensive pelvic infiltration is replaced within about two weeks by a localised tubo-ovarian thickening which may completely disappear, so that in some 25 per cent of these cases operation can be avoided altogether and the patient sent home. In some of the others a local abscess may form and may rupture into the bowel, and in this way spontaneous cure is brought about. But where a thickened localised mass persists operative removal may be necessary, but this should never be undertaken in less than ten days after the subsidence of all symptoms. Under these conditions the pus is sterile, the operation is easier, and if some pus should be spilt during removal all that is necessary is to swab the pelvis clean. Drainage is not indicated, and we find that in 80 per cent of such cases healing is by first intention and when some wound infection does occur it soon clears up. In this way the delayed convalescence associated with drainage by tube is avoided.

By these methods of treatment it is very rare for a case of this sort to die. How different was the position in other days is shown by the old aphorism that operations on the tubes carried a greater death risk than operation on the uterus. In the same way a pelvic abscess should be palliated until the acute symptoms have subsided. By these means rupture into the rectum and discharge with spontaneous healing may occur, or a small incision in the posterior or lateral fornices may tap the abscess. In very few such cases is laparotomy indicated, and when so, simple evacuation with vaginal drainage is the best method of treatment.

Tuberculosis usually affects the uterine mucosa, Fallopian tubes, or pelvic peritoneum. Tuberculosis of the cervix or vulva is very rare and cannot be considered here. In some cases the infection would appear to be via the blood stream from some other focus, e.g. in the lung, but in many cases no such focus is to be found and it is a primary infection. The condition is often indistinguishable from a chronic septic or gonococcal salpingitis, and only at laparotomy may the presence of tubercular nodules indicate the nature of the condition. An important point in this respect is that a pyosalpinx in a virgin is very likely to be tubercular, and in a nullipara it is likely to be either tubercular or gonococcal.

In these cases operative removal is necessary, and usually one of two conditions is found at laparotomy. Either the affected tubes may stand up isolated and can be removed with the greatest of ease or they may be buried deep in almost inaccessible adhesions. In the latter case attempts at separation must be undertaken with the greatest gentleness and sound judgment must be exercised in determining whether the condition is removable or not. The danger lies in puncturing the bowel; in this event the subsequent fistula is always permanent and such an accident is to be avoided at all costs. Again hysterectomy should be performed at the same time, as the uterine mucosa is almost always found to be tubercular when the tubes are affected.

While these conditions have been considered separately, it has to be emphasised that in many cases more than one lesion is present. For instance, cervicitis is often associated with chronic metritis and, in a certain proportion of cases, with salpingo-oöphoritis, so that much careful judgment may be needed in applying appropriate treatment to such various co-existing conditions.

From what has been said it will be seen that in the treatment of gynaecological inflammatory conditions—and the same applies in many other conditions—the present day tendency is to replace major by minor operations and to replace operative by palliative and non-operative methods of treatment, and this is the right and proper line along which any branch of medical science ought to aim at progressing.

THE PRESENT POSITION IN THE TREATMENT OF CARCINOMA CERVIX-UTERI.

BY

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CANCER is not so infrequent in India as it was thought before, and cancer of uterus plays a great havoc in a woman's life. During the last 6 years 1,028 cases of cancer in general were found attending the Chittaranjan Seva-Sadan out-patients' Department and of whom 927 were carcinoma-cervix cases. Only 360 cases could be admitted for treatment.

An analysis of our cases shows that the youngest patient in the series is 19 years old and that although the greatest number of patients fall between 4th and 5th decade, about 25% of them are a victim to this disease in the 3rd decade. Practically all the patients are parous—a fact which might yield some results in the etiological investigation of the disease.

Persistent white or sanious discharge and irregular bleeding are the chief and earliest complaints, but unfortunately about 70% of them presented themselves for examination and treatment after the bleeding has started for 6 months to one year. *Pain is a very late symptom in cancer cases.* Once pain is started, the case goes beyond any form of effective treatment.

The beginning of cancer is very insidious. One gets the first signal when the bleeding has already started, that means when the growth has extended to a certain extent and eroded some of the vessels. Even at this stage, cases are not taken seriously enough in hand, which results in patients' waiting till they get severe agonising pain and their condition becomes hopeless.

Clinically, cases are divided into operable, borderline and inoperable ones, and this division has become almost classical. For all practical purposes, and to make the subject comprehensive to all, we have divided our cases into 3 clinical groups i.e., *Early* cases, *late* cases and *terminal* or *very late* cases. *Early* cases are those, where the growth has just started and is represented by a nodule or an ulcer chiefly located at the cervix and in the para cervical region. These cases are diagnosed quite accidentally when patients are examined for some other complaints and comprise only about 10.5% of cases. *Late* cases really suffer from disease itself by way of having irregular bleeding, white or stinking discharge and pain. The growth has infiltrated one or both parametria, base of bladder and recto-vaginal septum.

The uterus becomes fixed and infiltration is present in the utero-sacral region, which can be detected by rectal examination. *Terminal* or very late cases are represented by a "frozen pelvis" having metastasis either in the lumbar lymph nodes or in the distant organs. Patient is extremely cachectic and is down with severe agonising pain.

Morphologically, the cases have been divided into:

- (a) Proliferative type (30% of our series)
- (b) Ulcerative type (34% „)
- (c) Fungating type (20% „)
- (d) Hard indurative type (16% „)

Parametria and Lymphatic glands:—Wertheim has shown that in 22.5% of cases parametria remain quite soft in spite of their being infiltrated by cancer cells, while in 14% of cases, the area is indurated without being invaded by cancer cells. This induration is due to round-celled infiltration. This is an important point so far as management of cancer-cervix cases are concerned: it is not only the local growth which is to be treated but also the parametrial tissue as well no matter whether the latter is infiltrated or not. Similarly, the pelvic lymphatic glands—chiefly iliac and sacral group, should be taken into consideration because there is cancer metastasis in 25% of cases as evidenced by Wertheim from his 500 cases.

In our series, 60% of cases have got infiltration in both the parametria; and base of bladder is involved in 37% of cases. We have noticed that the left parametrium is more frequently infiltrated than the right. The present series shows that the left parametrium is involved in 76% of cases; it might be due to preponderance of left lateral cervical tear—a very common incident—during confinement.

Histologically we have followed Schottlaender and Kermauner's grouping of ripe, midripe and unripe cells. So far as Carcinoma cervix-uteri cases are concerned, the clinical grouping gives the best practical help, next comes morphological and last of all histological classification.

Historical review of Treatment:—Cancer cases were formerly regarded as hopeless on account of late detection and inefficient management. Cauterisation was the main line of treatment. Freund of Germany was the pioneer to take a rational step in treating cases by abdominal section (1878). About six months later, Czerny of Germany began to do vaginal hysterectomy in similar cases having a primary mortality of 32% in his 81 cases. Out of Freund's 95 cases, 65 died and the remaining 30 did not escape recurrence. Thus the abdominal operation for carcinoma cervix was given up for the next 20 years. Bardenheuer revived the abdominal operation by introducing vaginal drainage; and this simple modification reduced the mortality to 33%. Since then, surgical procedures have been

improved more or less continuously until 1895, when Riess, Rumpf and Clark simultaneously began to do extensive operations by removing not only uterus but also parametrial tissues, and the regional lymph glands. They had this initiative from surgical principles followed in treating cancer of the breast. But it was left to Wertheim to establish the technique of the modern radical operation. Schanta recommends radical vaginal operation claiming a very satisfactory result with minimum primary mortality. The proliferative growth was first curetted out, and the raw bleeding surface cauterised with benzene cautery. After injecting Adrenalin, Paravaginal incisions were given on both sides. In the process of operation, ureters were carefully dissected out and uterus removed with as much of parametrial tissue as possible. While Stoeckel (Bumms clinic) operates almost all his cancer cases by Schanta vaginal route, Wagner of Charité Francon Klinik follows Wertheim's radical abdominal method. The same thing is found in Vienna in the 1st and 2nd University Francon Kliniks respectively. Adler (Vienna) follows vaginal route, and always applies Radium immediately after operation.

Radiotherapy: During the last 2 decades, radium treatment in carcinoma has come into field and is slowly and steadily gaining ground both from palliative and curative standpoints. More recently radium treatment has been supplemented by Deep X-ray therapy. Radium acts by destroying cancer cells, and at the same time by stimulating the growth of fibrous tissue so that after a complete course of treatment one gets a soft scar in place of carcinomatous growth. Beta and Gamma rays have an effective value up to 7 c.m. distance if the growth extends more deeply than that area, radium rays cannot possibly have much effect unless Radium tubes and needles are buried inside the tumour. American workers and Brussels Radium Institute bury needles but the Radium Institute of Paris and Stockholm do not advocate it. We follow the latter school because introduction of needles may disseminate cancer cells, and the injured normal tissue might be unfavourably affected by radium, and thirdly owing to the devitalised condition of the party, there is more chance of sepsis. Intra abdominal application of Radium was recommended by Daels of Ghent, by putting radium alongside the iliac glands. It is not advocated now-a-days although Malcolm Donaldson is continuing this technique in St. Bartholomew's Hospital, London.

As radium can act effectively only within an area of 7 c.m., and intratumoral method not being very much recommended, the advanced cases are better treated by combining Deep X-Ray therapy with radium. According to Seitz and Wintz, lethal X-ray dose for

cancer is 90 to 110% of S.E.D. The uterus with its appendages and parametria lie about 10 c.m. deep from skin surface. In order to obtain 110% of S.E.D. in 10 c.m. deeper tissues, X-ray exposures have to be given from all sides, and the intensity of rays being accumulated at the seat of the tumour, we get the desired result, provided the X-ray machine works with really high Voltage tension.

Technique of X-ray and Radium Treatment in Seva-Sadan:— Deep X-ray therapy is done with Tropical Stabilivolt App. under the following conditions:

- (a) Current through ventil tubes 6.5 Amp.
- (b) Current through therapy tube 4 M.A.
- (c) Effective Voltage 180 K. V.
(Corresponding to 210 K.V. on the switch table).
- (d) Skin—target—distance 30 c.m.
- (e) Filters 0.5 mm cu and 1 mm Al.
- (f) Focus tube (compressor tube).

With 10×15 cm. portal of entry, exposures are given from 5 different portals *i.e.*, hypogastric, sacral, two lateral and vulval; and each time a full 'Skin—Erythematous Dose' is given. We follow our Sevasadan standard of S.E.D. that is, one causing reddening of Skin with raising of hair papillae within 3 or 4 days; the slight erythematous condition turning into bronzing of skin within 8 or 10 days, and ultimately leading into deep pigmentation within 6 weeks. We have estimated by Kuesture's Gauzing Apparatus, the "physical dose," and found that we require 600 R or 639 r (International) to get skin-erythematous Dose of Seva Sadan standard. It is slightly more than Ruestuer's standard, which is 550 R.

Radium is applied partly into vaginal vaults touching and covering the growth and partly into cervical canal or in the uterine cavity. In Vaginal application, radium tubes are put in a brass capsule of 1 mm. thickness, which is introduced in a thin rubber filter, which in turn is buried in stents (a kind of dental moulding substance,) made soft by plunging it in hot water. Thus when it is introduced in the vagina, the whole thing takes the vaginal contour and radiation evenly distributed to the growth. About 3,600 m.g.h. are given in vagina and 2,400 m.g.h. in the cervical canal, where radium is introduced by a special obturator having a 0.5 m.m. brass filter.

Generally we begin treatment with radium and supplement it with deep X-Ray. 6000 m.g.h. of radium are divided into 5 instalments, and applied at intervals of 4 to 7 days, and X-ray treatment given thrice a week. The second course of treatment, if required, is given after at least 3 months.

End results:—Uptil 1931, we have treated all our cancer cervix cases exclusively with Radium and Deep X-ray, and since the beginning of this year we have started a combined technique of operation and radiation. Out of 360 cases treated during the last 5 years, 98 cases could not be traced, and 69 cases took only the first or initial dose of treatment. For our statistical investigation, we have counted them all dead. According to our classification of early, late or terminal groups, we have got 38 cases *i.e.* 10.5% belonging to early group, and the rest *i.e.* 89.5% to the late group. Terminal cases were not taken up for the full course of treatment. 24 cases have been treated over 5 years and 16.6% (including both early and late ones) have passed through the conventional period of 5 years. If only early cases are considered, which are 6 in number, the % of cure goes up to 50%. Heymann of Forsell clinic (Stockholm) gives a 40.4% cure in all his operable cases. Rigand (Paris) 42% and Voltz of Doderlein clinic (Germany) 40.5%. In inoperable and operable cases combined, Heymann has got 22.1% (total number of cases being 737), Rigand 20% (total number of cases 350) and Voltz 15.4% (total number 1,319).

The table hereunder shows that our results of Radiation therapy in cancer-cervix cases in the Seva-sadan Women's Hospital do not fall far short of in comparison with the recorded results of the best European clinics, although our materials of the first year are not much.

Names of clinics.	Total number of cases treated.	Alive after 5 years.	% Cure.	Operable.				Remarks.
				Number of cases.	% Operability.	Alive after 5 years.	% Cure.	
Stockholm (Radium-met).	737	163	22.1	188	25.5	76	40.4	
Foundation Curie (Paris).	350	70	20	38	10	16	42	
Doderlein Clinic (Germany)	1319	222	15.4	227	17.2	92	40.5	
Sevasadan (Calcutta).	24 (360)	4	16.6	6	25	3	50	Cases of 1926 only are considered.

SOME REMARKS ON THE PATHOLOGY OF UTERINE CARCINOMA.

BY

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IN an attempt to comply with the request of the Editor of *The Antiseptic* for a contribution to the special gynaecological issue of his journal, I could not think of a better subject than *Cancer of the Uterus*. The subject interests both the Clinician and the Pathologist and as such I felt it might interest the readers of *The Antiseptic* which caters principally for the general practitioner in India.

The uterus has justly earned the not very enviable reputation of being the organ in the female that is most frequently the seat of carcinoma. It is generally held that uterine carcinomata constitute about one third of the total cancers in women. Uterine cancer has been reported in a child aged two years. My youngest case has been in a woman aged 22. It is, however, admitted that the incidence of cancer of the womb is at its height in the fifth decade. It is also a well-known fact that trauma exercises a considerable influence in the production of uterine carcinoma. The latter is thus known to occur most frequently in women that have borne children. The *cervix uteri* which is most frequently the seat of lacerations, is much more frequently attacked by cancer than the body of the organ. The latter only accounts for about 10% of the total and has no relation to child bearing. The Fallopian tubes are unusually free from cancer, though so frequently the seat of inflammation.

Structure of the Uterus. I do not propose to cover the entire field in this connection. To deal with the most salient points, the uterus, may be described as a hollow muscular organ more or less triangular in shape, with the apex downwards. At the latter portion it shows an opening into the vagina while at the base of the triangle it shows two openings, one on either side, continuous with the Fallopian tubes. The uterine muscle is unstriated and usually exists in two layers, an outer longitudinal layer which is very rudimentary in human beings and an inner circular which constitutes in the latter by far the greater bulk of the organ. The outer surface is covered by the peritoneum while the inner is intimately connected with the underlying mucous membrane or *endometrium*. The latter is lined with ciliated epithelium which is also continuous with that lining the Fallopian tubes. It should be clearly borne in mind that the vaginal portion of the cervix is covered with stratified epithelium which in most cases is found to penetrate the cervical canal for a variable distance. It should also be remembered that apart from the

stratified nature of the epithelium covering the vaginal cervix, the epithelium lining the remaining portion of the canal also differs considerably from that lining the uterine cavity, being thinner and higher than the epithelium lining the latter portion. The endometrium shows numerous unbranched tubular glands, generally convoluted towards the end. More rarely anastomosing and branching types are met with. The cervix shows fewer glands but it contains many mucous glands not infrequently filled with mucous plugs, the so-called *Ovula Nabothi*. The uterine vessels enter the organ through the broad ligaments from which they proceed to the fundus. There are many lymphatic vessels also. Those from the body run into the *lumbar glands* while those from the cervix terminate into the pelvic glands. This distribution is important in order to understand the distribution of metastatic deposits that may be found in the disease.

The Histology of Uterine Carcinomata. The gynaecologist usually classifies uterine cancer into *cancer of the cervix* and *cancer of the body*. This classification is not helpful from the histological point of view. Following Ruge and Veit we may divide uterine carcinomata into *carcinomata of the os*, *carcinomata of the cervix* and *carcinomata of the body of the uterus*. Since we recognise an internal and an external os we may with advantage describe the first group under the name of *carcinoma of portio vaginalis*. These three types of cancer differ greatly in their histological characters, and hence possibly in their mode of origin. It is not, however, possible to draw a hard and fast line as to the exact place of origin of these growths, as it is not unknown for a squamous cell carcinoma to occur where one would expect an adeno-carcinoma. This evidently applies particularly to the cervix. Those that following Cohuleim advocate the theory of "embryonic rests" in explaining the production of cancer, would necessarily invoke epithelial inclusions to explain such anomalies, though, as I have already mentioned above, it is not unusual for squamous epithelium to penetrate the cervical canal for a variable depth.

Carcinoma of the vaginal cervix occurs in two forms. One variety shows typical cornified papillae with the production of epithelial pearls. A good number of those we meet in Indian Hospital practice are, however, of the basal cell type, keratinisation being conspicuous by its absence. This type, therefore, shows no epithelial pearls. Many cervical cancers show eosinophilic infiltration and many show giant-cells, a feature that in my earlier experience in pathological work used to puzzle me considerably. It should be noted however, that giant-cells in cervical cancers are mentioned by many authorities. Not infrequently one notices evidences of septic invasion in cervical carcinomata. One is faced with the fact that carci-

noma may supervene on a previously eroded cervix, already the site of septic trouble, though it seems more probable that many cases may show septic infection after the growth has started. Thus, it is well-known, as previously stated, that a simple erosion may show malignant changes later on and sometimes one notices on such growths considerable ulceration with the production of a cauliflower growth (*papillary carcinomata*). Though admitting that these growths may originate in other ways, I have been struck with their frequency when they start on an erosion. If no external lesion is apparent, cervical cancer usually begins as a hard nodule and more often may not show a cauliflower growth.

Carcinoma of the supravaginal cervix is generally an adenocarcinoma. The reason for this is probably that it begins in the cervical glands. Sometimes, however, one meets with a squamous-cell carcinoma. The possible explanation of this type of cancer has already been given.

Carcinoma of the body of the uterus may either be localised to a portion of the womb or it may be diffuse. In the former case it may form localised nodules while in the latter the whole uterine cavity may show villous or warty excrescences. The tumour may either start in the surface epithelium or may commence in the glands themselves. In structure the growth is an adenocarcinoma though very rare instances of a squamous-cell carcinoma have been described by some authorities (Hermann).

Course and spread of uterine cancer. The spread of uterine cancer is not uniform. In most cases it is slow, specially when the body is attacked. Hence many cases if treated early may not show any recurrence. Even the two great groups of cervical and body cancers do not extend in every case in the same manner. As just mentioned, cervical cancer spreads more rapidly and in most cases it gets to the cellular tissues first, fixing the uterus by growing around it. Extensive ulceration may occur in some cases into the cervix before any marked spread takes place. Localised peritonitis and even general may occur as a consequence of this ulcerative process. If the growth is anteriorly, the bladder may be involved, if posteriorly, the rectum; if upwards and backwards the ureters may be obstructed with consequent pyelitis. Secondary growths in the kidneys have been reported. The vagina and the urethra may often be involved and erosion of vessels with fatal hæmorrhage is not unknown. The pelvic and sometimes even the inguinal glands may be involved in secondary deposits. On the other hand, cancer of the body spreads very slowly as above stated and possibly its earliest spread is into the myometrium and Fallopian tubes. The lumbar glands are the next to be involved and possibly secondary growths may be found in the liver and the lungs in rarer cases.

Cancer and pregnancy.—I have two specimens in my museum of cancer with pregnancy. The question to decide is as to whether a pregnant uterus has become malignant or whether a malignant uterus has become pregnant. I think both conditions may be met with, though it is a difficult matter to solve in every case. The extent of involvement is unfortunately no criterion of age in a cancer. It is well-known that some growths spread more rapidly than others. Some reliance has in these cases to be placed on the history available but as this does not concern me, I should prefer to leave the question for those that are more competent to speak on the subject from this point of view.

BLOOD SEDIMENTATION TEST AND ITS APPLICATION IN GYNAECOLOGICAL AND OBSTETRIC PRACTICE.

BY

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THIS test has recently been used widely in medicine, surgery and gynaecology. It has been extensively used for tuberculosis, where it gives a very good index of the progress of the case. Its main use is for the early detection of inflammatory lesions. It is a very delicate test and reveals the activity of a lesion when general disturbance is absent or slight. It is said to be more trustworthy than the indications afforded by pulse rate, temperature or leucocyte count. In gynaecology its chief use is for the detection of some complication which may have been missed by ordinary clinical examination.

Causation of increased rate of sedimentation:—The actual cause of the increased rate of sedimentation in certain conditions is not known. It may be due to increased fibrinogen formation. It has been suggested that it may be produced by some specific ferments, increased cholesterol content of blood or altered electrical charges of the corpuscles.

TECHNIQUE.

There are various methods for carrying out the test. The method described below is Morriss's modification of Westergren's technique.

Apparatus required:—One 1 cc. pipette graduated in hundredths, having an internal diameter of 2.5 mm.

A rubber cap which accurately fits the pipette.

A rack which will hold the pipette in an upright position.

One 2 cc. record syringe.

One test tube.

4 cc. of 3.8% solution of sodium citrate is drawn into the clean dry syringe and then blood from an arm vein is drawn into the

syringe accurately up to the 2 cc. mark. The mixture is emptied into a clean dry test tube and thoroughly mixed. The mixture is then drawn into the 1 cc. pipette until the upper level of the fluid is exactly at the zero mark. Rubber cap is then applied to the tip and the pipette is placed vertically in the stand.

The sedimentation rate (S. R.) is measured by the depth of the clear fluid on the top of the red cells. The result is expressed in percentage of the total column of blood in a given time and can be read off directly from the graduated pipette, e.g., if the clear fluid reached .05 cc. mark, the reading is five. The important readings are taken at the intervals of one hour and two hours, although some people consider one reading at the end of the first hour to be enough.

Uses of the test in Gynaecological and Obstetric practice:—

Normal nonpregnant woman:—

The S. R. for normal nonpregnant woman varies from 2%—7% in one hour and 6%—18% in two hours. Menstruation has very little effect on the S. R.

*Intra-uterine pregnancy without complications:—*The S. R. is increased after the fourth month of pregnancy. Apparently after the formation of the placenta certain changes occur in the blood which alter its physical and chemical properties and increase the S. R. The S. R. increases with the age of pregnancy.

*Intra-uterine pregnancy with complications:—*A positive Wassermann Reaction.

Some observers found an increase of S. R. in about 80% of patients, others found an increase in only 11% of cases.

*Pyelitis:—*Increased.

*Eclampsia:—*Increased in most cases.

*Pre-eclampsia:—*Increased in about 60%.

*Accidental haemorrhage:—*Generally increased in those associated with albuminuria.

*Albuminuria:—*Generally increased.

*Puerperium:—*S. R. is usually raised for the first 10 days, then gradually diminishes and reaches normal after the first month if there is no infection.

It is raised in sepsis and the most rapid rates occur when there is acute inflammation associated with pus formation.

*Extra uterine pregnancy:—*Ectopic pregnancy shows the same S. R. as normal pregnancy. So it is of some value in differentiating pelvic inflammatory lesions from ectopic pregnancy. Ruptured ectopic with fresh blood in the peritoneal cavity will increase the S. R. So tubal rupture with hæmatocele as well as pelvic inflammation produce a raised sedimentation rate, consequently it is very

difficult to differentiate between these two conditions by mere S. R. The S. R. in inflammatory lesions is usually very rapid in the first hour, whereas in cases with blood in the peritoneal cavity it has been found that the S. R. is more rapid in the second hour.

*Inflammatory Lesions:—*Most gynaecologists prefer conservative treatment of pelvic inflammations and recommend that operative treatment if indicated should be carried out when the lesion is quiescent. It is rather difficult to recognise when this quiescent stage has been reached. Some people recommend operation about 10 days after the temperature has been normal. Blair Bell advises that if vigorous bimanual examination causes fever, operation should not be undertaken. S. R. gives the best indication about operability in these cases. If the S. R. falls to normal, it shows that the inflammation has settled down. With a pus sac S. R. may fall but never reaches normal. If operation is done when the S. R. is over 30% there is great risk of complications arising after the operation. If the S. R. is below 30% there is very little risk of complications.

A decreasing S. R. indicates good prognosis, But the best indication is obtained when it is combined with leucocyte count.

Increased S. R. may indicate the presence of inflammatory lesion but the height of S. R. has no relation with the degree or virulence of the infection.

*Ovarian Cyst:—*The S. R. is usually normal. If it is raised it indicates the presence of some inflammatory complication, local or general.

*Carcinoma of cervix:—*Falta believes that the S. R. is increased, and in most cases it is increased in proportion to the extension of the disease. Others are of the opinion that the raised S. R. may be due to the associated inflammation as most of these cases are infected, and that there is no relation between the S. R. and the extent of the disease. The view generally accepted is that the test is of no value as regards prognosis or treatment.

CONCLUSION.

Therefore it is evident that blood sedimentation test cannot replace clinical judgment, but considered with careful physical examination and accurate history, it will enable the physician to make a finer diagnosis. It will be a valuable aid in gauging the results of treatment as it is of greater value when carried out in the same patient. If it is done in all gynaecological cases before abdominal operation is undertaken, it may make one suspect some unexpected condition and put the surgeon on guard and may save much trouble to the patient or even avoid an unnecessary operation.

ASCHHEIM-ZONDEK TEST FOR THE DIAGNOSIS OF PREGNANCY.

Principle.—A hormone derived from the anterior lobe of the pituitary gland is excreted in the urine of pregnant women. This urine when injected subcutaneously in infantile female mice produces changes in the ovaries. The first change caused by the hypophyseal hormone is growth of the follicles and their rupture. Then hæmorrhage occurs into the enlarged follicles and their rupture. Then hæmorrhage occurs into the enlarged follicles and finally atretic corpora lutea are formed.

Technique.—For each test five infantile female mice are used. Each receives six subcutaneous injections of the suspected urine, which is not sterilised. Three injections are given on the first day and three more on the second day. Each dose is, 2 cc. for mouse No. 1; 25 cc. for mouse No. 2; 3 cc. for mice Nos. 3 and 4; and 5 cc. for mouse No. 5. The mice are killed by coal gas 100 hours later and the ovaries are exposed. Normally the ovaries are about the size of a pin's head. After injection with pregnant urine they are three times their normal size, red in colour and marked by yellowish projections corresponding to corpora lutea; or the projections may be of a cyanotic colour due to hæmorrhage into the follicles or corpora lutea may be seen. Naked eye examination is usually sufficient for a positive diagnosis, but if necessary, sections may be cut and examined under the microscope.

Correct result has been obtained in 98%. In case of hydatidiform mole, the urine gives a strong positive reaction. The reaction is positive only so long as there is living fætal tissue. Therefore it is positive in cases of ectopic pregnancy, and abortion only for a short time after the death of the fætus.—*P. C. Dutta.*

OBSERVATIONS ON THE ACTION OF THE VARIOUS SUBSTANCES USED FOR CONTRACEPTIVE PURPOSES.

The following is the summary of the conclusions arrived at by Carlton and Florey, published in the *Journal of Obstetrics and Gynaecology of the British Empire*, Vol. 38, No. 3:—

It is impossible to force material from the vagina into the uterus. So any presence of spermatozoa in the uterine cavity which may be seen soon after coitus, is due to intrinsic motility of the male germ cells.

Antibion, chinisol, quinine (in cocoa-butter and gelatine), semori and speton do not produce any observable lesions in the vaginal mucosa. Some shedding of the mucosa was noted after the injection of finil, but there was no inflammation.

Spetonex caused ulceration of the vaginal mucous membrane in rabbits but did not have any effect on that of dogs. The delicate epithelium of the rabbit's vagina is damaged by some substance contained in spetonex, while the stratified mucosa of the dog (similar to that of the human being) is unaffected.

Quinine and urea regularly produced an intense vaginitis in both rabbits and dogs.

Chinosol, quinine (double strength in cocoa-butter) and semori have got no effect on the normal endometrium of rabbits. Formol was likewise harmless in concentrations up to just under 1%.

Quinine and urea in certain concentrations produced necrosis and sloughing of the endometrium.—*P. C. Dutta.*

THE X-RAY AS A DIAGNOSTIC AGENT IN OBSTETRICS AND GYNAECOLOGY.

BY

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THOUGH other clinical methods have reached such a high degree of accuracy that the aid of the radiologist is seldom required, Radiography is insufficiently used in Obstetrics and Gynaecological diagnosis. The impression that X-Rays might cause injuries to the Fetus during a diagnostic procedure has been disproved and it is firmly established "that no pregnancy regardless of its stage of development is damaged by diagnostic roentgenology properly carried out." Ante-natal radiographic examinations is a definite additional diagnostic method of value in reducing maternal and fatal mortality rate.

The Obstetric conditions for radiographic examinations can be classified as follows:—

1. Those relating to the maternal pelvis—deformities (Kyphotic or rachitic), pelvimetry, bony or calcified pelvic tumors, separation of pubic symphysis, and amount of healing after pubiotomy.
2. Those relating to extra-uterine pregnancy. Tubal and abdominal pregnancy.
3. Those relating to intra-uterine pregnancy: Diagnosis of early pregnancy before characteristic signs and symptoms appear, multiple pregnancy, presentation and position of fetus, cephalometry, death of fetus, monsters, anencephalus, hydrocephalus etc., spina-bifida and other skeletal defects, syphilis of fetus, hydatidiform

mole (by exclusion), intra-uterine fractures, osteogenesis imperfecta, illegitimate pregnancies in which no examination can be made, diagnosis of pregnancy presentation and position in very fat women, and as a routine examination before caesarian section.

4. Those relating to pelvic tumors simulating pregnancy as fibroid tumours, myomas and pregnancy, ovarian cysts and dermoids.
5. Miscellaneous conditions like spontaneous version, pseudocyesis, mechanism of labour, mode and method of separation of placenta, lithopedion, location of placenta (amniography) and proof of extra-uterine life.

Rubin's test, pneumoperitoneum, and injection of lipiodol into the uterine cavity are not advisable in diagnosis of early pregnancies, however, the last method is the best and most useful in knowing the condition of the uterine cavity and patency of the tubes in various Gynaecological conditions.

Ventro-dorsal films assist in showing a twin pregnancy, hydrocephalus, malformations of the fetus and abnormal positions. But this does not give any information concerning the relation of the head of the foetus and the pelvis of the mother—only a lateral view is useful. However, internal pelvimetry by X-Rays after Roberts as described by Kerley is of considerable help, an axial view being taken. The patient is placed in the sitting position on the Potter Bucky Diaphragm. An adjustable bed-rest supports the shoulders and the legs are stretched out in front. The plane of the pelvic brim is obtained by calipers, one foot of which is placed on the upper border of the symphysis pubis whilst the other foot is placed in contact with the lower border of the spine of the fourth lumbar vertebra. The patient is then moved until the pelvic brim is parallel to the film in the Bucky Diaphragm. The tube is so placed that the central ray strikes the pelvis about 2 inches behind the symphysis. A tilt is necessary to get the anticathode vertically above the pelvic brim. The distances from the anti-cathode to the symphysis (say 27 inches) and from the anti-cathode to the film (say 32 inches) are then measured. The true diameters are obtained by multiplying the X-Ray diameters by $27/32$.

Thus if X-Ray diameters of the brim are:—

Antero Posterior	4.7 inches.	
Oblique	5.3	27
Transverse	5.9	32

The real diameters are 4 inches, 4.5 inches and 5 inches respectively.

With good technic, the fetal shadows should show on the X-Ray film, from the 12th week on. Soft rays, preliminary enema, empty bladder, Potter-Bucky Diaphragm, long film-focus distance of 30 or 40 inches are requisite. They will be faint except in perfect films and show the spine as a row of beads and the occiput as a crescent; later the thin lines of the rib cage are shown. The oblique position is often helpful when the parts are small and overlies the Sacrum. After the 4th month, with good technique a positive diagnosis should be made without exception, unless the patient is very stout. Demonstration of the ossified epiphyseal center of the lower end of the femur is considered the best X-Ray evidence of the fetus being at term. Shortly after death an overlapping of the cranial bones of the fetus occurs, due to decrease in the pressure of cerebrospinal fluid and this is well shown in the films. However, it should be borne in mind that during labour the skull is compressed and deformed on account of the pressure caused by the uterine contractions.

There is no danger when lipiodol is injected for radiographic examination for intra uterine and tubal diseases, provided it is done with care and cases chosen after due consideration of contraindications. During haemorrhage and menstruation, and in acute and subacute inflammatory diseases with elevation of temperature, the method is definitely prohibited. In pregnancy, injection might cause abortion or the resorption of iodine might harm the fetus. In cases of carcinoma and malignant disease of the endometrium though much information might be obtained by the irregular ragged filling defects caused, the method should not be sought, for fear of causing implantation of malignant cells into the abdomen by mechanical pressure. In cases of tubal pregnancy the patient will have to be kept in bed in the clinic for fear of rupture. Chronic inflammations are suitable and better information can be had than air injection regarding patency of the tubes, as sometimes lipiodol enters the tubes which failed to fill with air at a pressure of 200 m.m.

The appearance of normal uterus and tubes is identical with that described by anatomists, uterus as an inverted triangle, with two tubes running laterally from the sides of the triangle near its base and lipiodol after entering the tubes slowly leaks into the peritoneal cavity through the fimbriated openings. Normal contractions can be noticed on careful examination. In atony the sides of the triangle are convex while in hypertonic uterus they are concave instead of the normal smooth almost straight lines.

Congenital anomalies, duplex uterus, uterus bi-cornis and displacements are easily identified. An acute ante-flexed uterus throws a triangular shadow with the base below and when traction is applied tilts itself and shows the normal inverted triangle. Submucous polyps cause round semi-circular defects. The real value of the

method is in the diagnosis of the cause of sterility where it cannot otherwise be obtained except by a laparotomy. Obstruction due to tumours of uterus; obliteration of the tubes as a result of inflammations and adhesions; placental remains; thickened endometrium, fibroids and cysts causing filling defects in the cavity; aplasia, hypoplasia or atresia of the cavum of the uterus—can all be diagnosed. In hydrops of the tube where patient has alternate watery discharge the oil is seen in globules in the tube as it is not miscible with the fluid. In tumours of the tube and tubal pregnancy and ovarium cyst the oil travels around the tumour and fills the space between the distended tube and the tumour or ovum or cyst as the case may be. The uterus may be displaced to opposite side and the other tube bent and curved. In malignant tumours of the ovary lipiodol getting into the abdominal cavity is seen to float on the fluid of the co-existing ascitis.

In fine, with the large amount of clinical material at hand, I hope Radiologists and Gynæcologists will work together and help in throwing more light on diseases peculiar to the "fair sex". With the present improved methods and the safety in procedure assured the radiologist with the assistance of the expert Obstetrician and Gynæcologist or vice versa, must be able to come to a definite diagnosis of the condition, and also give the patient the benefit of an early decision as to further treatment.

ANAEMIA OF PREGNANCY WITH SPECIAL REFERENCE TO ITS PREVALENCE IN LABOUR CLASS OF ASSAM.

BY

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Introduction:—The occurrence of an anæmia in pregnant women of pernicious nature approximating to pernicious anaemia of Addison has been recognised long since, but elaborate studies have been made only recently by Esch in Germany in 1917, Osler in England in 1919 and Rowlands and Barabee in America in 1924 and 1925 respectively. In India, the presence of a severe anæmia in pregnant women resistant to all forms of treatment and which cannot be otherwise accounted for, is always encountered with, but very little facts about it were known to us till recently. Dr. Margaret Balfour conducted a systematic investigation under the auspices of Indian Research Fund Association in 1925. She herself observed 150 cases in Bombay and Major McSwiney reported on 43 cases from the Eden Hospital, Calcutta and their reports were published in 1927. The malady has since then been recognised to have a

different entity from Addison's anæmia. While investigating the causes of maternal mortality in India under the same Fund, the problem was subsequently studied by Dr. Lucy Wills and her co-workers in 1930, who have contributed further knowledge about the disease. In recent years, isolated attempts have been made by different clinicians to study the condition from a clinical aspect, nevertheless, in consideration of the important role it plays as a cause of maternal and foetal mortality in India, the condition deserves further observation, wherefrom an easy and effective form of treatment may evolve. In the following columns, the writer intends to give here a resume of the knowledge so far achieved by different workers in India in course of the past few years supplemented by his own observations at the end.

Occurrence and distribution:—It constitutes a very high percentage of maternal deaths, 35.65 per cent of all deaths in Bombay lying-in-hospitals. Balfour found its incidence per 1000 labour cases to be 64.2 in lying-in-hospitals, whereas it was 25.7 per thousand labour cases throughout the country. Dr. S. Mitra (1931) of Chittaranjan Seva-Sadan, Calcutta has recently published a report of cases admitted in Seva-Sadan Women's Hospital, in which it is stated that during the four years 1926-30, 86 cases were found to be pregnancy anæmia, the total number of labour cases being 1,883, that is 45.6 per thousand.

It is prevalent amongst all classes, the Hindu, Mohamedan and Christians. Said to be commoner during the second half of the year. About thirty per cent. occur in primipara. Common under thirty years of age. It is most common amongst poor, who live under unhygienic conditions and feed on deficient and under-caloried diet.

Mortality:—It has a very marked effect on both maternal and infant mortality. These patients manifest a tendency to miscarry owing presumably to death of foetus *in utero*, but sometimes progress rapidly after labour. When the infant is born alive, deathrate is about 50 per cent. (Balfour—68.3 %, Mitra—52.8 %). Forty-two per cent of mothers died in Balfour's series of cases and in Mitra's series it was 29 per cent. In Wills and Mehta's series of 50 cases selected for treatment, 15 died before and two during treatment.

AETIOLOGY.

The anæmia though encountered long by the medical profession in all parts of the world, yet very little light was thrown to its causation as it was essentially confounded with pernicious anaemia of Addison. Since its recognition as a separate entity, various theories have been put forward by different observers to account for its causation and it is difficult to arrive at a definite data as yet.

Nevertheless, the writer will endeavour to discuss here the essential features likely to participate in the causation of the disease.

The anæmia having some resemblance with Addison's pernicious anæmia was attributed to some microbic infection of the gut and attempts were made in Bombay to find out *B. Welchii* or some hæmolytic streptococci as the causative agent. Acton in a personal communication to Dr. Wills expressed that he thinks it to be related with a streptococcal or other infection of the intestines but the experimental and bacteriological evidences so far achieved could not establish any definite organism 'to be at the root of the evil.' Animal experiments with *B. Welchii* or hæmolytic streptococci have failed to produce the typical blood changes, nor any of these organisms were constantly present in the gut of all cases observed. Both in Balfour's and Will's series of cases examinations and cultures of blood, stool and gastric juice were held and though variable but numerous organisms were found in almost all of them, some probably due to puerperal sepsis so often present in these cases, yet so far no single organism could be held responsible for the condition.

Attempts were also directed to establish toxæmia as the primary ætiological factor and some suggest that a toxin derived either from the foetal, placental or maternal parts is responsible for the anæmia. Heymann has found a lipoid substance which can produce hæmolysis *in Vitro*. This normally breaks down maternal blood cells and is found both in placenta and blood. Probably pathogenesis of anæmia depends upon this or any other toxic substance derived from placenta and which has a special predilection for hæmopoietic system. The theory of toxæmia is further supported by pathological examination of liver, where a histological change in the nature of degeneration is noticed in some cases.

The clinical evidence, however, does not support toxæmia, as unlike the toxæmias of pregnancy such as eclampsia, hyperemesis etc., the blood pressure in pregnancy anæmia is much lowered and the characteristic changes in blood chemistry is not found. Nevertheless, this is not sufficient to exclude toxæmia as the causative factor as the investigation conducted is not sufficient and it awaits further research works.

The possibility of its causation from some deficiency in diet has been studied from all aspects by Dr. Wills, Mehta and Talpade in Bombay and their works deserve mention here. They made a hygienic and dietetic survey of the different classes of women in Bombay and so also of the 40 cases of anæmia of pregnancy. The women were from different sects and communities and having different habits. They observed the persons who live on diet deficient on caloric value, total and animal protein and fat, vitamin A and C and salt have been suffering from certain degree of anæmia. They arrived

at the conclusion that the anæmia in question is mainly due to prolonged intake of diet deficient in vitamins A and C or some factor associated with it, pregnancy being a contributory cause. A deficiency of vitamins B and D and of proper amount of animal fat also participate in a subject whose diet is short of vitamins A and C.

Subsequently attempts were made to produce similar anæmia in animals by diet deficient in vitamins A and C, and a series of experiments were conducted on albino rats with due attention on another control series. All rats fed on the deficient diet, especially the pregnant ones developed an anæmia of "Bartonella" type. This observation confirmed their former theory that the anæmia in question was essentially due to diet deficient in vitamins A and C, pregnancy being a contributory cause.

The lack in general hygienic principles in expectant mothers to which the poor and middle class people are subjected to, supplemented by prolonged living on unbalanced and undercaloried diet and an undermined state of physical health, brought about by infectious diseases, malaria, dysentery, hookworm etc., may all be supposed to play some part in the causation of the disease.

Pathological anatomy:—Mitra held a pathological post mortem examination in four cases of anæmia of pregnancy and has found the following changes to be present:—

Liver:—Size large, very pale and friable. Fatty degeneration of the central part of the lobule accompanied by extravasation of blood. Peripheral parts, quite healthy. Deposition of hæmosiderin in peripheral liver cells and in Kupffer's cells but is absent in central zone. This fatty degeneration of cells around the central lobular veins and hæmorrhage beyond it points to toxæmia as the probable cause. Such degeneration of the central portion of the lobule is also noticed in acute yellow atrophy of liver and hyperemesis gravidarum. There is erythrophagocytosis in peripheral areas indicative of hyperactivities of cells of reticuloendothelial system.

Spleen:—Enlarged in 41.3 Per cent. of cases. Proliferation of cells of reticuloendothelial system. No signs of degeneration.

Bone marrow:—Aplastic changes present. Yellow marrow almost occupies the whole field.

SIGNS AND SYMPTOMS.

Onset:—The disease comes on insidiously. During the latter months of pregnancy, the woman gradually gets pale, suffers breathlessness and palpitation on exertion. Face becomes puffy, tongue, conjunctivæ and gums white. The patient develops a flabby appearance. Oedema at first appears on eyelids, ankles and feet and then gradually becomes generalised. One peculiar feature of the

All the above cases have been found amongst coolie women who are permanently engaged in tea garden work. Their routine work consists of plucking tea in open tea fields, where tea is grown. The working hour is from morning till evening except few minutes' leave at noon for tiffin. They are regularly paid their weekly wages, which may be regarded as not less than that required for their maintenance, but their habit is such that only a small part of it is utilised for food, the rest being spent on drink. Usually they take some fried rice and salted tea before they go to work and after return from day's toil after 5 p.m. they take *dal* and rice cooked either together or separately. They take little vegetables, little fish or meat and very little fat either animal or of vegetable origin. Of course there are some who take vegetables and only they that get a supply of vitamin of some kind. The amount of food they take may be regarded as less than what they actually require, still they maintain a fair state of general health. The only thing which may be regarded as nature's blessings and which probably compensates for deficiency in diet is direct sun light and fresh air available during the whole day in their working place. One thing which most of them indulge in is the country liquor (*harial*) for which they spend the major part of their earning and almost all of them remain drunk at the week end. The prevailing diseases in the garden are : malaria, hookworm, dysentery and common respiratory ailments.

TABLE II.

Showing the social habits and duration of illness of *Anæmia of Pregnancy* cases.

Serial No.	Name.	Caste.	Occupation	If indulged in alcohol.	District of birth.	In the garden.	Date of admission	Date of discharge or Death.	Duration in hospital.	Result.
1	Batasi	Tanti	Plucking	Yes	Sibsagar, Assam	From birth	22nd June '31	9th Aug. '31	49 days	Cured
2	Kamini	Mahli	"	"	"	"	16th May	25th July	71 days	Died
3	Sukumari	Tanti	"	"	Cuttack	15 Yrs.	24th Nov.	24th Dec.	30 days	Cured
4	Sadhni	"	"	"	Sonpur Orissa	6 months	18th Aug.	3rd Nov.	78 days	"
5	Khaburi	"	"	"	Cuttack	15 Yrs.	27rd Sept.	30th Oct.	38 days	"
6	Gurubari	Dhara	"	"	Purulia	14 Yrs.	18th Oct.	7th Dec.	51 days	"

The facilities for a complete bacteriological study are not ideal here and my diagnosis is based more on clinical data than on laboratory findings, still it may be regarded as sufficient to arrive at a diagnosis for a practical purpose. In table III a brief description of the cases has been incorporated from which the readers will find that four of the cases were admitted for breathlessness, œdema of ankles and legs and the patient did not make any other complaints. Almost all cases were early *paras* and all of them were admitted with less than 40 per cent. of hæmoglobin. Some sort of pulmonary complications arising out of œdema of lungs were met in two. Case 4 was of much clinical importance; condition of blood and amount of hæmoglobin did not improve even under treatment with liver extract, rather percentage of hæmoglobin went down to 20 just before confinement. She also suffered from irregular fever and developed sepsis after delivery. Intermittent fever was encountered in four cases sometime during the disease, but careful blood examination revealed negative result for malarial infection. Progress under treatment has been found to be very slow and unsatisfactory unless patient had aborted or delivered and rapid improvement followed confinement. Three cases developed diarrhœa one dying of it. All cases were discharged when hæmoglobin was barely above 50 per cent.; they were given light out of door works, kept on iron and arsenic and all of them regained full amount of blood in course of about two months. In none of these cases, a history of any disease and anæmia following it could be elicited.

TREATMENT.

Preventive:—From the early months of pregnancy, proper attention should be paid towards the dietetic and hygienic condition of an expectant mother. Diet should be liberal, well caloric, in an assimilable form and must contain all principles in proper amount including the vitamins. Plenty of fresh green vegetables and fruit juice should be included in the diet list. Animal fat in the form of unadulterated *ghee* and butter may be used daily. The expectant mother should spend at least some hours of the day in open air and should indulge in moderate exercise. Exposure for a certain period of time in morning and evening sun is a very wholesome habit and must be insisted on. They should be occasionally visited by the family medical officer and at the least sign of anæmia systematic treatment should be commenced.

Curative:—The hygienic and dietetic line as described above should be followed in every case of anæmia. Green vegetables and plenty of vitaminous substances should be given daily. Milk, cream, butter, cod liver oil, yolk of egg and other sources of vitamin A and D should be contained in the diet table. Chicken soups and various

case is that the patient retains a certain amount of working capacity even when she has developed a high degree of anæmia. Sometimes the patient is admitted in the hospital with some other complaints and on examination severe anæmia is noticed. Often the patient comes for treatment a month after the appearance of symptoms.

Alimentary tract:—Signs of intestinal disfunction viz., diarrhœa, loss of appetite, vomiting and sore tongue may be present.

Fever:—Fever is usually present sometime during the illness.

Cardio-vascular system:—There may be slight cardiac dilatation and hæmic bruit is often present. There may be signs of secondary pulmonary congestion when œdema has been generalised. Blood pressure is always low, systolic pressure being about 100 m. m. Hg. or below.

Blood:—Blood picture has a close resemblance with that in pernicious anæmia of Addison and varies with degree and progress of anæmia. All forms of abnormal red cells may be encountered but general feature is of macrocytic type. Anisocytosis is more or less always present. Pokilocytosis is often present but is less marked than in Addison's anaemia. Normoblasts and nagaloblasts, both may be present, the former predominating.

Total count of red blood corpuscles is extremely low. In Will's cases the average was 960,000. In Seva-Sadan Hospital, Calcutta, 40 per cent. of cases had a count below one million, in 53·7 per cent. of cases between one to two millions and only in 6·3 per cent. of cases the count exceeded two millions.

Total leucocyte count reveal more or less leucopenia. There is variation in normal percentage of varieties, the polymorphs are diminished, (56·4%) whereas lymphocytes may be increased (35·5%). In Seva-Sadan cases, a tendency to leucocytosis has been noticed. In post partum cases, slight leucocytosis may be encountered with, which is perhaps due to sepsis which is commonly met with in these cases.

Platelets:—diminished in number.

Van den Bergh Test:—gives low figure for bilirubin.

Chemical analysis:—Non-protein nitrogen is increased but calcium and phosphorus value is lowered.

Test meal:—Achlorhydria is rarely present.

Urine:—Fairly normal in chemical test though amount is reduced specially when heart is weakened. A cloud or trace of albumin may be present in some cases.

Labour:—In 9 out of 10 cases, the labour is premature occurring spontaneously (Mitra) but it has an important prognostic value as these cases react well to treatment after confinement.

Differential diagnosis:—It is conspicuous from its mode of onset, in the absence of any history of having previously suffered from

such diseases as malaria, kala-azar dysentery etc., and anæmia dating from it. Its association with advancement of pregnancy and absence of marked emaciation before progress of anæmia (which is usual with secondary anæmia) are other important features in its recognition.

The resemblance of clinical manifestations with Addison's anæmia sometime leads the unskilled clinicians to considerable difficulty to arrive at a certain diagnosis. However, absence of some constant findings in pregnancy anæmia, which are common features in Addison's anæmia such as achlorhydria, nervous symptoms like multiple neuritis, posterolateral sclerosis and other spinal cord lesions such as increased reflexes, characteristic lemon-yellow tint and jaundice is likely to help diagnosis. Incidence of age and sex and absence of marked remissions and exacerbations are also important points. Where facilities permit, examination of blood is always helpful.

Similar anæmia is sometimes noticed following different helminthic infection such as hookworm, bothriocephalus latus etc., and in such cases, examination of stool is suggestive of diagnosis. But in countries where hookworm infection is endemic, the anæmia cannot necessarily be attributed to hookworm infection, only because of the presence of ova in the stool, as such infection is even common in apparently healthy people. In such cases other features should be considered to arrive at a true and accurate diagnosis.

OBSERVATION ON ANAEMIA OF PREGNANCY AMONG LABOUR CLASS OF ASSAM.

Having considered the importance of the disease as a cause of both maternal and infant mortality, a close watch on all cases of pregnant women was kept during the year 1931 and careful history was elicited from all cases of women admitted for treatment of anæmia. To my surprise, the disease has been found to exist among my patients who are mostly coolies and hence I propose to record here my observations on these cases. Presumably the number of cases is too small; however the author is very much interested to know if similar observation has been made anywhere else.

TABLE I.

Showing the occurrence of *Anæmia of Pregnancy* cases and confinements.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Total confinements	2	3	3	3	3	1	2	4	2	2	6	3	34
Anæmia of Pregnancy cases	...	...	...	...	1	1	...	...	1	1	1		6

easily digestible meat extracts available in the market may be given with advantage to keep up the strength of the patient. Half a pound of fresh liver and $\frac{1}{4}$ pound of red meat may be given daily or frequently if there is no digestive trouble.

Some vitamin preparations are being used now a days and are said to have given satisfactory results. Green-Armitage (1932) has used marmite (vitamin B) in a consecutive series of, 50 cases in Eden Hospital, Calcutta, in which the clinical and pathological conditions improved rapidly and the results were not inferior to liver extract. It may be given two teaspoonfuls twice a day in cold water or in soup. Bemax may be used in its substitution.

Liver:—Liver extract has been used by many clinicians all over the world and is said to be the best remedy known. When the patients' digestion allows, fresh liver is said to be more effective, but in the writer's experience, many patients cannot digest it, the gastrointestinal tract already being in a diseased state, and some object to take it being of animal origin. Intravenous injection of liver extract (Hepatex P.A.F., Lescher and Evans) is said to be very effective and has been extensively tried in Eden Hospital, Calcutta. Mitra has used abroma angusta liq. as an adjunct to liver treatment.

Blood:—Direct transfusion in bad cases should be resorted to when a donor is available but ordinarily intra-muscular injection of whole blood in 15–20 c.cm. frequently gives quite satisfactory results. Injection of adrenalin chloride solution may be given frequently to keep heart and tone of blood vessels.

Deep X'ray therapy:—Fractional doses of deep X'ray on liver, spleen and heads of long bones to stimulate the reticulo-endothelial system and formation of red cells seem to give gratifying results and the clinical results achieved by Mitra in Calcutta bear this evidence.

Artificial termination of pregnancy:—In desperate cases only, some advocate artificial termination of pregnancy by deep penetrating X'ray exposure. In others spontaneous termination brings better prognosis.

Iron and arsenic:—These drugs cannot be relied on at all but Green-Armitage has used ferrous carbonate in ten grains doses three times daily in very early cases, when it is said to do some benefit. The writer has used them in convalescent cases when the blood regeneration had already started.

Treatment of complications:—They should be treated as they arise and on general lines. Diarrhoea, generalised anasarca and oedema or passive congestion of lungs are distressing complications and often cause much anxiety to the attending physician. Special care should be kept on diet and at the slightest intolerance it should be readjusted. A simple recipe containing a tea spoonful of bismuth carb, sodii bicarb and osmokaolin often checks motions. General

TABLE III
Showing the Details of ANÆMIA OF PREGNANCY Cases. [Vol. XXIX, No. 7]

Serial No.	Name.	Duration of Pregnancy	Complaints on Admission.	Parity.	History of previous illness.	Hæmoglobin on Admission per cent.	Stool.	Malaria Parasite.	Urine.	Abnormal Cells.	Duration in Hospital.	Complication during Treatment.	Confinements.	Hb. on discharge per cent.	Result of Treatment.	Remarks.
1	Patasi.	20 $\frac{1}{2}$ months.	Oedema & breathlessness.	Had aborted twice before.	Nothing recently.	35	.....	Nil	Trace of albumin.	Poikilocytes Normoblasts.	49 days.	Fever oedema of lungs Influenza.	Delivered a child at 8 $\frac{1}{2}$ months.	55	Cured	Keeping alright.
2	Kamini.	22 Delivered few days ago.	Pneumonia.	1-para.	Had oedema of legs in latter months of Pregnancy.	30	Round worm Hook worm ova.	Nil	Normal.	Poikilocytes Normoblasts.	71	Diarrhoea.	.....	..	Died.	.....
3	Sukumari.	30 Aborted few days ago.	Oedema of legs, anæmia.	3-para.	Nothing recently.	30	.....	Nil	Normal.	Poikilocytes slight leucocytosis.	30	Nil.	Aborted at 8 $\frac{1}{2}$ months.	50	Cured	Keeping alright.
4	Sadhni.	22 7 months.	Oedema of ankles, breathlessness.	1-para.	Nil Oedema developed insidiously.	40	.....	Nil.	Trace of albumin.	Poikilocytes Normoblasts Megaloblasts.	78	Puerperal Sepsis Oedema of lungs.	Delivered a child at 8 $\frac{1}{2}$ months.	50	"	"
5	Khaburi.	30 Delivered few days ago.	Breathlessness & anæmia.	1-para.	Nothing recently.	35	.....	Nil.	Normal.	Poikilocytes.	38	Fever.	.....	55	"	"
6	Gurubari.	16 Aborted.	Puerperal Sepsis.	1-para.	"	30	Round worm ova.	Nil.	Normal.	Poikilocytes Moderate leucocytosis.	51	Diarrhoea Fever.	Had aborted at 9th month.	55	"	"

anasarca arising specially when the heart cannot compensate does not become amenable to treatment. In such cases 0.5 to 1.0 c.cm. of navasurool intra muscularly at weekly interval often brings down the œdema readily. It should be remembered that it is a preparation of mercury and poisoning is apt to follow in some cases. I have tried it in some cases with gratifying results. I have also used Pulv. Jalap. Co. in dram doses every alternate day in obstinate œdema without causing any untoward effect. In distressing cough due to pulmonary congestion, glykeron may be given in teaspoonful doses frequently, which will bring relief and may even cause sleep in some patients, who suffer from insomnia.

SUMMARY.

1. Anaemia of pregnancy is a primary form of anaemia of pernicious type and is prevalent in many provinces of India including Assam.
2. Its pathogenesis is believed to depend on one of the following factors :
 - i. Microbic infection.
 - ii. Toxaemia of pregnancy.
 - iii. Deficiency of some factors in the diet.
3. A full resume of the subject is dealt with in the text including the treatment. Liver and its derivatives are the known best remedies for the condition.

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A SHORT STUDY OF AYURVEDIC OBSTETRICS.

BY

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"There is no doubt that the Indian doctors were well versed not merely in Medicine and Surgery, but in prevention of disease and Operative Midwifery"—Castellani and Chalmers (Manual of Tropical Medicine).

In these days of national awakening no special apology is necessary for my humble attempt to put forward what Ayurved has to say about Obstetrics. Spasmodic attempts have been made during the last fifty years to explore the ancient medical literature of India with some degree of success, but more determined and constant efforts are required to convince a present day medical man who is dazzled by the splendour of Western learning about the real value of the same.

A question may be raised as to why such an important and useful science passed into oblivion and now stands in need of revival. The answer is sad and brief. In the past, the knowledge was transmitted by the Guru or preceptor to his pupil orally till recently in the history of Ayurved about 2000-200 years B. C. some distinguished scholars like Charak, Sushrut etc., thought of collecting some of the valuable knowledge in a book form. Their books are written in the form of short professorial notes on which perhaps the preceptors expanded while actually lecturing. During the warfare days that followed in India thereafter, study of Ayurved could not be followed in the lecture-form and the explanatory portion lapsed leaving behind only the text of the notes. In the absence of the amplification of the preceptors the mystic hymns are found difficult to interpret and at present their study can only be made in the light of the Modern Medicine. We strongly hope that the obscurities that still exist in some parts of these books will be enlightened by further advancement of Modern Medicine.

The origin of the science and art of Obstetrics dates back to the birth of the first human being on this earth. It is natural, therefore that advances in these branches of medicine are more startling than in others. It is in this region that one becomes greatly impressed about the thoroughness and perfection attained by Indian Medicine in the past.

Sushrut, Charak and Vagbhat are the main sources of our knowledge about Ayurvedic Obstetrics. The date when Sushrut prospered is still disputed. Some scholars put him even more than

2000 years B.C. while others at about 600 years A. D. Charak and Vagbhat are believed to have flourished about the Christian Era and 800 years A. D. respectively. If priority of Sushrut is established as many are lead to believe, Ayurvedic Obstetrics can as well be called Sushrutian Obstetrics.

It is not possible to deal with Ayurvedic Obstetrics in all its details in such a short article. Hence the author will attempt to outline only its main features. An endeavour will be made to describe the subject true to the Texts unless when it becomes extremely clumsy to do so. Authenticity of the statements will be made clear by copious references to the original Sanskrit Texts. The author of the article does not claim any originality of thought or elegance of style and will deem his attempt a success if his article amuses some and stimulates at least a few of its readers to investigate Indian Medicine in its different aspects.

1. ANATOMY.

Anatomy appears to have received less attention than Physiology. It is disposed of by describing the Vagina and the Uterus. Shape of vagina has been compared to the navel of a conch shell consisting of three involutions, uterus remaining inside the inner involution—*(शङ्खनाभ्याकृतियोनिसंस्थावर्ता सा प्रकीर्तिता)*¹

Here if Yoni is taken to mean external genitals instead of the vaginal canal, the three involutions of which it is said to consist can be easily explained. They are from without inwards Labia Major, Labia Minor, and the margins of the incomplete Hymen. Then the position of the uterus in the third involution i.e. inside the Hymen becomes clear. It is also described as situated between the small and large Intestines. *(पित्तपकाशयोरमध्ये गर्भाशया यत्र गर्भस्तिष्ठति)*¹

Shape of the uterus has been compared to the mouth of a Rohita fish—narrow in front representing the Cervical part and broad behind representing the body of the uterus.

Fallopian Tubes and Ovaries do not appear to have been known at that time from the following:—

*आर्तववहे द्वे तयोर्मूलं गर्भाशय आर्तववाहिन्यो धमन्यश्च ।*¹
Artava carrying (ducts) are two having their origin in the uterus etc.

2. PHYSIOLOGY.

Phenomenon of Menstruation—

The reproductive life of a woman is defined to be from the 12th year, when the menses start upto the menopause at about the 50th year *(द्वादशादूर्ध्वं याति पञ्चाशतः क्षयम्)*.⁴ During this period the menses flow every month for three days *(रजस्त्रीणां मासि*

अहं वहेत्). The normal menstrual blood is slightly discoloured and darkish. (ईषद्विवर्णः कृष्णश्च). The characteristics of normal menstruation are that it should not be prolonged for more than five nights (पञ्चरात्रानुबन्धि)³, should be neither very excessive nor very scanty (नेवातिबहु नात्यल्पं)³, should not be accompanied by pain or burning, or be thick (मासान्निषिच्छदाहार्ति)³ and should not leave stains on cloth (यद्वासां न विरञ्जयेत्).¹

Conception—

The proper age for child bearing is considered to be sixteen years (पूर्णषोडशवर्षा स्त्री पूर्ण विशेन संगता । वीर्यवन्तं सुतं सूते ।)¹. A healthy son is born if a woman over sixteen years cohabits with a man over twenty years of age. If the ages of either are less the child may be a still born (कुक्षिस्थः स विपद्यते)¹ short lived (जातो वा न चिरं जीवेत्)¹, or feeble (दुर्बलेन्द्रियः). Hence a girl of tender age should not be fecundated (तस्मादत्यन्त बालायां गर्भाधानं न कारयेत्)¹.

First twelve days after the menstrual period are described to be the most favourable for conception while the rest not. (त्रयोदशी प्रभृतयो निन्द्याः)¹. This has been lately demonstrated by Prof. Von Ott (Havelock and Ellis, Chapter XI, Von Ott's Charts).⁵

Conjugation during menstruation cannot result in the fertilization; hence the days of active flow should be avoided for the company of wife (तस्मान्नियमवर्ती त्रिरात्रं परिहरेत्)¹. The reason given is that just as a thing thrown in a stream is carried with it and cannot go against its current (प्रतिनिवर्तते नाध्वं गच्छति)¹, so the sperms are washed down during the menstrual flow.

"Fertilizing coitus may occur at any time in relation to menstruation except when menstruation is actually taking place."⁶

Just as ghee melts when fire is by the side, so also ovum is dislodged and glides during intercourse with a male (विसर्पत्यार्तं नार्यास्तथा पुंसां समागमे)¹. This supposes that ovulation can be stimulated reflexly by sexual union. If instead, in connection with the melting of the ghee विसर्पति is taken to mean 'melts' or 'expands,' then the ovum may be said to liquify reflexly to become one with the spermatozoa that may be ejected.

Co-ordination of the following four factors (चतुर्णां सान्निध्यात्) is necessary for the development of a healthy foetus as for that of a healthy plant. They are ovulation period or proper season (ऋतु), a healthy uterus or a healthy soil (क्षेत्र), nutrient liquid or water (अम्बु), and semen or seed (बीज).

3. THE FOETUS.

In the first month after conception the foetus is only in a gelatinous condition (कलल). In the second month it becomes more condensed (घनः सञ्जायते). In the third, it develops five buds (पिण्डिका) for head and four extremities. In the fourth month the limbs are further developed, heart appears and shows signs of life. Mind (मानस) and cognition (बुद्धि) are said to appear in the sixth month perhaps pari passu with the development of the brain. In the seventh month, all the organs undergo further development. Full term delivery takes place in the ninth or tenth month.

Though the development of the organs is explained month by month, still all the organs appear simultaneously in a rudimentary form in the beginning and hence are imperceptible. (सर्वाण्यङ्गान्युपाङ्गानि युगपत्संभवन्ति हि । सूक्ष्मत्वान्नोपलभ्यन्ते)¹. This diminutive human body when it appears first after fertilization of the ovum is described as formed of 24 elements (एवं चतुर्विंशतिभिस्तत्त्वैः । सिद्धे वपुर्गृहे)¹. The figure 24 is very striking in the light of our present knowledge that Chromosomes which bestow parental characteristics on the fetus are 24 in number.

The foetus derives its nourishment through the Umbilical Cord (गर्भनाडी) and also derives a part of maternal respiration. The child grows as a result of the throbbing that is going on at the Umbilicus (गर्भस्य नाभिमध्ये धमनिवातश्च देहस्तेनास्य वर्धते)¹.

4. PHYSIOLOGY OF PREGNANCY.

Diagnosis of Pregnancy.

That conception has occurred recently may be known from the following symptoms (सद्यो गृहीत गर्भायाः लिङ्गानि)¹ :—

Sense of fatigue (श्रमः), Langour (ग्लानिः), Thirst (पिपासा), Discomfort in the thighs (सक्थिवेदनं), Non-return of semen and menses from the vagina (शुक्लशोणितयावन्धः), and Throbbing of the genitals (स्फुरणञ्च योनेः). These earliest signs of fertilization do not appear to have been mentioned in the text books of Midwifery.

Following signs and symptoms appear later on in the course of pregnancy :—¹

Darkening round about the nipples (स्तनयोः कृष्णमुखता), appearance of row of hair (रोमराज्युद्गमः), drooping of the eye-lids (अक्षिपक्ष्माणि संमीत्यन्ते विशेषतः), vomiting, perverted sense of odour, watering of mouth (प्रसेकः), and lassitude (सदनं). Pica or longings of pregnancy (दोहद) appear in the fourth month when the foetal heart develops; the woman is then known as Double-hearted

(दोहदिनी).¹ The longings of a pregnant woman should be gratified (यदिच्छेत्तस्यै दापयेत्) to alleviate the discomforts of gestation (गर्भाबाधभयात्), and to ensure the birth of a healthy child. Non-fulfilment of her longings (अलब्धदोहदा, दोहदे अवमानिते) may prove dangerous to herself and to the foetus; it may also result in a deformed foetus (विकृताकृतिः).

Diagnostic signs of male and female conception have also been described.¹

Hygiene of Pregnancy.

Immediately after a diagnosis of pregnancy is made, a woman should be advised¹ to refrain from all sorts of physical exercise (व्यायामम्), sexual intercourse (व्यवायम्), fasting (अपतर्पणम्), emaciation (अतिकर्षणम्), day-sleep (दिवास्वापम्), keeping late hours at night (रात्रिजागरणम्), grief (शोकम्), fright (भयम्), drive (यानारोहणम्), sitting on hips (उत्कुटकासनम्), excessive massage (एकान्ततः स्नेहादिक्रियाम्), bleeding (शोणितमोक्षणम्), and undue control of natural urgings of the body (अकाले वेगविधारणम्).

From the first month of gestation she should¹ be joyful (प्रहृष्टा), should wear clean garments (शुक्लवस्त्रा), should avoid dreadful sights (दुर्दर्शनम्), smells (दुर्गन्धम्), and painful talk (उद्वेजनीयकथा), long walks (बहिर्निष्क्रमणम्), resorts to cremation grounds (श्मशानाश्रयम्), or solitary retreats, mental excitation, heavy load (भारम्), or loud talk (उच्चैर्भाषादिकम्). She should not indulge in drugs likely to kill the foetus (योनिगर्भं व्यापादयन्ति).

The bed¹ of a pregnant woman should be low (नात्युच्चम्), soft (मृदु), and with cushions (उपाश्रयोपेतम्), perhaps to prevent a fall.

The food¹ should be sweet (मधुप्रायम्), palatable (हृद्य), and well-cooked with appetizing materials (दीपनीयसंस्कृतम्). In addition dietaries suitable for different months of gestation have been described.

The rules of conduct mentioned above leave very little to be added even at present day as will be known from the following.⁶

"Mental condition and the surrounding of a pregnant woman are of importance, as much as they largely influence her physical well-being and hence that of the foetus. A pregnant woman should, as far as possible, be sheltered from all influences which tend to give rise to excitement, annoyance and depression.

Coitus should be entirely forbidden.

The dietary of pregnancy should be simple, ample and nourishing and all indigestible food should be avoided.

Violent exercise of all kinds should be forbidden."

5. PHYSIOLOGY OF LABOUR.

As the time of delivery approaches the parturient woman should be taken to the delivery room (सूतागारं प्रवेशयेत्) under auspicious stars.

Delivery Room¹—

It should be eight cubits by four with an eastern and a northern door to it. This arrangement appears to have been meant to avoid a direct exposure to a draught. The room should have well plastered walls (उपलिप्तमितिम्); necessary accessories should be well-arranged in it (सुविभक्तपरिच्छदम्).

Normally a woman delivers in the ninth or ten month of pregnancy.

Signs of a woman in Labour (उपस्थितप्रसवा)¹—

Loins become lax—as a result of uterine contractions (जातेहि शिथिले कुक्षौ), the fundus of uterus drops down from its proximity to the heart (मुक्ते हृदयवन्धने), there is pain in the perineum (सशूले जघने), and also round about the back and waist (कटीपृष्ठं प्रतिसमन्तात्), there is frequent desire to pass stools and for micturition (मूत्रस्य मत्स्यस्य मुहुः प्रवृत्तिः) and discharge of mucus from the Vulva.

The woman should be laid on her back (उत्तानाम्), with semi-flexed thighs (आभुग्नसक्थीम्) on a soft and spacious bed (मृदुविस्तीर्णे शयने) and given some nourishment.

Old and experienced female accoucheurs with nails trimmed off should be asked to conduct the labour.

The Vulva and the genital canal should be well lubricated with oil in the direction of the pubic hair and the nurse should encouragingly ask the parturient woman "to bear down but not when there are no pains (प्रवाहस्व न चाप्राप्तावीप्रवाहस्व)¹." The force of bearing down should gradually increase with pains and in proportion as the foetal head approaches the lower end of genital canal provided there is no obstruction. She should continue doing so till the foetus with the placenta is out (अपरात्यहितो गर्भो यावत्पतति भूतले)¹. The foetus lies in the uterus in a doubled up position with its head

covered by membranes (जरायुणावृतो) facing the exit (अभिमुखम्) and at the time of delivery normally presents by the head, (स योनिं शिरसा याति स्वभावात्). The presenting part passing through the vulva is born.

As soon as the child is born it should be cleaned off its slipperiness (उत्त्रं) and the umbilical cord tied four fingers² from the navel by means of thread and cut. The cord should not be tied until the child is well-refreshed (स्वस्थीभूतस्य).²

There is no special mention of delivery of placenta in a normal case but the signs and treatment of retained placenta have been referred to in the Pathology of pregnancy.

6. PHYSIOLOGY OF PUERPERIUM.

Puerperium extends for six weeks after delivery or till menstruation reappears (प्रसूतासार्धमासान्ते दृष्टे वा पुनरर्तवे).¹

After delivery¹, a woman should take to wholesome diet and recreation (युक्तमाहारं विहारं च), avoid exertion (व्यायामम्), coitus (मिश्रितम्), excitation (क्रोधम्), and exposure to cold (शीतसेवा). She should be clean and should have nutritious and moderate diet. Her diet must be controlled and medicines given as long as the lochia is foul (आदुष्टशोणितान्). On the 10th day she should be shifted from the delivery room (कारयेन् मृत्तिकोत्थानम्) and the rites of naming the child etc. observed.

The Infant—

After the umbilical cord is cut the infant should be sprinkled over with cold water (शीताभिरद्भिराश्वास्य)-perhaps to stimulate the respiratory centre—and cleaned off Vernis Caseosa. A pad of cloth soaked in oil should be applied to the umbilicus as well as to the fontanelles. A medicated bath is given. A little ghee and honey is given perhaps as nutrition and also as a mild laxative. The infant should be made to vomit any amniotic fluid (गर्भांशु) it might have drunk by giving ghee and Rock salt (सैधव). The bed² should be clean, soft and without creases (निर्वलीनि) and fumigated by medicines. The child should be wrapped in silk and placed on a bed covered with silk-sheet (क्षौमवस्त्रपरिवृतं क्षौमवस्त्रास्तृतायां शय्यायां).²

Lactation is established on the third day of delivery (तृतीयेऽह्नि चतुर्थे वा स्त्रीणां स्तन्यं प्रवर्तते). This is a reflex action¹ resembling the autoerotic phenomenon in the male produced either by sight, touch, suckling or even by memory of the child. Maternal

affection is the essential factor in the establishment of lactation. Till the lactation is established the infant should be fed on medicated honey and clarified butter. Mother's milk alone is nutritious for the bodily development of the child (मातुरेव पिबेत्स्तन्यं तत्परं देहवृद्धये).

Causes¹ of scanty maternal milk are—

Disaffection towards the child (अवात्सल्यात्), fear (भयात्), sorrow (शोकात्), anger (क्रोधात्), starvation (अत्यपतर्पणात्) and pregnancy (गर्भान्तरविधारणात्).

In the interest of the infant, it should not be fed on the milk of a mother who is taking unwholesome diet, voracious, insane and pregnant (क्षीरं रोगकरं शिशोः).

If as a result of scanty maternal milk it becomes necessary to engage a wet nurse (उपमातृ); the selection should be made with great care (सुविचार्यगुणान्दोषान्). She¹ should be from the same caste (सवर्णा); middle-aged (मध्यवयसा); healthy (अरोगा); of good character (शीलवती); steady (अचपला); contented (अलोलुपा); neither thin nor corpulent (अकृशामस्थूलाप्); with healthy milk (प्रसन्नक्षीरा). She should not have pendulent and flabby breasts (लंबोन्नतपयोधरा)—perhaps for fear of suffocating the child. She should have her baby (सवत्सा) and should be affectionate. She should not be fatigued (श्रान्ता); voracious (भुधार्ता); or miserable (शोकाकुला). This is because nervous impressions have a decided and immediate effect on the milk. An infant who takes milk under these circumstances may show signs of acute indigestion, great prostration, toxic symptoms and even convulsions⁶.

Essentials of a wet nurse given in a modern text book⁶ of Midwifery are as follows—

- “(1) She must be healthy and free from diseases etc.
- (2) She must be between 20 & 35 years of age.
- (4) Her breasts must be firm, with well-shaped nipples, and contain abundance of milk.
- (4) Her own infant must be about the same age etc.
- (5) Her character must be sufficiently good to allow her to be brought in the patient's home.”

Before taking the baby to the breast, the nipple should be washed off and a little of the milk squeezed away. Note in Jellett “Nipples should be washed with a little water immediately before feeding.”

The child should be gradually weaned after the teeth begin to appear (जातदशनं क्रमेणापनयेत् स्तनात्).¹

7. PATHOLOGY OF PREGNANCY.

Abortions, miscarriages etc.

Premature expulsion of the products of conception may occur at any stage of development. Upto the fourth month, expulsion is effected in a form not recognizable from the bleeding which accompanies it, as the products are still in a semi-fluid condition. Hence it is called flowing out of the foetus (गर्भस्त्रावः)¹ which is analogous to Abortion.

In the fifth and sixth months when the foetus is further developed, its expulsion is called falling of the foetus (गर्भपातम्)¹ analogous to miscarriage. (Partus Immaturus).

In abnormal cases delivery may be delayed and may not take place upto the tenth month (Partus Serotinus) (एकादशे द्वादशे वा ततोऽन्यत्र विकारतः).

Causes of Abortion :—

Fright (भयं), blow (अभिघातः), hot and pungent things (तीक्ष्णोष्णपानाशननिषेवणान्), intercourse during pregnancy (ग्राम्यधर्मः), long walks, emetics (वमन) and purgatives (विरेचन) unduly bearing down (कुप्यन), fever (ज्वर), starvation (उपवास) fall (उत्पतन) etc.

Signs of Abortion² :—

Bleeding appears accompanied by pain (रक्तस्य सशूलं दर्शनं भवेत्).

Following are the symptoms¹ after abortion :—

Pain in the loins and back (शूलं च पार्श्वयोः पृष्ठरुक्), burning sensation (अनाहः), excessive discharge of blood (प्रदरः), and retention of urine (मूत्रसङ्गः).

Causes³ of pregnancy which ends fatally :—

1. Contraction of the cervix (योनिस्वर्णम्).
2. Foetus obstructing in the loins (सङ्गः कुक्षौ).
3. Pain in the head, heart and, bladder (मकलः).

The first may be compared to the Placenta Prævia as it delays cervical dilatation for a long time. This has been described as a death-like disease (अतिक्रप्रतिभं) which kills both the foetus and its mother. A doctor is advised not to interfere in such cases (नारभेत चिकित्सितुम्). The second may be due to either rupture of the uterus or of an ectopic pregnancy resulting in the discharge of the foetus in the peritoneal cavity.

For मकल there is no analogous known condition except perhaps Eclampsia in which headache and urinary symptoms are prominent.

Intrauterine death of the foetus (अन्तर्मुतशिशुः)³.

It may result from maternal mental and physical disturbances or to diseased condition of the foetus (व्याधिभिश्च निपीडितः).

Signs of Intra-uterine death of the foetus³ :—

1. Disappearance of the foetal movements and labour pains (गर्भस्पर्शान्दन्मावीनां प्रणशः).

2. Paleness and darkening (श्याम पाण्डुता).

3. Fœtor of breath (उच्छ्वासपूतित्वम्).

4. Distension of the abdomen (शूनता).

A dead foetus should by no means be allowed to remain in the uterus of the mother (नोपेक्षत मृतं गर्भं मुहूर्तमपि पण्डितः).

A tumour called "blood tumour" (रक्तगुल्मः) develops in a recently delivered or aborted woman. It is moveable as a whole but shows no movements as those of foetal parts. It causes pain and simulates pregnancy. (सर्गर्भलिङ्गः)³.

It should not be treated before the tenth month of pregnancy is over. (मासे व्यतीते दशमे चिकित्स्यः)³. The warning is probably given to avoid infanticide which might result from a mistaken diagnosis.

Intra-uterine tumours which simulate pregnancy clinically are intra-mural fibroid and hydatidiform Mole. Fibroid more commonly occurs in sterile women while hydatidiform Mole in multiparæ. Intra-mural fibroid will cause excessive bleeding. Chorion-epithelioma which is of a very destructive nature is beyond question in view of the warning given to wait till the tenth month is over. Ovarian Cyst being extra-uterine need not be considered. Hence Hydatidiform Mole may be taken as analogous to the 'Raktagulma' mentioned here.

8. PATHOLOGY OF LABOUR.

The dislodged foetus when not expelled normally becomes obstructed in the parturient canal.

Signs² of irremediable obstructed labour when the lives of foetus and mother are in danger are :—

1. Inability to balance her head on her shoulders (अपविद्धशिराः).
2. Coldness of limbs. (शीताङ्गी).
3. Loss of sense of shame. (निरपभया).
4. Cyanosis and prominence of veins. (नीलोद्गतसिरा).

The delivery in obstructed labour should be entrusted only to an experienced and skilful accoucheur.

Signs & symptoms of Retained Placenta¹ :—

Pain (शूलम्), Distension (आध्मानम्), and loss of appetite (अग्निमन्दता).

After failure of medicinal treatment of retained placenta, a modified uterine douche is recommended (उत्तरवस्ति दध्यात्). Manual removal is advised as a last measure (अपरां तेन हस्तेन जनयित्री विनिर्हरेत्).

Abnormal presentations (मूढगर्भः) :—

If an abnormal presentation is diagnosed early, it should as far as possible be converted into a normal one (प्रतिलाममनुलामयेत्)¹.

There are four main types of abnormal presentations¹.

1. In Kilah (कीलः) type the hands, legs and head are above the brim while the back is engaged like a wedge (कीलश्च) in the parturient canal. (ऊर्ध्वबाहुचरणैः शिरसा मङ्गलभवति)³.

2. In Pratikhur (प्रतिगुर) type hands, feet and head are engaged while the body is impacted above (निः सृतहस्तपाद शिराः कायसङ्गी).

3. In Veejak (वीजक) type, a single hand presents with the head (एकशिराभुजः निर्गच्छति).

4. In Parigha (परिघ) type, the foetus lies transversely obstructing like a bolt (परिघश्च).

Nos. (1), & (4) are varieties which may be included in the transverse presentation. Nos. (2) and (3) are types of Compound Presentation.

Eight more types of presentations are described¹ :—

(1) By both the thighs (द्वाभ्यां सक्थिभ्याम्).

(2) By one thigh the other being flexed (आभुग्नैकसक्थिरेकेन).

(3) By oblique breech with flexion of both legs and bending of the body. (आभुग्नसक्थिशरीरः स्विग्देशेन तिर्यक्).

(4) By chest, sides or back (उरः पृष्ठ पार्श्वानामन्यतमेन).

(5) By single hand with head displaced to one side (अन्तर्पार्श्वपवृत्तशिरा एकबाहुना).

(6) By both hands with the head flexed (आभुग्नशिरा बाहुद्वयेन).

(7) By hand, legs and head with the body flexed (आभुग्नमध्यो हस्तपादशिराभिः).

(8) By one leg the other being obstructed at the exit (एकेन सक्थिना योनिमुखमभि प्रतिपद्यतेऽपरेण पायुम्).

Treatment—Delivery in obstructed labour is difficult because it shall have to be effected in extreme cases by manipulations inside the uterus. All manipulations¹ like lifting up (उत्कर्षण), extraction (अपार्कर्षण), version (स्थानापवर्तन), incising, cutting and sectioning (उत्कर्तन, भेदन, च्छेदन), pressure (पीडन), straightening (ऋजूकरण) and cutting open (the abdomen) are dangerous. Hence the king should be informed and the above manipulations should be undertaken with greatest precautions.

As long as the child is alive (जीवति तु गर्भे) every attempt should be made to it deliver as such.

If the foetus is dead, it should be extracted as soon as possible (नोपेक्षेतामृतं गर्भं).

The methods of delivering a child with abnormal presentations have been described. If it is not possible to deliver the child by any of these manipulations, application of instruments should be thought of (एवमशक्ये शस्त्रमवचारेयत्)¹. Embryotomy should not be thought of as long as the child is alive. (सचेतनञ्च शस्त्रेण न कथञ्चन दारेयत्)¹.

Surgical interference should be undertaken only by an experienced and skilful female accoucheur with her finger nails clipped, who is bold and expert in the theory and practice of surgery and also light-handed (शस्त्रशास्त्रार्थविदुषी, लघुहस्ता भयोञ्जिता).

After encouraging the woman, the head of the child should be perforated (शिरोविदार्य) by instrument, named मण्डलाग्र or अङ्गुलीशस्त्र, and after taking out the pieces of skull bones (शिरः कपालान्याहृत्य), the foetus should be extracted by pulling with a Shanku (शङ्कुना), forceps on chest or shoulder (उरसि कक्षायांवा). If the head is not perforated, extraction should be effected by applying traction by finger inside the cheek (गण्डे) or eye-socket (अक्षिकूटे). If the shoulders are impacted, they should be cut at the junction with the body and the child extracted (असदेशे बाहुं छित्वा). If the breech is impacted, the hip bones should be cut and delivery effected. If the abdomen is bloated, it should be perforated and intestines removed. (निरस्यान्त्राणि). In short, the woman should be saved by any means, by cutting whatever part of the foetus is found causing obstruction (यद्यदङ्गहि गर्भस्य तस्यस्वजाति तद्विषज् । सम्यग्विनिहरेच्छित्वा रक्षेत्री-ञ्च यत्नतः)¹.

That Caesarean Section was practised in ancient days may be known from the following⁵ :—

If the foetus is alive in a woman who is in a deplorable condition like that of a goat (वस्तमार विपन्नायाः) at the full term of her pregnancy, the surgeon should cut open and extract the child!

(पाटयित्वोद्धरेत्), without delay. Here the comparison of the distressed woman to a goat suggests probably cramps and convulsions as in Eclampsia. Thus it appears that Caesarean Section was advised for Eclampsia in old days.

There is a dispute about the meaning of the word विपन्ना. Properly speaking it means a distressed woman and not as Dallan recommends "a woman who is dead."⁵

Twins—They were believed to be caused by splitting up of the seed (बीजेऽन्तर्वायुनाभिन्ने).

Monsters or deformed foetuses (विकृताकृतयः).

Variety of monsters resembling a serpent, scorpion, gourd etc., have been described. Deformities of foetus like haunch back, nasal voice—probably due to cleft palate etc. are also described.

These abnormalities are ascribed¹ to deadly sins of parents, non-fulfilment of maternal longings during gestation (दाहदेऽवमानिते) or deranged Doshas (वातादीनां कोपेन).

A boneless jelly (कलल) has been described as developing in the uterus of a woman. This grows month by month like pregnancy.

9. PATHOLOGY OF PUERPERIUM.

The following are described as the etiological factors in the causation of Puerperal diseases³—

Misdirected remedies (मिथ्यापचारात्), great distress probably during delivery (संक्रेशात्), unwholesome dieting (विषमभोजनात्), and indigestion (अजीर्ण).

The puerperal diseases are described as very formidable and curable only with great difficulty.

Symptoms of Puerperal diseases—

Malaise (अङ्गमर्दः), fever (ज्वरः), rigor (कम्पः), thirst (पिपासा) heaviness of limbs (गुरुगात्रता), anasarca (शोथः), pain (शूल), and diarrhoea (अतिसारः).

There is a disease like मकलशूल, which is said to affect a woman after delivery. It consists of pain in the head, heart and bladder (स्ताया हृच्छिरांश्चिशूलं)³. It has been described elsewhere. मकलसंज्ञकम्).

Breast abscesses during puerperium have also received attention.

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BACILLUS COLI INFECTION OF URINARY TRACT AND UTERUS

BY

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PART I.

In children, B. Coli infection of the urinary tract causes rise of temperature up to 102° to 103° F; therefore in all obscure cases of pyrexia in children the urine should always be examined for B. Coli infection. To the naked eye the urine is opalescent, and on shaking gives a shimmering appearance as if shoals of very minute fishes are floating in the fluid. Albumen is present from a trace to 0.01% to 0.02%, and microscopically leucocytes are found present either few or in a fair number and coliform bacilli present from few to large number. The pyrexia is due to the B. Coli infection and not due to the leucocytes which may only be few in number.

Having excluded malaria and other causes of fever, in children the urine should always be examined for B. Coli infection, as it is very often the cause of the pyrexia. In children especially in girls it may be an ascending infection, as the female urethra is short and closer to the anus.

In all other cases, in children and the adults the infection is transparietal and we get a history of obstinate constipation, diarrhoea, dysentery and in some cases a history of severe attack of Enteric Fever.

Treatment :—In pyrexia of children due to B. Coli infection of urinary tract, Sodii Bicarb and Potassium Citrate given orally in large doses so as to make the urine alkaline, reduces the temperature and brings it down to normal in a few days, and all other symptoms as fretfulness, wakefulness, loss of appetite etc. disappear. Later on mild urinary antiseptics may be administered.

In adults B. Coli infection in some cases causes a continuous pyrexia, which is sometimes not brought down by administration of alkalies, urinary antiseptics, intravenous injections of Urotropin, but is cured by auto-vaccines. I have seen cases in my practice and that of other physicians for whom I have prepared auto-vaccines for the continuous fever to yield and B. Coli to nearly disappear from the urine on subcutaneous injections of B. Coli vaccine. In some cases a second series of auto-vaccine injections are required to remove the pus cells and B. Coli from the urine, though the fever subsides after the first series of injections. Urotropin caprokol and other urinary antiseptics diminish the number of the pus cells and B. Coli, but do not eradicate the disease as well, as when they are given with B. Coli auto-vaccine injections at the same time.

Symptoms:—The patient is anæmic and emaciated (in some cases to a degree that tubercle of lung may be suspected) has poor appetite and is much constipated. Pulse is weak and heart sounds are feeble. The mental symptoms consist of those of delusional insanity. This condition I have noted all in females but it is very likely to occur in males. In these cases of B. Coli toxæmia a history of previous attacks of dysentery is obtained. The patient thinks that poison is put in her food by servants or relatives, her husband is her enemy that relatives in the house or other patients in the hospitals are speaking ill about her and disturbing her in her sleep. She takes medicines and nourishment after a good deal of coaxing. She talks a good deal to herself and uses violent language to her supposed enemies. Day by day she gets thinner from lack of nutrition due to lessened amount of nourishment taken owing to loss of appetite, suspicion of poison in the food and from restlessness and insomnia. This state continues for months, the patient getting weaker and weaker, later on she becomes delirious and then unconscious for a few days, before death supervenes.

The patient is treated as a mental case, the attention of the physician being engaged by the mental symptoms, insomnia, indigestion, weak condition of heart, lack of nutrition and emaciation and not at all to the urinary infection or if directed to the latter it may be considered of secondary importance. In these chronic cases besides B. Coli, streptococci and staphylococci may also be found. In chronic cases pus cells are present in large number and albumen present from 0.01% to 0.04% or more.

Treatment:—The patient should be kept in a separate room with a sympathising nurse in attendance, to whom she willingly obeys. Liquid nourishing diet should be given at first, which may be gradually increased to solid diet as her appetite and condition improve; hypnotics to be given to produce sleep and quiet the wavering mind. The chief attention should be paid to the cause, the bacterial infection of the urinary tract and in some cases, of the uterus. Urinary antiseptics as Hexamine, Caprokol and Neotropin may be given. The latter has proved more successful. B. Coli auto-genous vaccine be given, if it alone is the infecting agent or it may be combined with the other bacteria if it is a mixed infection. Here also auto-vaccine is of prime importance. Maniacal symptoms occurring during Typhoid fever and post typhoid symptoms of delusional insanity are due to B. Coli infection of the urinary tract alone or in conjunction with *Bacillus Typhosus*. In these cases symptoms during the attack of typhoid fever are of an acute nature with muttering delirium, in post-typhoid period the symptoms are of chronic type of delusional insanity, alternating with maniacal symptoms. These symptoms are

markedly improved by giving B. Coli vaccine or combined Coli-Typhoid vaccine and internal administration of urinary antiseptics. Urinary antiseptics alone have not the power in any of the above grave cases to check the symptoms but it is the use of auto-vaccine that puts an end to the toxæmia and saves the life and mind of the patient. For uterine infection with B. Coli, auto-vaccine is the only remedy available as urinary antiseptics are of no use at all. I am supported in my above conclusions, by a few cases of menopausal insanity cited by Sir Patrick Morchead and Dr. Fitzgibbons recently in the British Medical Journal in which the cases considered hopeless as to mental recovery by distinguished alienists, were cured by hysterectomy done to remove the uterine infection. Auto-vaccine or stock trivalent vaccine tried before performing hysterectomy might have been successful. The cases cited by Dr. Fitzgibbons and Sir Patrick Morehead of Menopausal insanity, lend support to my conclusions of puerperal insanity, chronic delusional insanity and post typhoid and some other forms of insanity caused by B. Coli infection of urinary tract and in some cases of uterus.

It takes a very long time for urinary antiseptics to diminish the number of bacteria in the urine and they cannot antagonise the toxin formed, but within a few days the auto-vaccine forms the antibodies, checks the toxæmia, clears the mental symptoms and helps the destruction of bacteria to a marked extent.

It is therefore highly essential that cases of puerperal toxæmia, puerperal insanity, chronic delusional insanity and acute or chronic mental symptoms arising during or after an attack of typhoid fever be thoroughly examined for B. Coli and other bacteria and energetically treated from the commencement with B. Coli auto-vaccine.

It should be a routine practice in all the asylums to examine all the patients for B. Coli infection of the urinary tract and uterus and if found, treated with auto-vaccines. I am sure many cases of delusional and other types of insanity will show the presence of B. Coli and auto-vaccine is sure to benefit them and save them from dementia.

Dr. Robertson of Edinburgh had cultivated Diphtheroids from the brain of some of the asylum patients and he attributed the degeneration of the brain cells to the toxin of the Diphtheroids. His research was not confirmed, but to me it appears and the result of treatment confirms, that toxæmia of B. Coli infection of urinary tract in most cases, and uterine infection in some cases, is very powerful in causing degeneration of the brain cells, and if this degeneration goes on for a long time the condition of cells, goes beyond repair.

Delay in vaccine treatment is dangerous because the toxin produced by B. Coli acts continuously and powerfully not only on the brain cells but being a protoplasmic poison rapidly lowers the general and cardiac nutrition, and causes early death by circulatory failure. In chronic cases the absorption of the toxin, being slow the lowering of the general and cardiac nutrition, and brain cell degeneration is slower but certain unless auto-vaccine treatment is resorted to in time.

Cases and Comments.

RUPTURE OF THE UTERUS WITH PROTRUSION OF INTESTINES

By

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PENETRATING wounds of the abdomen are fairly common; but penetrating wounds of the uterus with protrusion of intestines into the vagina must be a very rare occurrence indeed. I believe that no such case has been recorded; and the extreme rarity of such a condition is my only excuse to place the following case on record.

HISTORY OF THE CASE.

Patient R. is an Anglo-Indian lady of about 30 years, residing in Kolar Gold Fields. She is a married woman, and has two children living. She has had three difficult labours. The first one ended in a craniotomy, the second was a difficult forceps case, and the child is living; and the third one was also a difficult forceps case with severe post-partum hæmorrhage and with adherent placenta which required manual removal. The child however, is living and is 10 months old.

Patient says she was two months pregnant and took several drugs to induce abortion as she did not want to risk another difficult parturition. These drugs did not have the desired effect. Finally she took a very large dose of quinine and sat in a hot bath; and she soon noticed some bleeding from the Vagina and something coming out. As she was feeling funny and giddy, she took the first available train to Bangalore and came to the Maternity Hospital a distance of about 60 miles and was admitted on 26th September 1930.

CONDITION ON ADMISSION.

Patient was a sparely built but otherwise healthy woman. Her pulse was quick and of poor volume. She was in a state of



The illustration shows only one half of the gut removed. A is the empty peritoneal coat of the gut. B is the attached mesentery. C is the gut denuded of its peritoneal coat.

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collapse with cold and clammy sweats. The abdomen was quite flat and somewhat retracted; and there was some tenderness in the supra-pubic region. The vagina contained coils of intestines denuded of their peritoneal covering, a large mass of which was easily extracted out of the vagina. On introducing a speculum, it was clear that the intestines were protruding from the cervix.

OPERATION.

After administering intravenous saline and an injection of pituitrin, the patient was given a general anaesthetic: and the abdomen opened in the middle line, below the umbilicus. The uterus was brought out and examined. There was a tear in the anterior wall of the uterus, capable of admitting two fingers and through this, the small intestine was found to have escaped, leaving the peritoneal coat behind like a cuff. For about twelve inches above this point, the entering and returning loops of gut were found to be intensely congested and purple in colour. The loops were cut about an inch above the area of congestion, and the ends sutured; and after removing the empty tube of peritoneum together with a mass of congested mesentery a lateral anastomosis was done. Meanwhile, the mass of intestines denuded of peritoneal covering was easily pulled out from the vagina by an assistant. The tear in the uterus was carefully sutured; and the abdomen closed.

SUBSEQUENT HISTORY.

Four days after the operation, the patient got diarrhoea; and she was in rather a serious condition with attacks of diarrhoea, vomiting and slight jaundice. The diarrhoea was brought under control by the administration of Bismuth, and the patient began to show signs of improvement from the 7th October, i.e., 10 days after the operation. The operation wound unfortunately suppurated, but finally healed up about six weeks after the operation, the patient being discharged cured on 26th November 1930. She was seen again two months after discharge, and was found to have recovered completely and attending to her usual work.

COMMENT.

There are some points of interest in the case:

(1) Evidently, the history given by the patient is not true.

The only possible explanation is that some one possessing a slight knowledge of midwifery must have introduced a sound or a curette into the uterus, and scraped the soft uterine wall. Possibly the adherent placenta at the previous child-birth had damaged and thinned out the anterior wall of the uterus; and hence perforation

was made easy. I believe that even the intestine was scraped after penetrating through the uterine wall. When a loop of gut denuded of peritoneal coat presented, it must have been tugged upon, probably mistaking it for some part of the ovum. How the patient bore all this trauma is a matter for wonder.

(2) The gut removed *per vaginam* was 8 feet in length, and looked like a piece of rope, without the usual puckered appearance. This is, of course, without the peritoneal coat. It corresponds to about half the length of normal intestines with all the three coats *in situ*, making allowances for the valvulae conniventes. The portion of intestine with all its coverings removed from the abdomen was found to be two feet in length.

(3) The onset of diarrhoea was evidently due to the loss of such a large absorbing area; and the remarkable adaptability of the human system is responsible for the recovery from such severe diarrhoea threatening the life of the patient.

(4) That the peritoneum, though delicate in structure, has wonderful powers of resistance and recuperation is well exemplified by this case.

My thanks are due to Dr. (Miss) M. C. Albuquerque for giving me the opportunity of handling this case, and for so ably assisting me at the operation.

THREE CLINICAL CASES OF MALFORMATIONS AND ABNORMALITIES IN THE NEW BORN CHILD.

By

R. C. SRIVASTAVA B. SC. M.B., B.S., ROORKEE.

Case No. I.—I was called one evening to attend a case of Haematuria in a new born child 6 days old. On examination, I found that the blood was seen to flow for a few seconds every half an hour irrespective of the fact whether the child passed urine or not. This led me to think that the blood was not coming from the urethra but from somewhere else. On investigation I found that the blood was coming from the vagina and not from the urethra and another interesting fact was that her breasts were swollen and on pressure some secretion could be obtained from them. Hazeline Liquid was given in three minim doses every two hour and three doses were quite sufficient to stop the bleeding. Three days later the same symptoms developed again and the same treatment was started; Hazeline Liquid was continued this time for about a week. Since then these symptoms have not appeared again though the child is about one and a half year old.

Case No. II.—A child five days old was brought to me with the complaint that he is unable to suck the breasts of his mother. On examination of the buccal cavity I found that there was a protuberant growth about $\frac{1}{2}$ " from the gums in the lower jaw. On palpation I found that the growth was bony hard in nature. I took it for one of the growths connected with the mandible. The child was put on artificial feeding and I kept him under observation for about a week when it was noticed that a tooth was making its appearance from underneath. The gum was duly incised and later the tooth was extracted.

Case No. III.—I was called one evening to see a new born child who was supposed to have no anal orifice. I examined the child very carefully and I could not trace even the depression representing the anal orifice. I advised the patient to be removed to King George's Medical College Hospital Lucknow as an operative interference may be necessary but next day I was called again when the patient was passing faeces through the vagina. On careful examination I diagnosed the case as of vulval anus and the bowels opened just behind the hymen representing the persistence of cloaca.

Malformations though with few exceptions are rare yet, when present they may have serious consequences to health of mind and body; they call for skill in diagnosis and treatment and have an additional importance because they may give rise to difficult social and medico-legal problems at puberty and marriage. The interest of the above cases lies in the fact that though such cases are mentioned in text books yet one rarely comes across them in actual practice.

A SEVERE CASE OF ECLAMPSIA, SUCCESSFULLY TREATED WITH MAG. SULPH. AND STOMACH LAVAGE.

By

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THE only justification for its publication is the severity of the case with the happy result of a dramatic recovery from this "very dangerous complication of Midwifery." More-over it was one of the rarest cases of Eclampsia coming during the puerperium, the most common time being before or during labour.

Vidya Devi, aged 23 years, gave birth to a son at 11 A. M. on 21-7-1931, and developed symptoms of Eclampsia at 4 A. M. on 22-7-31. The delivery was quick and un-eventful having taken less than 2 hours.

Previous History:—It was the third pregnancy. The previous labours had no complications. There was no history of malaria or jaundice. Urine was not examined for albumin or casts during pregnancy. Of the predisposing causes she had puffiness of face, oedema of legs and feet and slight occasional pain in the pit of the stomach which was never so severe as to require energetic treatment. Costiveness with retention of fecal matter and consequent overloading of bowels had perhaps much to do in the matter.

Symptoms:—(a) *Prodromal:*—

1. Puffiness of face.
2. Both suppression and retention of urine.
3. Oedema of legs and feet, pitting on pressure.
4. Epigastric pain of a mild type.
5. Headache.
6. Vomiting.
7. Foul tongue.
8. Constipation.
9. Albuminuria.

(b) *Actual Symptoms:*—Convulsions started at 4 A. M. on 22-7-31 and I was called at 11 A. M. when she was in a condition of deep coma. She looked exhausted, there was uraemic smell about her, and her face was puffy and swollen. In the preliminary stage, the eyelids twitched vigorously. Then came the toxic stage with lock jaw, horrible twisting of arms and body in spasmodic contraction, along with suspension of breathing. The clonic stage soon followed with vigorous shaking of the whole body, slow return of respiration, and passing to deep coma. The 1st two stages lasted from 1 to 2 minutes each. The coma gradually increased for a few minutes to the entire interval between the fits, till she was unconscious throughout during intervals. The fits came every 4 hours at first, but gradually became more frequent till they came every $\frac{1}{2}$ hour. From 11 A. M. on 22-7-31 to 5 P. M. on 23-7-31 she was in a continuous stage of coma with intervening fits, each leaving her more exhausted and cyanosed than before. Fits were so severe at times towards the evening, that it was each time feared she would never survive the present one. As she progressed towards recovery the fits gradually lessened in frequency and severity, but she never regained consciousness until 5 P. M. next evening. Total number of fits during 24 hours must have been more than a dozen.

Pulse was full, rapid, and bounding. Blood pressure was high, between 160 and 200 M. M. Temperature between 102° and 104° F.

PROGYNON

(Left) Genital organs and section of uterus of control animal

(Right) Genital organs and transverse section of uterus of infantile monkey treated with Progynon dragées

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4. Urine had to be drawn with a cathetar once or twice, and dry cupping and hot poultices were applied to the back to promote its secretion.
5. Tongue was kept back with a spoon to prevent biting during the fits.
6. Hyoscine gr. 1/100 was given hypodermically.
7. Sleeping draught was given at night and glucose solution in the way of feeding during intervals whenever swallowing was possible.

All these measures brought no relief till 3 P.M. on 23-7-31 when stomach lavage and Mag Sulph. were repeated. This brought on 2 or 3 huge motions with large amount of very offensive fecal matter within an hour's time. This opened her eyes and slowly she regained consciousness by 5 P.M. Her face became normal and without any return of fits, the patient quickly progressed to an uneventful recovery.

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VAGINAL DISCHARGE

BY

FREDERICK H. REYNOLDS, M.B., B.S. (Edin.)

Civil Surgeon, Loinwee, South Shan States, Burma.

VAGINAL Discharge is a subject which is familiar to us in our ordinary practice. It is more a symptom than a disease, but it is a symptom to which particular care and attention are not always given. So I am proposing to discuss it here. In the out-patient department, cases of Vaginal discharges frequently occur, and I have often seen promiscuous advice given for a douche in all cases, without a thorough examination of the parts concerned. Many a patient has come along, been given a douche, and gone away tem-

porily relieved, thinking her complaint cured until such time as some other serious symptoms have supervened. If a thorough examination had been made originally, we might have been able to save a great deal of distress to the patients. All of us are prone to error at some time or the other, but it is up to us to examine cases to the best of our ability.

I have before me a series of cases which have come to me at some time or the other. I am enumerating a few here which may be of interest. I propose to deal here with cases of pure vaginal discharge, apart from discharges which occur as a complication to serious organic diseases of the female reproductive system.

Case 1. A. B. a girl aged 9, was brought to me by her mother greatly distressed. The discharge has been noticed coming from the vaginal orifice on one particular morning on her return from school. There was a slight temperature but this did not disturb the little patient in any way. There were no other symptoms, but on examination bacteriologically I discovered gonococci. The child had got herself contaminated probably through infected towels etc.

Case 2. M. O. aged 22 years was greatly distressed because suddenly one day on return from work, a whitish watery discharge had stained her clothes. She had always been pale and anemic, and at times been incapable of doing her work. No other symptoms. The patient appeared very much run down, and her health had not been too good lately. Apart from the ordinary pyogenic organisms, there were no other. Urine examination did not reveal anything out of the ordinary except that the specific gravity was higher than normal.

Case 3. B. T. aged 8 have had a vaginal discharge. Her bed sheet was found stained. Bacteriological examination did not reveal any gonococci. The patient had suffered from worms and been treated at the local Hospital. Her thighs were red and excoriated with the constant scratching. The discharge had been very persistent. The mother was very much worried, and wanted to know whether a cure could be expected. I took swabs from this case for a vaccine.

Case 4. Mrs. B. O. aged 48 long past the menopause. Had had an operation for a prolapsed womb 4 years ago, but the womb had since come down again, and her previous doctor advised a pessary. She had been wearing one since. The pessary had given her trouble. She was aware that it did not always fit properly. On examination the mucous membrane of her vagina was found red and inflamed and dotted with innumerable reddish spots which bled on the slightest touch. The cervix was inflamed and a discharge oozing out

There was chronic endometritis also. Bacteriological examination showed various organisms including *B. coli*.

I think these four cases will suffice to discuss the subject for this occasion.

It will be seen that a vaginal discharge may occur—

1. In virgins and young children as a result of poor vitality and other depressed conditions apart from any bacillary infections. In children, sometimes due to the irritation of the urine or to worms etc. there may be a vulvo-vaginitis. The thighs are sore and excoriated due to the constant rubbing, scratching and chaffing. The discharge sometimes is of gonococcal origin, and the distress produced in such cases to the mind of the mother is very great. At others no gonococci can be found, and the discharge automatically disappears with suitable treatment. The discharge due to gonococci, may be mucopurulent or purely purulent. In virgins the discharge may be simply pure mucous and occurs after a menstrual period. The discharge in these cases is due to a hyperactivity of the cervical glands.

2. In married women where contraceptives and ill fitting pessaries have been worn. The discharge in these cases is foul smelling due to the various organisms which have flourished in the vagina. There is considerable itching and a burning sensation. The vagina is excoriated and red, and the patients are distracted.

3. In lacerations of the cervix after a protracted delivery, or the discharge may occur months after. The cervix in these cases is torn and deformed and there is much scar tissue. The discharge in these cases is liable to recurrence.

4. In the aged without any obvious cause there may be a vaginal discharge. The patients are long past their menopause. Usually ill fitting pessaries have been worn. The mucous membrane in these cases is bright coloured and dotted with pin head spots of reddish colour which bleed readily on the slightest touch. There is usually chronic endometritis as well.

5. In cases of serious organic diseases. The discharge is very foul and yellow and mucopurulent. These are cases of carcinomas and endometritis of long duration.

6. Lastly it is necessary to bear in mind that a vaginal discharge may be unconsciously introduced by the examining physician either due to his contaminated hands or to his badly sterilised instruments, or to an unclean pessary introduced. Strict sterilisation is therefore essential, and the necessity of impressing this on local Sub-Assistant

Surgeons in out-lying hospitals is one for which the Civil Surgeon is responsible.

In the four cases stated above, it will be seen that in Case 1 the discharge was due to a contamination and gonococci were found. In case 2 the discharge appeared due to depressed vitality. Case 3 the discharge appeared spontaneously, and lastly in case 4 it was due to an ill-fitting pessary. It will often be found that where gonococci are discovered in children with a vaginal discharge, that contamination is effected from one child to another at schools or elsewhere, through the common use of an infected towel or sheet etc. Contamination is easy and it is not always possible for an absolute cleanliness though this is strictly insisted upon.

Before proceeding to the bacteriological examination and treatment perhaps it is wise to revise our knowledge of the glands of the female reproductive system, and how the discharge is brought about.

Commencing with the vagina, we find that its squamous epithelium has no secreting glands, but it is always lubricated by the secretion which flows down it from the uterus and by the fluid which exudes from its walls. The cervical mucosa contains a single layer of glandular epithelium, the glands being racemose in character and opening on the surface in each a single duct. The mucous membrane of the body of the uterus contains tubular glands. The mucous membrane of the Fallopian tubes contains no glands but fluid from the peritoneal cavity passes through them downwards through the uterus.

It will be seen therefore that the fluid emerging from the vagina may be 1. from the peritoneal cavity 2. body of the uterus 3. cervix and 4. fluid exuding from the vagina. The fluid from the endometrium of the uterus is watery, from the cervix is clairy and contains mucus and from the vagina is watery and contains also shed epithelial cells. It may be curdish, and is acid in reaction.

Diagnosis:—In all cases of Vaginal discharge coming for treatment, a smear should be taken on a platinum loop 1. from the vagina and 2. from the cervical canal. In this way the presence or absence of gonococci will be determined on microscopical examination. Care should be taken to get the smear from the right place. The child's thighs should be gently separated. More than one smear should be taken and at various times to thoroughly exclude the gonococci. It is necessary to bear in mind that a purulent discharge in young girls after puberty may be due to tubercular disease of the pelvic organs.

The acidity of the discharge should be tested and noted. On separating the vulva it is sometime possible to see the discharge issuing from the cervix. Palpation of the vaginal canal may reveal a swollen vagina. In pyosalpinx a bimanual examination may produce a stream of creamy pus from the cervix.

The speculum should be introduced and the cervix fully inspected. The condition of the Vagina should be thoroughly inspected.

In all these examinations it is necessary to bear in mind the necessity of a complete sterilization and the possibility of the introduction of bacteria into the cervix.

Sometimes it is possible to see the discharge lying caked at the entrance to the cervix.

Treatment. In treating cases of vaginal discharge, it should be borne in mind that the treatment is not always satisfactory and the discharge is liable to recur. The patient goes away very much relieved. In cases of depressed health, the discharge disappears when the normal health is regained with tonics and other suitable treatment. In these cases the general condition should be toned up with iron and arsenic. In children, the vulva should be thoroughly exposed and gently swabbed with a weak protargol solution—5% solution. Internally a mixture of potassium citrate, a little quinine and a few grains of bismuth should be administered. The swabbing should be done gently. The child should be restrained.

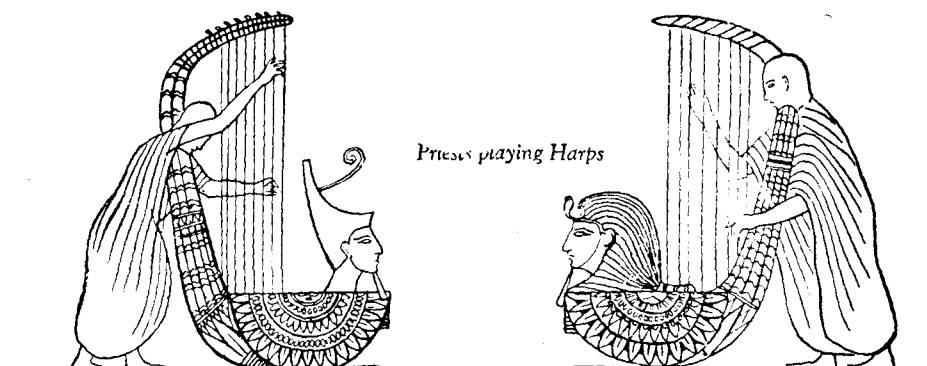
In young virgins where the discharge is chiefly mucus, they should be assured that the discharge will disappear with the increase in tone of the general health, and suitable tonics should be prescribed. If the discharge continues, a thorough examination should be made.

A vaginal discharge due to gonococci is very persistent and very difficult to treat. In married patients where the discharge persists after a usual douche, it will be necessary to dilate the cervical canal. The cervical canal is the most resistant. The cervical canal should be dilated and its mucous membrane swabbed thoroughly with a 10% solution of formalin. The patient should be well anaesthetised. The after treatment should consist of daily douches and a repetition for about three occasions of the swabbing with 10% Formalin. If still persistent, cauterization should be done. In parous women with deformed cervices, palliative treatment is not always successful and operative treatment should be advised. In these cases, treatment for the serious lesions, should be advised.

In women past the menopause, douching with an astringent lotion such as alum two or three times daily, and an insufflation with kaolin have been found beneficial. Tampons of glycerine with boric or tannic acid may be inserted at nights.

Indiscriminate douching in all cases of Vaginal discharge should be discouraged. A douche though cleansing, does not always penetrate to the seat of infection and may be harmful in interfering with the normal secretions of the vagina and thus allowing free access of bacteria. Douching the vagina should therefore not always be carried out. When a douche is recommended, a warm or hot boric acid solution, I find does well. This is followed by an insufflation with kaolin.

In all cases where the discharge persists after treatment on ordinary lines, dilation of the cervix should be carried out and the canal swabbed with a 10% Formalin or 10% silver nitrate. Dilatation of the cervix should be done under an anesthetic.



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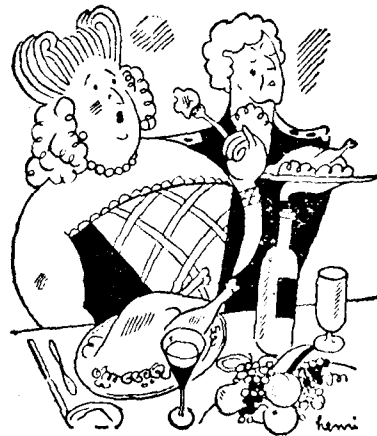
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THE HISTORY OF OBSTETRICS.

It is difficult for us to imagine and visualise the status of the Obstetrical art during the past ages. There is perhaps no other subject in the entire field of medicine which is associated with as much mysticism, fanaticism, tradition and superstition as is Obstetrics. Much of the superstition that is now prevalent among the ignorant has had its origin in the dark ages and has been handed down through generations. It will certainly be interesting to trace the history of Obstetrics from the dark ages to modern days. Think of the days when all modern facilities for the parturient were not available; when the stethoscope, the microscope and the obstetrical forceps were as yet not made; imagine a lying-in case attended only by unqualified quacks and the only operations known then, being of a destructive nature. If you can visualise a combination of all these disabilities, then you could certainly realise the progress made in the Obstetrics of today.

We shall start with the primitive days, of which, however, we have very little historical record. Child-birth has always been accepted among these primitive people as a natural process, and as such was treated with indifference and brutality.

The necessary aid was given by untrained women who were supposed to know intuitively what to do. Labour itself was a normal process due to the fact that the women lived almost always out of doors and to the fact that there was no intermingling of races and even tribes. Labour was supposed to be a voluntary act on the part of the foetus and the character of the labour was presumed to depend on the disposition of the child. So, therefore, any child so

perverse as to cause any change in the normal act of labour, deserved to die, as did a mother who bore such a child. As to labour itself, manual aid was given by pressing on the abdomen from above or by shaking the women. The women were all delivered in a squatting position on the ground and the perineum was protected by sitting on a mound of sand. The third stage of labour was managed by several methods. In some places, the placenta was allowed to be expelled with the foetus intact, and then cut, dried and preserved. In other places the cord was severed as soon as the baby was born and then it was either cut off, bit off, or a string was tied to the cord and the other end of the string attached to the big toe of the patient who by gentle traction pulled out the placenta.

Later, civilization had its effects on child-birth. The Egyptians, Greeks and Romans did much to improve the Obstetrical art, cleanliness was somewhat established by the introduction of the process of washing the genitalia. It was thought that cephalic presentation was the only favourable presentation conducive to the life of both mother and child. Hence cephalic version was practised extensively. Caesarean section was also done but it was limited to post-mortem cases. A dead foetus, at the time was either cut up and delivered or allowed to decay and rot in the uterus, which would, at a later period expel it. The placenta in these days were removed either by pressure, shaking or vomiting. Later on, the obstetrical chair was introduced. This was an ordinary chair with a hole cut out of the seat and before which the midwife would kneel and deliver the patient. Podalic version is also mentioned as being done in these days. Hippocrates, Celsus, Galen, Soranus and Vesalius were among the physicians who contributed at this time to the material advancement of the science of obstetrics. With the decline of the Greek and Roman civilization the care of the women deteriorated and for thirteen centuries while all Europe was in a chaos, no scientific advancement was done, on the other hand, darkness was all prevalent and the teachings of the great men were either lost or ridiculed and replaced by ridiculous fanaticism.

The next great epoch opens with the name of Ambrose Pare the great French surgeon, who, about 1550 rediscovered podalic version. This discovery constituted the first step in the emancipation of the child bearing woman from the exclusive hands of the ignorant midwives where it had rested since the fall of the Roman Empire. Pare opposed Caesarean section and checked its progress for over a century but his objection was due to an ignorance of the anatomy of the Pelvis and a misconception of the mechanism of labour. In Pare's time a school for midwives was opened at Paris and the women who graduated from this school were vastly superior to the bedraggled

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and a flat sliding lock. De Lee at this time modified Simpson forceps by increasing the cephalic curve, so as to produce less lateral pressure. He also made the blades lighter and changed the handles. It is practically impossible to name and describe all the forceps in the market. In fact all obstetricians of note have made slight modifications to forceps in their times and have named the instruments after themselves. Milne-Murray, Barton, Piper, Kedarnath Dass are some of these specialists. The invention of the forceps brought another aid to child bearing woman which was to play a great part in the saving of the lives of children and suffering women. But like all things, whose limitations have not been defined, the use of the forceps, was very much abused in the early stages of its development. Conditions are better now but we would still strike a note of warning and enter our emphatic protest against the indiscriminate use of the forceps.

By the nineteenth century obstetrics was well developed from the mechanical side. Great progress had been made in the art of assisting the child bearing woman during the three hundred years which had passed since Pare had opened the way for the return of the physician to the lying-in room. But some of the advantages derived from the development of obstetrics and the extensive participation of the physicians in the art were offset by the increasing prevalence of a disease known as child-bed fever or puerperal fever, which assumed epidemic form during the seventeenth, eighteenth and nineteenth centuries. Ludwig Ignaz Philipp Semmelweis, a Hungarian physician was the first to find the actual aetiology of this disease. Before his discovery, it was common knowledge in Vienna that of the cases delivered by physicians there was a maternal mortality of about 10%, while of those cases delivered by the midwives there was a maternal mortality of only 3%. Semmelweis undertook to investigate this matter. He noticed that doctors and students often come directly from an autopsy or dissecting room to deliver a baby and following these cases further, he noticed that these were the cases that developed a temperature. He therefore came to the conclusion that puerperal fever was caused by contaminating the external genitalis with decomposed animal matter brought there by the hands of the doctor. He immediately advocated the unheard procedure of insisting on personal cleanliness and insisted that anyone leaving an autopsy or dissecting room to confine a woman should first change his clothes, then scrub his hands and finger nails. In those clinics where these proceedings were carried out, Semmelweis in 1847, showed that the maternal mortality fell considerably below that of the midwives. But his contemporaries ridiculed and despised him. He laboured through a life-time of oppression and persecution and died of its infection. Semmelweis, unsung in the

history of the world, little known to the outside world, even though a statue to him was unveiled in Budapest in 1906, has however the mute testimony of his greatness in every child that is born and in every mother that bears a child in the civilized world. Thanks to Semmelweis and the many other scientific workers that contributed their mite, puerperal infection today is no longer the scourge it was. It is a disease that is preventable. But public opinion has not yet been sufficiently drawn to this very important problem. The attitude of indifference to the child-bearing woman in our country—evident in our high maternal and infantile mortality—is a thing which should never be allowed to continue. It is up to all of us to see that the public at large are educated and that measures are speedily taken to reduce this appalling maternal and infantile mortality.

The use of anæsthetics to alleviate the pain of surgical operations and of childbirth was unknown before the middle of the nineteenth century. No greater boon has ever come to mankind than the power granted to induce a temporary but complete insensibility to pain. So far as surgery is now concerned, the means of inducing anæsthesia are highly developed and extremely effective. Such however, is not the case in childbirth. Certain conditions, partly physiological and partly sociological, have prevented this use of anæsthesia being applied to the same extent as in surgery. The discovery of anæsthesia was first demonstrated with the use of ether in 1846. Among the first in Europe to use chloroform was Dr. James Y. Simpson of Glasgow, who in 1847 published his experiences of chloroform in relieving the suffering of women during childbirth. But he was denounced from the pulpit and by pamphlets on the ground that "the pain of child-bearing was a woman's heritage and her ordained lot and to prevent it was a sacrilege". Simpson, however, never shirked. Within two years he had administered chloroform to over 40,000 to 50,000 persons in Edinburgh. His work was now recognised. He was knighted and unlike Semmelweis lived to see the success of his efforts. But the one event, which more than anything else, added materially to the rapid advancement of anæsthesia during childbirth was the acceptance of Queen Victoria to use chloroform for the delivery of her seventh child, Prince Leopold. The recognition, however, of the occasionally dangerous qualities of chloroform, led to a search for other safer substances. Ether, Nitrous oxide either alone or combined have been tried. Spinal anæsthesia has been attempted but given up. Intravenous Magnesium sulphate and the use of Scopolamine combined with Morphia have all been tried with varying degrees of success. There is every probability that in the near future a nearly painless childbirth will be effected but it must be remember-

ed that for those women, who will not go to hospitals and who have not the means to procure elaborate medical care in their own homes, this prospect of painless child-bearing is not very promising.

The Nineteenth and Twentieth centuries should be regarded as the high renaissance period in the field of obstetrics. Many important problems have been and are being investigated. Eclampsia has been under investigation for over a hundred years. In the early days venesection and application of about 20 leeches was the only treatment done. In the middle of the nineteenth century chloroform was used to stop the convulsions and vaginal douches were given to stimulate uterine contractions. Later, morphia injections were tried. Towards the end of the nineteenth century, Straganoff introduced Morphia injections and chloral per rectum. Later still the preventable aspect of Eclampsia was studied; the albuminuria and blood pressure recognised and careful dietary recommended. Other important problems have been studied and their causation and treatment made clearer. Hyperemesis Gravidarum, Placenta Praevia, Antipartem Haemorrhage, Acute Yellow Atrophy are a few of these diseases, whose mysteries have been unravelled. Podalic version, Caesarean section and the other dreaded operations have now been improved to such an extent, that their mortality rates have become negligible, and their use common in the everyday practice of any modern hospital. To these and to the many other discoveries the modern child bearing woman has to thank the great Obstetricians of the last and this century. Doderlain, W. Williams, Potter, Kielland, Straganoff, Munro-kerr, Berkeley, Bonney, Blair-Bell and Fitz-Gibbon have become house-hold names wherever modern midwifery is practiced.

The child-bearing woman today has less fears during delivery than her predecessor of a few centuries ago. But a lot yet remains to be done. Antenatal work, Post-natal work, maternity and child welfare work, the solving of the economic problem, poverty and consequent ill-health, the removal of the superstitions that time has left amidst us are all problems that are urgent and need our immediate attention. To these, we would exhort the present and future medical men to turn their attention and do their best in the alleviating of human suffering and repairing of a great national loss.

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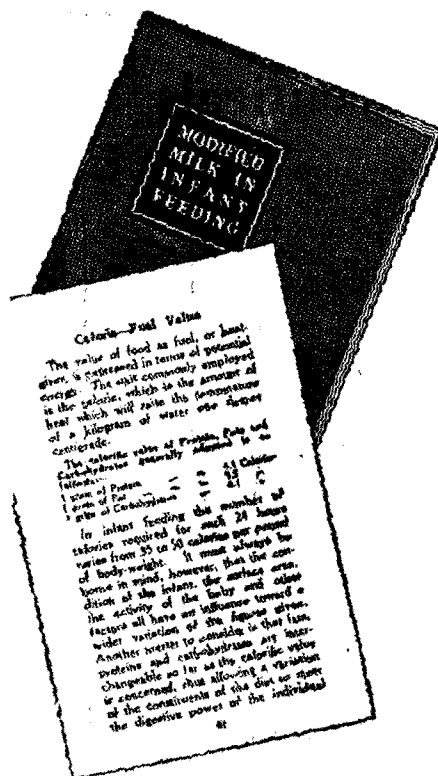
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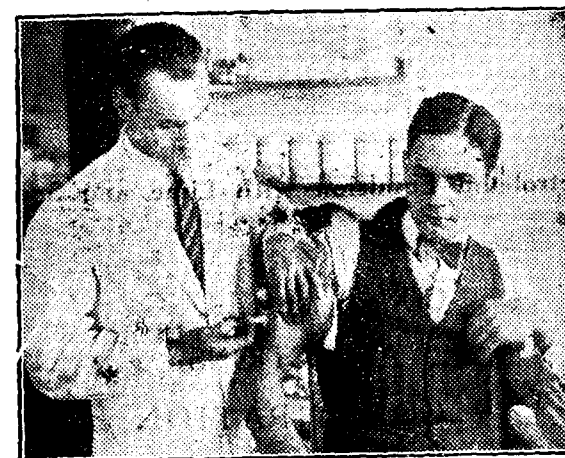
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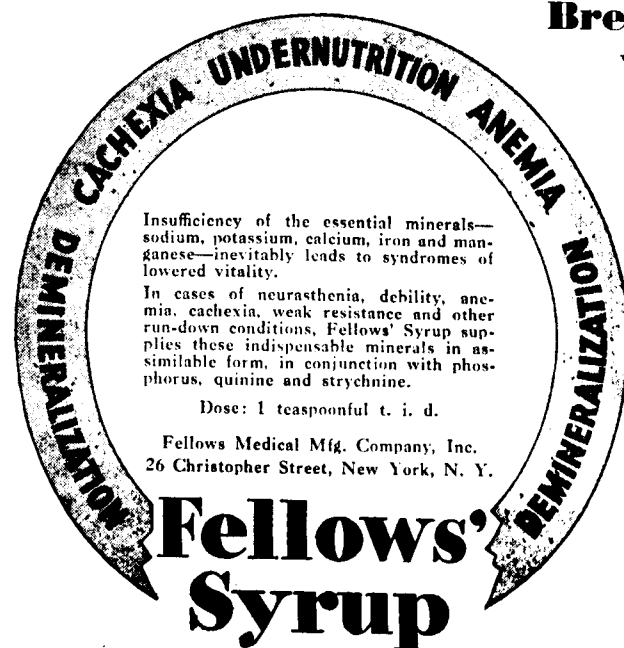
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Original Articles.

ON BILE AND THE BILIARY FUNCTIONS OF THE LIVER.*

BY

K. C. PAUL, M.D.,

Hon. Physician, Government Royapuram Hospital, Madras.

1

Of the numerous functions of the liver, the most obvious is the formation of bile. In the discharge of this function, the liver acts both as a secreting gland and as an excretory organ. (Hence we refer to the bile-forming function in the plural as the *Biliary Functions of the liver*). As a secreting gland, the liver elaborates the bile acids, whose presence in the bile makes this fluid of use in the digestive processes; and as an excretory organ, it removes from the blood the waste products of hæmoglobin metabolism which appear in the bile as bile pigment. Besides these constituents, bile contains small amounts of cholesterol, lecithin, fat, fatty acids and soaps, certain inorganic salts, a nucleo-albumin resembling mucin, and, according to Hammarsten, true mucin. Of these, the mucin and the nucleo-albumin are secreted into the bile by the cells lining the bile ducts; the others come from the hepatic cells, but whether they are secretory or excretory products is not definitely known. As regards cholesterol, Carlson believes that it is partly a secretory and partly an excretory product. Because of the part it plays in the

* Specially contributed to the "Antiseptic."

absorption of fat, lecithin may be regarded as a secreted substance; but physiologists class it, along with fat, fatty acids, soaps, and inorganic salts, among the excreted products. Finally, it may be mentioned that the hepatic cells pass out the biliary constituents in a watery medium, there being from 965 to 985 parts of water in every 1000 parts of (hepatic) bile. But some of these constituents, such as cholesterol, lecithin, fat, fatty acids, and soaps, are insoluble in water. As Moore has pointed out, they are held in solution in the bile by the bile acids. We may note one other fact, namely, that many foreign substances, when introduced into the body, are excreted by the liver in the bile.

2

Bile is, therefore, a highly complex substance, and is partly an excretion and partly a digestive fluid. As an excretion it should be formed continuously, but as a digestive fluid it is required in the intestine only when digestion is going on. "The exigencies of the body," in the words of Starling, ".....require a continuous excretion of bile by the liver, but a discontinuous entry of this fluid into the small intestine. This discontinuity in the entry of a continuous secretion into the intestine is secured, in the majority of animals, by the existence of the gall-bladder, a diverticulum from the bile ducts, in which all bile, secreted during the intervals between the periods of digestive activity, is stored up."

But the bile found in the gall-bladder (gall-bladder bile) differs from that obtained from the hepatic duct (hepatic bile). Hepatic bile, in human beings, is a thin transparent fluid of golden yellow colour; its specific gravity lies between 1.006 and 1.012; and its reaction is alkaline: Neilson and Meyer state that its pH is 8.0. Gall-bladder bile is a highly viscid fluid of greenish-brown colour; its specific gravity lies between 1.026 and 1.035; and its reaction is neutral or faintly alkaline: its pH varies from 7.0 to 7.6.

Occasionally the colour of hepatic bile is greenish, and that of gall-bladder bile deep orange or golden yellow.

The specific gravity of gall-bladder bile may sometimes be 1.040 or even 1.050.

Morse says that, during its stay in the gall-bladder, bile may become even acid in reaction. Drury, McMaster, and Rous have found that in dogs normal hepatic bile, which is alkaline in reaction and has an average pH of 8.20, undergoes in the gall-bladder "a change toward the acid side, becoming on long sojourn there, strongly acid to litmus (pH 5.18 to 6.00)."

According to Neilson and Meyer, drawn bile, on standing, tends to become more alkaline. They have found that bile, if made acid and allowed to stand, becomes alkaline again in a few hours. This

shows that bile is highly buffered so that it may retain its alkalinity under even adverse conditions.

Both hepatic bile and gall-bladder bile are intensely bitter in taste. But the bitterness of gall-bladder bile is more mawkish and disagreeable than that of hepatic bile.

It is interesting to note that, according to Lauder Brunton, the bitter taste of bile is pathological and due to poisons absorbed from the alimentary canal and excreted into the bile ducts. He has stated that *healthy bile is tasteless*. But we know that the bile acids and their salts are intensely bitter substances, and these are present in the bile in quite large amounts.

Hepatic bile and gall-bladder bile differ from one another in their composition also. Gall-bladder bile is richer in solids than hepatic bile; while gall-bladder bile contains large amounts of mucin and nucleo-albumin, hepatic bile contains very little of these. The relative compositions of the two fluids are shown below:—

TABLE I.

1000 parts of bile contain.	from			
	Hepatic duct		Gall-bladder.	
WATER	974.600	964.740	839.80	829.68
SOLIDS	25.400	35.260	160.20	170.32
Mucin and Pigments	5.150	4.290	44.37	41.91
Alkaline Bile Salts	9.040	18.240	87.23	96.97
Glycocholate	6.860	16.161	67.89	69.57
Taurocholate	2.180	2.079	19.34	27.40
Fatty acids and Soaps	1.010	1.360	10.58	11.17
Cholesterol	1.500	1.600	8.70	9.86
Lecithin	0.650	0.574	1.41	2.23
Fat	0.610	0.956	6.50	1.90
Soluble salts	7.250	6.760	3.02	2.88
Insoluble salts	0.210	0.490	2.36	2.22

3

These differences (in characters and composition) suggested to the older observers that during its stay in the gall-bladder, bile became highly concentrated. Saunders, in 1795, observing the rich lymphatic supply of the gall-bladder, surmised that large amounts of water were withdrawn from the bile that entered this viscus. He noted also that the vesical epithelium secreted the 'mucin' present in gall-bladder bile. Kemp, in 1856, showed that gall-bladder bile owed many of its characters to the presence of 'mucin.' The viscosity and the lessened alkalinity of gall-bladder bile are indeed due to the large amount of 'mucin' it contains. (Paijkull, in 1877, showed that this mucin was a *mucoid nucleo-albumin* and not *true mucin*). Brand, in 1902, from a careful study of the differences in composition

between fistula bile and gall-bladder bile, came to the conclusion that hepatic bile lost, during its stay in the gall-bladder, not only a great amount of water, but also most of the soluble inorganic salts. And Holhweg, in 1912, from similar comparative studies, found that the 40 cm. of bile found in a human gall-bladder of average size represented between 240 and 400 c. cm. of hepatic bile.

These surmises, based on observations of the differences between hepatic bile and gall-bladder bile (obtained from different subjects) have been recently confirmed by experiment. Rous and McMaster tied the common bile duct in dogs, and intubated the hepatic ducts, so that the bile drained by one hepatic duct flowed into a rubber balloon, and that drained by the other entered the gall-bladder. On comparing the pigment content of the bile collecting in the balloon with that of the bile collecting in the gall-bladder, they found that the bile in the gall-bladder contained from eight to eleven times as much pigment as the bile in the balloon. This showed that the gall-bladder could concentrate the bile coming from the liver from eight to eleven times. Rous and McMaster noted further that the concentration took place so actively that on simple passage through the gall-bladder hepatic bile became concentrated from two to four times. The mucous membrane of the cystic duct also seems to possess the power of concentrating the bile from two to four times.

This power to concentrate the bile, coming from the liver, from 8 to 11 times, enables the gall-bladder, whose capacity is but limited, to store all the bile formed during the intervals between the periods of digestive activity.

4

Observations on human beings with complete biliary fistulae—that is, biliary fistulae associated with total obstruction to the flow of bile into the intestine, show that the amount of bile formed by the liver during the twenty-four hours varies from 500 to 1200 c.c.m. An estimate by Brand, made in 1902, gave the limits of variation as 500 and 1100 c.c.m. Some physiologists state that the amount varies from 500 to 850 c.c.m. Fox has recently estimated that it varies from 600 to 700 c.c.m. Lyon and Swalm believe that these estimates fall considerably short of the actual amounts formed in *normal* individuals during the twenty-four hours; from observations with the duodenal tube method of biliary drainage they have concluded that the amount formed during the twenty-four hours may be as much as 2000 or 3000 c.c.m.

Copeman and Winston have sought to prove that the amount of bile formed in an individual is related to his body-weight. They have stated that the liver forms in health during the twenty-four hours on an average 18.3 c.c.m. of bile per kgm. of body-weight. But Pfaff and Balch have found that no such relation could be established between

the output of bile and the body-weight; they say, ".....body-weight and bile secretion do not stand in definite relations, and comparisons cannot well be made. It is an often observed fact that small animals of the same species frequently furnish absolutely larger quantities of bile than larger animals of the same kind." In a bile-fistula subject they had under observation, the output of bile did not rise in spite of a considerable gain in body-weight. It is interesting to note, however, that in the patient Mayo Robson had under his care the output of bile from the biliary fistula attained a maximum when her body-weight was at its highest.

Observations on human beings with biliary fistulae show also that more bile is formed during the day than at night. The amount formed during the day has been found to vary from 300 to 700 c.c.m., and that formed during the night from 200 to 550 c.c.m. But the night bile is richer in solids than the day bile. Mayo Robson found that in 100 parts of day bile there were only 1.79 parts of solids, while in 100 parts of night bile there were 1.82 parts of solids.

In the following table, the amounts of bile collected by various observers from human beings with complete biliary fistulae during the twenty-four hours, during the day, and at night, are shown:—

TABLE II.

Observer	Body weight in kgm	Amount of Bile in c.c.m. collected during					
			24 hours		Day	Night	1 Hour
			Total	Per kgm Body weight.			
Murchison	59	Ave	1182.8	20.0			49.3 (a)
Copeman and Winston	43	Min	709.7	17.5			14.5
		Max	842.7	19.6	435.5	407.2	54.5
		Ave	779.6	18.1			32.5 (a)
Mayo Robson	53 (b) 60 (b)	Min	764.7	14.5	434.7	330.0	11.1
		Max	1168.9	19.5	636.7	532.2	75.8
		Ave	886.5				36.9 (a)
Noel Paton (c)			500.0				20.8 (a)
			680.0				28.3 (a)
Pfaff and Balch	51.4	Ave	514.3	10.0			21.4 (a)
		Min					8.0
		Max	539.0		347.0	192.0	42.0
Neilson and Meyer		Ave	885.0				36.9 (a)
		Min					13.2
		Max					67.4
Ross	64	Min	505.0	7.9			
		Max	725.0	11.3			
		Ave	556.0	8.7	360.0	225.0	23.2 (a)
			585.0				

The observations were made in individuals who were, in spite of the biliary fistula, enjoying good health.

(a) These are averages calculated on the 24-hour output. The other figures in this column give the actual minimum and maximum 1-hour output.

(b) In this patient the minimum 24-hour output took place when her body weight was 53 kgm., and the maximum when the body weight was 60 kgm.

(c) Paton made only two observations on this patient when she was in good health.

5

Observations on human beings and experimental animals with biliary fistulae show further that, though bile formation by the liver is a continuous process, yet the rate at which the organ forms the fluid undergoes periodic variations. Thus, the hourly output from a biliary fistula in a human being may during one period be only 8 or 10 c.cm., while during another period it may be 70 or 80 c.cm. These variations in the rate of bile formation are closely related to the state of activity of the digestive tract.

When the digestive canal is quiescent, as in the fasting animal, the liver forms only small amounts of bile: the rate of bile formation is then the lowest. During digestion, bile formation proceeds at an increased rate. But the increase does not become manifest immediately after the ingestion of food: it is appreciable only when food reaches the intestines. It attains a maximum when absorption from the intestine is most active. With the subsidence of digestive activity, the activity of the liver also wanes, and, finally, the rate of bile formation returns to its low fasting level. Bile is formed during the day in greater amounts than at night because there are more periods of digestive activity during day time.

The physiological mechanism which controls these variations may be advantageously explained here. During periods of digestive activity bile formation is greatly augmented because, during these periods, stimulants of the bile-forming function, secretin and bile salts, reach the liver in the portal blood. Secretin is discharged into the portal blood when the acid chyme from the stomach comes in contact with the intestinal mucosa. At the same time (due to the relaxation of the sphincter of Oddi) bile enters the intestine. Of this bile, the bile salts are more or less completely reabsorbed into the portal blood. On reaching the liver, these substances stimulate the organ to form bile in increasing amounts. As long as chyme enters the duodenum from the stomach, so long do these processes continue. When the entry of chyme stops, secretin ceases to be discharged into the portal blood, and bile to be expelled into the intestine. But reabsorption of bile salts does not cease, for they are still present in the bowels in large amounts. These bile salts continue to be reabsorbed and on reabsorption cause the production of

considerable amounts of bile. Of this bile, little or none escapes into the intestine till digestive activity recommences in the stomach; it is concentrated by, and stored in, the gall-bladder. As the amount of bile salts reaching the liver diminishes, the production of bile by the organ becomes diminished. Finally, when absorption from the intestine has ceased, the rate of bile formation sinks to the low fasting (or basal) level.

6

Many chemical substances had in the past the reputation of being stimulants of the bile-forming function of the liver, that is, of having a cholagogue action. A list of substances having this action published by Rutherford in 1879 included sodium phosphate, perchloride of mercury, ipecacuanha, colchicum, jalap, aloes, colocynth, sodium benzoate, and sodium salicylate. But now it is known that the only substances which cause increased production of bile are the bile acids and their salts, and possibly the salicylates.

Bile acids are potent cholagogues: they increase the output of bile several-fold; they increase both the fluid and the solid output. As Cushny says, they seem to exercise "some specific stimulant action" on the hepatic cells; for, after their administration, their output in the bile is increased to a greater extent "than can be accounted for merely by the excretion of that administered." Because of its bile acid content, whole bile also acts as a powerful cholagogue. It may be mentioned here that bile acids (and their salts) and bile are the only reliable cholagogues known.

Salicylates also have a cholagogue action. The increase in the output of bile following their administration is, however, only slight; but it is apparently due to "some specific action on the liver cells." Though there is an increase in the total solid output, the increase in the fluid of the bile is much greater than that in the solids. The cholagogue action of the salicylates has, however, been questioned in recent years. In bile fistula dogs, Symth and Whipple have been unable to detect increases in the output of bile after therapeutic doses of sodium salicylate.

It has already been pointed out that the biliary activity of the liver is stimulated by the hormone, secretin, which is formed within the intestinal mucosa when the acid chyme from the stomach comes in contact with it. Bayliss and Starling say that in the intestinal mucosa a substance called pro-secretin is present, and that this substance is converted by the hydrochloric acid from the stomach into secretin. The secretin passes into the blood, and stimulates the activity, both of the pancreas and of the liver. Downs has shown that intravenous injections of secretin cause the amount of bile flowing from the liver to become nearly doubled within twenty minutes, and increased almost

four times within forty minutes and that injections of other hormonal substances do not increase the output of bile.

According to Barbera, the amount of bile formed during the period of digestion varies with the kind of food-stuff ingested. He has found that proteins cause the greatest increase in bile formation, fats slightly less, and carbohydrates the least.

An increase in the flow of bile from a biliary fistula may be noted after a copious drink of water. This increase is due to the excretion of a part of a water in the bile, and is comparable to the increased output of urine which is observed in similar circumstances. The total solid output in both bile and urine remains practically the same before and after the ingestion of water.

7

The output of bile by the liver tends to be diminished in certain conditions, physiological as well as pathological. McMaster, Broun, and Rous have shown that the amount of bile formed during hot weather is small. The probable explanation of this is that during hot weather the loss of water through the skin is increased, the water content of the bile is diminished, and, in consequence, the volume of the bile formed is reduced. The output of bile is, however, not effected by exercise.

In febrile conditions, the output of bile is diminished. McMaster, Broun, and Rous found that a severe febrile cold sufficed to bring about in the dog a great reduction in the amount of bile flowing from the liver, and even cessation of the flow. Paton and Balfour observed that the bile formed during an attack of fever was not only small in amount but also poor in solids: in a patient with a biliary fistula, they found that a febrile attack caused a fall in the amount of bile formed during the twenty-four hours from an average of 592 c.cm. to 238 c.cm., and in the solids from 9.2 gm. to 3.2 gm. The diminution in the amount of bile is apparently due to the dehydration of pyrexia, which is responsible for a reduced output of water in all the secretions of the body. Hunter says, "This diminished excretion of water appears to be the result of fever itself, irrespective of its nature; the diminution in the amount of solids, on the other hand, appears to depend upon the nature of the fever."

The output of bile may be diminished from various other causes. Macleod says, "The secretion of bile is greatly reduced by haemorrhage.....It is reduced during starvation, but continues...up to the moment of death."

8

It has been known for a long time that when the hepatic parenchyma is injured, as by chloroform or phosphorus, the bile formed is

reduced in amount and altered in character. But the injury has to be rather gross before the diminution becomes apparent; Smyth and Whipple have observed little or no disturbance in the output of bile after small or moderate doses of either chloroform or phosphorus. But they say that "chloroform in remarkably small doses, incapable of causing recognizable histological liver injury or clinical reaction, can effect a profound decrease in bile salt concentration in fistula bile." Phosphorus in small doses does not have a like effect. In large doses these liver poisons bring about a marked reduction in the output of bile and of the biliary constituents. Other substances which produce a similar effect include the proteoses, the arsenobenzol derivatives, carbon tetrachloride, tetrachlorethane, trinitrotoluene (T. N. T.), bacterial toxins, and certain poisons generated within the alimentary canal.

Drury and Rous have shown in dogs that the fluid formed by a liver severely injured with chloroform differs markedly for normal bile: it is a "white bile," is thin, watery, and pale, and contains little or no bile pigment, bile salts, or cholesterol. They regard this "white bile" as *indicative of a fundamental liver injury*. It is indeed formed by a liver with suppression of its biliary functions. A similar *white bile* has been obtained from human beings with extreme fatty degeneration of the liver (Ritter); in this condition the impairment of the hepatic functions is profound.

McMaster, Broun, and Rous have found that the fluid the liver forms when it secretes against a "pressure obstacle" is also a "white bile." This "white bile" is evidence that the liver is functioning at a lower level than normal, that there is impairment and even suppression of its biliary functions. Drury and Rous have shown in dogs that when the common bile duct is tied and the pressure in the biliary tract raised for even so short a period as 24 hours, the liver suffers injury, as indicated by the inability of the liver cells to take out of the blood stream sodium indigotate, a dye which is readily taken up and excreted in the bile by healthy liver cells. In these instances, the liver injury is usually not severe, and the organ resumes its biliary functions and forms normal bile soon after the removal of the pressure obstacle, that is, the obstruction in the bile passages. When the pressure obstacle has continued for some length of time, the liver suffers profound structural and functional damage, and recovery from this is usually long-delayed. Not only in experimental animals, but also in human beings, may the secretion of "white bile" occur in consequence of a pressure obstacle in the biliary tract. It is not unusual for surgeons to find in the common bile duct of patients operated on for the relief of biliary obstruction a thin, pale, watery fluid. Judd and Lyons have found such "white bile" in the common bile duct in 19 out of 649 patients operated on for obstructive jaundice.

"White bile" is found in the bile passages in biliary obstruction only when the obstructed bile passages are not connected with a normally functioning gall-bladder. If the gall-bladder is functioning and is in communication with the bile passages behind the obstruction, rise of pressure in the obstructed bile passages is prevented, at least for some time, by the concentrating activity of the viscus. Too prolonged an obstruction will, however, result in a rise of pressure sufficient to cause suppression of the biliary functions of the liver. The "white bile" is not a true hepatic secretion, but is formed by the cells of the bile ducts. The occurrence of "white bile" in the bile passages is of very serious prognostic import, for it bespeaks a severe liver damage.

The changes occurring in the liver as a result of long-standing biliary obstruction may be conveniently described here. The liver is shrunk to about two-thirds its normal size, is deeply bile-stained, and presents characteristic microscopical appearances. Legg noted increase in the intra-lobar connective tissue and atrophy of the liver cells, and dilatation of the bile passages. Ford has described atrophy of the liver cells nearest the periphery of the lobules, increase in the fibrous tissue of the portal tracts, a cirrhosis of inter-lobular, intra-lobular, or peri-cellular type, and newly-formed bile ducts. The condition is usually described as "obstructive biliary cirrhosis."

[Subsequent sections will be published in later numbers of the "Antiseptic".—Ed.]

DIFFICULT SURGICAL PROBLEMS IN CHILDREN*

BY

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PART II.

INJURIES OF THE HEAD.

Injuries of the head in children offer very interesting points for observation. Certain facts are worthy of note. Falls from a height are the commonest cause of such injury; deliberate injuries to the head of a newly born child are seldom without a fatal result. It is an astonishing fact that a child aged 18 months fell from the second storey and was not hurt at all. This child we have observed for five years after injury and has had no cerebral symptoms. On the other hand, a child falling from a bed which was only two feet high from the floor of the bed room was instantaneously dead. These

* Specially contributed to the "Antiseptic."

aberrations in the results from injuries to the head of children could be only explained by considering these in terms of cerebral lesion. A girl aged six months fell from a couch and injured her skull; from two weeks after this accident, she began to get convulsions starting from right side of her body and she died within a month. All head injuries in children must be carefully examined for evidence of fracture or cerebral accompaniments. These injuries must be treated on proper lines to prevent a life long deformity or mental disability. Ophthalmic specialists may be interested in some head injuries which have caused sudden loss of vision. A child aged 12 months fell from a stair case missing 8 steps and then it was found the next day that he could not recognise objects. Nothing was found in the fundus next day by an ophthalmic man whose knowledge perhaps did not extend beyond the orbit and the eyeball. Two years later an X-ray showed irregularity of anterior clinoid processes and opacity in that region suggesting an old organised blood clot pressing on the chiasma. This boy, we regret is now totally blind and few of us can restore his vision.

It may be mentioned that repeated lumbar punctures in these cases of cerebral injuries have proved of paramount value in arresting permanent damage to cerebral functions. We have had a child come to Bombay with a marriage party who fell from the first storey and lost consciousness. He was warded in Sir Byramji Jijibhai Hospital for children where he showed mental irritability, unilateral convulsions and irregular pyrexia. The cranial vault was not injured; once we thought of middle meningeal hæmorrhage and almost decided to operate on him, as he was progressively getting worse. Now, middle meningeal hæmorrhage by itself is a very rare condition in children and we drew out blood-coloured cerebrospinal fluid 10 cc. The improvement in symptoms was marked; the boy showed brightness in appearance and before he left the hospital as many as six lumbar punctures were made. The temperature in these cases is due to upset in thermal equilibrium as a result of microscopic cerebral rupture or to decomposition following disruption of brain matter.

In a particular group of cases, death is instantaneous. We saw a child aged about 5 months who fell from the fourth storey of a house along Sandhurst Road. It was a tragic sight to see. The boy's skull was pulped to pieces and the brain matter was practically disorganised. There was no external wound. This is an acute cerebral rupture where life is impossible. In a second group of cases, there is no external wound and the injury is very insignificant. Such cases are interesting from a medicolegal standpoint. Immediate death is due to intensive shock, cerebral concussion. (There is no time for cerebral compression) or sudden cessation of activity of medullary centres.

In certain cases, the injury is of such a trivial nature that a medical verdict of 'status lymphaticus' has been given. Essentially, there is always a lesion found in the posterior cranial fossa of the nature of echymoses, dural tear or medullary haemorrhage.

In a third group of cases the child does not die on the spot, there is no external mark of injury, no fracture is present. The child is deeply comatose after a severe fall e.g. knocked down by a car and coma deepens with universal paralysis of all muscles both voluntary and involuntary, the pupils are unequal and do not react to light. Cheyne Stokes respiration follows, pulse becomes very rapid and uncountable, hyperpyrexia is a feature before death which usually occurs at the end of a week.

It would be noticed that in the last group the injury has been very severe but not specifically diverted so as to have affected the medullary centres immediately on the spot. The injury though is a primarily fatal one we have here a phenomenon of gradual paralysis of all cerebral centres which culminate in vagal fatigue and total upset of thermic equilibrium. There is no question of irritability or pain; from the start, patient is deeply comatose; this coma is never recovered from. The initial damage to the brain is so acute and irreparable that repeated lumbar punctures or even bilateral cerebral decompression cannot save the child from an inevitable death. It is important to give the prognosis at the outset and refrain from operative work as far as possible.

Sometimes it is very difficult to decide whether after an injury to the head operation should be resorted to. This is especially a very delicate and difficult question as children cannot speak what they feel and unusual sympathy is felt for them by relations and friends concerned. Mistakes are liable to occur in both directions. Where no operation at all is required, from the peculiar manifestations that develop later, operation is advised; where a definite operation is required to avert post-traumatic sequelae, operation is usually not suggested.

A child aged 6 months, fell from a height of 5 feet and next day generalised convulsions developed. This alarmed the parents and it was advised by a surgeon to trephine. Two other medical men however were against operation. A day later, the child developed a very high temperature and it was found that the child was suffering from malaria, convulsions were a mere incidence during the course of the disease. The child did very well.

Every case must be judged on its own merits. Where there is definite evidence of internal or external injury time should not be lost and immediate measures must be taken to decompress. The following case is very instructive as it brings out the life history of

a child who sustained injury at a very early age of 2 years and is now still living. He is 18 years old now.

This child fell from a height of 6 feet and hurt the left side of his cranium. This accident occurred at 6 P. M., in the evening and the child was restless the whole night. Next day it was found that his right arm and leg were paralysed. Evidently there was left sided cerebral lesion probably a haematoma. The child grew up with all the post hemiplegic sequelae viz., athetosis, contractures of both extremities and certain amount of dullness at school. His speech was intact and he wrote with his left hand. He was fairly active and intelligent often times mischievous and studied up to 4th Gujarati while he was 8 years old.

After this he began to get convulsions preceded by visual aura every time. These first started in the face and became generalised all over the body. This boy is 18 years old now he gets these convulsions at diminished intervals and sometimes he lies down in bed for 3 to 4 days in a semi-comatose condition. He has profuse salivation, his mental capacity has greatly deteriorated, he cannot recognise objects nor can he speak to answer questions. He has now developed a condition of post-traumatic dementia.

Here therefore we have a case who falls from a height, is paralysed on one side of the body, develops Jacksonian Epilepsy and now becomes insane. Could this boy have been saved from mental deterioration that followed, by a timely decompression soon after paralysis supervened? Could this boy have derived some good by craniectomy for excessive callus formation, blood or arachnoid cyst?—even as late as 10 years when Jacksonian fits became fully established? We have particularly mentioned this case to suggest that operation should always be resorted to when definite organic lesion could be established after injury to head.

It would be correct to set up a formula like this; for generalised paralysis or convulsions, don't operate; for local paralysis or convulsion, operation may be performed with some hopes. Unequal pupils not reacting to light with total paralysis of the whole body, soon following injury is a primarily fatal accident and operation is of no avail here.

In open fractures of the cranial vault, infection is responsible for the heavy mortality. Even after initial wide trephining a hernia cerebri usually forms which is a very disconcerting affair, very few recoveries have been seen by us under such circumstances. This cerebral hernia is more due to the cerebral oedema that is a necessary sequelae than the infection which is usually overcome in cases that live over a week. Repeated lumbar punctures, caffeine sodiosalicylate injections and hypertonic proctoclysis or hypertonic glucose

or saline by intravenous route may all help to lower the intracranial tension.

Sometimes we have been driven to perform a cerebello-medullary puncture (cisternal puncture) in cases where a posterior cranial fossa lesion is suspected. The gravity of the situation here is very great indeed as the fourth ventricle in these cases has been severely damaged.

In all cranial injuries, a thorough examination of the thorax and particularly of the abdomen should be done at the outset, to eliminate injury to the important organs in these cavities. A ruptured spleen in a comatose child is not uncommon, the coma part being mainly due to cerebral condition.

An interesting condition may be mentioned here. Small trivial injuries in children may tear the dura and the bone and subarachnoid fluid may emerge out underneath the scalp tissues. Such may be called a cephalo hydrocele. We have seen instances of these and on aseptic puncture, clear fluid has been obtained which gives all the chemical features of cerebrospinal fluid. These swellings are not serious and we have seen them being gradually absorbed.

Children entrusted to maid servants or servant boys may fall and injure their skull. This fact sometimes is hidden from fear of punishment or scolding and so a great caution should be exercised in taking history of children who show localised paralysis or convulsions without obvious cause. Though Trotter has very ably explained the brain phenomena on the basis of capillary anaemia, haemorrhages and oedema, Rosenhagen, Duret and Symonds have further shown that the real changes take place in the nervous tissue itself. Chromatolysis and lipoid degeneration of nerve cells, fragmentation and fatty degeneration of myelin sheath and reactive changes in Macro and Mycroglia are the chief structural phenomena in brain injury. A rise in intracranial tension could not explain all the symptoms; in some cases there is very little rise indeed.

Basal fractures are usually primarily fatal injuries. In one such case, the child who was pale and cyanosed was restored to normal arterial pressure after artificial respiration and oxygen administration. This child passed a large quantity of blood from the nose and mouth twelve hours later suggesting a fracture of the anterior and middle cranial fossæ. In all head injuries, a thorough examination of the mouth, nasopharynx, nose, ear and fundus of the eye would help to reveal the extent of the injury and also the gravity of the situation.

Children who have had head injuries should be shaved completely. This supplies a very useful facility for inspection before a palpation is made. Neurologists rightly get the heads of their cerebral tumor patients shaved before a local examination is commenced.

The occipital region should be critically examined as this part of the cranial vault is not in ordinary posture exposed to view.

Nursing of head injury cases is a speciality. If an intelligent nurse is not available, it is in the interest of the little patient that the doctor should watch the patient continuously for fits, variations in temperature, pulse rate, vomiting, restlessness, increasing traumatic stupor (Symonds) etc. Each symptom has a definite value in determining the line of treatment. A surgical operation in majority of cases could be decided upon by a gradually decreasing pulse rate which would mean increased intracranial pressure. In practice, the number of such cases would be very few and far between as gross injury to the vault resulting in open fractures would be handled immediately.

Lumber puncture is not permissible during stage of shock or concussion.

ARSENICAL MEDICAMENTS AND THEIR CHEMOTHERAPY. *

By

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Bridge, as they do, over the differences between the metals Bismuth, Vanadium etc. on the one hand and the non-metals nitrogen, phosphorous etc. on the other hand, the metalloids Arsenic and Antimony occupy a peculiar position and possess certain properties peculiar to and characteristic of themselves, which are not so much visible in the metals and nonmetals themselves. Of these the most important are their therapeutic properties which have given incentive to extensive investigations and fruitful researches. I have already dealt with the chemotherapy of Antimony compounds and their recent advances in a previous communication to this journal (Vol. XXIX No. 2, 1932 p.p. 83-87). The present paper will be devoted to the studies in the chemotherapy of arsenical medicaments and their preparations. The object is to draw the attention of Indian scientists to this very important field which has been very little explored uptill now in India, though the researches in the other metalloid, Antimony has been more exhaustive in this country. Yet the possibilities in this field are very great, as not only thereby much of the drainage of the country's wealth can be stopped but also it may prove a strong and effective weapon to fight against many tropical diseases which cause permanent havoc every year in the country.

* Specially contributed to the "Antiseptic."

I shall here discuss on the following points in connection with this metalloid. (1) Various arsenical medicaments that are recognised and recommended, (2) Their preparations and possibilities in India. (3) Various diseases in which arsenicals have been applied or are likely to be of value.

Though several thousands of arsenic compounds have been synthesised, within a comparatively short period, a careful study of these will reveal that from the therapeutic stand-point only a small number of these are of interest and importance. It may also be noticed that all the organo-arsenicals are synthetic products with a possible exception in the case of diethyl-arsine which is said to be produced by the growth of moulds on carpets and wall papers containing arsenical pigments. A very interesting fact to note in connection with these syntheses, is that the earliest and the fundamental discoveries both in the aliphatic and the aromatic series were quite unexpected and brought about in a remarkably unpremeditated manner. Thus in the aliphatic series the discovery of the Cadet's fuming liquid in 1760, which may be regarded as the key to the chemistry of organic arsenicals, was a result of a search for the basis of sympathetic ink, which was supposed by L.C. Cadet de Gassicourt to be the salts of cadmium. From the investigations of cadmium salts to the discovery of an organo-arsenic compound is a typical instance of discovery by chance, which is not an infrequent incident in the domain of science. Again the most important and fundamental compound of Aryl arsenicals is undoubtedly the compound obtained by Béchamp condensation viz. *p*-arsanilic acid or Atoxyl. This classical discovery is also of the same nature, as Béchamp, its discoverer himself, regarded it as an anilide of arsenic acid and so it was supposed not to be truly organo-metallic, containing the arsenic attached to a carbon atom or the nucleus. That this reaction has resulted in a fundamental change in the constitution and that thereby a truly organo-metallic compound has been synthesised was demonstrated only in 1907 by Ehrlich and Berthelm. Thus it is a peculiar coincidence of facts that the fundamental compounds in the organic arsenicals, should be products of chance discovery.

Of the inorganic arsenic compounds, the most important is white arsenic or arsenious oxide, which was known in good old times. It was used during the Ayurvedic periods (as *Haritalvasma*) in India and in Syria the practice of arsenic eating was in vogue though in secret. Well-authenticated cases of such arsenic eating are known (Roscoe, "On the Alleged practice of Arsenic eating in Syria-Memoir of the Lit. and Phil. Soc. of Manchester, 1860). In one case a woodcutter was seen by a medical man to eat a piece of pure arsenious oxide, weighing 4.5 grains and next day another piece weighing 5.5 grains without any harm to his normal health. Such practice of

the arsenic eaters enabled them to bear heavy weights (*i.e.* to increase respiratory powers) and improve complexion. The doses which these people withstood are quite fatal to ordinary people. In much smaller doses arsenious oxide and alkaline arsenites (*e.g.* Fowler's solution) are largely used in skin diseases, nervous complaints and in intermittant fevers. Inorganic salts (with sodium, potassium, Iron) and organic salts (with Strychnine, quinine etc.) are also used as general tonics.

The inorganic arsenic compounds suffer from the disadvantages that they are very toxic and have therefore been much superseded by the synthetic organic arsenicals, where by direct combination with a carbon atom, the toxic properties of the metalloid have been considerably lessened. In the aliphatic series the most important arsenicals are cacodylic acid and Arrehnal. The former is usually used as sodium salt but its calcium, magnesium and iron salts are also in vogue. Sodii Cacodylas (Sodium dimethyl arsinat) is used in Tuberculosis, Cancer (particularly of the stomach), Malaria and Chronic skin affections and Cacodylic acid itself was used as far back as 1862 in treatment of skin diseases and in pulmonary tuberculosis. Arrhenal (New Cacodyle) is the sodium methyl arsinat, obtained by Meyer's reaction from arsenious oxide and methyl iodide in presence of excess of alkali or from methyl sulphate (Augur). It is used to a considerable extent for treating Tuberculosis in early stages and as general tonics. Good clinical results are said to have been obtained in anæmia with the Strontium salt of an arsenical additive compound of Behenolic acid. The salt has been introduced into pharmacy under the name of "Elarson" (As=13%).

These briefly represent the most important of the aliphatic arsenicals that are in vogue. We shall now make a study of the more important and interesting group of the arsenic compounds, namely, Aryl arsenicals, which again may be divided broadly into two classes. (1) Pentavalent arsenic derivatives (2) trivalent arsenic derivatives. While studying the action of oxidising agents on aniline (which drew the attention of the then Chemists following the discovery of Mauveine and Magenta), Béchamp in 1863 found that Arsenic acid could react with aniline without oxidising the base. By heating aniline arsenate with excess of aniline at 190°-200°C, he obtained, besides colouring matters, a colourless product which he supposed to be an acidic anilide ("Phenarsenyl Ammonium") comparable with oxalic acid. Atoxyl was exploited by the Germans, the process of making being concealed and it was erroneously described by them as a compound of arsenious acid following on Béchamp's error. The above view was held until 1907, when Ehrlich and Berthelm demonstrated the true constitution of Atoxyl. Arsacetin, obtained by acetylating Atoxyl, is less toxic than Atoxyl.

and its solution can be sterilised without decomposition. These are no longer in use, formerly used in skin diseases, Anaemia, Syphilis, Elephantiasis, Malaria, Tuberculosis and Trypanosomiasis. Other important pentavalent arsenicals are Hectine, Tryparsamide and Stoversol. Chemically Hectine is the Sodium salt of Benz-sulpho-p-amino-phenyl-arsenic acid. It can be sterilised by boiling and is used in primary, secondary or tertiary forms of Syphilis with good result. Stoversol is Acetyl-amino-hydroxy-phenyl-arsenic acid. It has been recently tried with success in Syphilis, Amoebiasis, Malaria etc. It is administered orally. However the most important of the pentavalent arsenicals, from therapeutic stand-point, is Tryparsamide (sodium-n-phenyl-glycinamide-p-arsenate). This has been found to give satisfactory results by all methods of administration—intravenous, intramuscular, subcutaneous and its toxicity is about 1/20 that of Salvarsan. Largely used in Trypanosomiasis.

Trivalent aryl arsenicals constitute the most important group among the arsenic compounds. Bunsen observed that the Cacodyl derivatives containing trivalent arsenic are much more active physiologically than cacodylic acid and its salts in which arsenic is a pentad. Ehrlich similarly noticed that amongst aryl arsenicals those containing trivalent arsenic are much more potent Trypanocides and Spirochaetocides than the compounds of quinquevalent arsenic. Most important of these trivalent arsenicals is Salvarsan (No. 606), which was arrived at by Ehrlich after trying 605 arsenical preparations. It is the dihydrochloride of dioxy-diamino-arsenobenzene. The commercial product is a pale yellow microcrystalline powder containing free and combined sulphur, to which the varying toxicity of different commercial samples of Salvarsan are apparently due. The arsenic content is therefore always less than is required by theory. It is very oxidisable in air, especially in aqueous solution, and it then becomes extremely poisonous as its oxidation product, 3-amino-4-hydroxy-phenyl-arsenious-oxide is 20 times as toxic as Salvarsan. It is only stable in the dry condition when kept in closed vessels. Colour is no criterion for safety of various samples of Salvarsan, for when tested on rabbits samples of clear yellow tint have sometimes proved so toxic that the experimental animals have succumbed during injection. It is a specific for Syphilis and is also used in Malaria, Yaws, Framboesia, Pernicious anaemia and other diseases. As Salvarsan is too acidic, it is administered by neutralising with alkali, which requires obviously considerable technical skill, a fact which goes much against its extensive use. Various metallic compounds of Salvarsan are also known, of which may be mentioned, "Salvarsan Sodium" (1026A, Ehrlich), a yellow powder readily dissolving in water and requires no alkali to dissolve it. Silver and copper Salvarsans which are also effective Spirochaeto-

cides are regarded as co-ordination compounds which have the combined effects of arsenobenzol and the metallic constituents silver and copper. Although when skilfully administered, Salvarsan produced favourable results in the great majority of cases, yet the preliminary chemical treatment is a matter which needs careful adjustments. On this account search was made for a drug which would combine the valuable germicidal action of Salvarsan with the property of dissolving in water or physiological salt with a neutral reaction. Ehrlich's solution of this problem resulted in the production of another drug, Neosalvarsan (No. 914), introduced into Therapeutics in 1911. It is the sodium-dioxy-diamino-arsenobenzene-N-methylene-sulphinate. Another improvement in a similar direction has been made in the compound which is known by the synonyms, Myosalvarsan, Sulpharsenol, Sulpharsphenamine, Sulpho-stab etc. It is the disodium salt of dimethylene-disulphonate of arsenobenzol and can be used intramuscularly without causing any pain, an advantage over Neosalvarsan which is administered intravenously only. These are therefore nowadays greatly preferred and their use is likely to supersede that of Neosalvarsan. Other Salvarsan derivatives of importance are: "Galyl" which is 4:4' dihydroxy-arsenobenzene-3:3' phosphamic acid, issued in the form of its sodium salt (No. 1116 of Mouneyrat's series). According to some it is regarded as very active but complaint is made of irregularities in quality etc. It can be used intramuscularly. Luargol is an arsenobenzol reinforced with silver and antimony. Some doctors find it extremely active. Its disadvantage lies in the high content of caustic soda in the solvent used. Chemically it is Diamino-dihydroxy-arsenobenzene-silver bromide-antimonyl-sulphate ("102" of Danysz's series). It is used intravenously only.

The various arsenic compounds which have practical and therapeutic interest have been discussed briefly. It will be interesting to cite the following from M. Ravaut's report containing a summary of the results of 95,000 intravenous injections of arsenical compounds, performed by French Military Medical Service during the first two years of the war.

Novarsenobillion—preferred to all others. All find it at least equal to Neosalvarsan and sometimes superior. Incidents following an injection appear less frequent.

Neosalvarsan—very good.

Arsenobillion and Salvarsan—Are considered very active. One doctor only has used them systematically. Only used in rare cases due to difficulty in the technique of its administration.

Galyl—Very active according to some. Complaint is made of irregularities, in quality of variations in solubility and the frequency of small accidents following on injection.

Luargal—Some find it very active. Undesirable effects produced due to too high a content of caustic soda used for preparing the solution.

To the above may be added that during recent years, the tendencies of the doctors is to prefer those salvarsan derivatives which can be administered intramuscularly without causing pain, so that they can be pushed in the case of children and fatty bodies for which intravenous injections are not convenient. Intramuscular preparations like Sulpharsenol, Mysosalvarsan etc. are therefore now-a-days gradually gaining the field and it is not unlikely that these will ultimately replace the Neosalvarsan group of arsenicals.

We shall next discuss about the possibilities of arsenical preparations in India. As I had the opportunity of preparing Sulphoarsenobenzene derivatives of the type of Sulpharsenol etc. and other therapeutic arsenicals for the first time in India (a paper which has already been read, in abstract, in the section of the Medical and Veterinary Research, of the Indian Science Congress, Nagpur, 1931), I think I am in a position to say something about the possibilities of the manufacture of such preparations in this country. First thing, unlike other synthetic preparations, Salvarsan derivatives require a technique of the high order, as different samples prepared under apparently identical conditions vary unexpectedly in their toxicities for some unknown reasons, a fact which has been noticed by many manufacturers on the line. It is therefore absolutely necessary to test very sample clinically before putting in the market. Secondly, while it is not much difficult to prepare an apparently pure sample of a Salvarsan derivative, to prepare a non-toxic sample is much more difficult and is a quite different thing. Preparations of Salvarsan derivatives should therefore fall in skilled hands. Thirdly, it is to be seen whether the cost of production will allow the preparation to stand against the hard competition from the foreign firms. The writer's experience is, that though India has to depend on Europe for many of her starting-out materials or chemicals, yet it will be much profitable and will increase her wealth considerably if such enterprises be undertaken. The Salvarsan preparations have a brilliant future in every civilised country, for besides in venereal diseases, they have their applications in many others, which will be discussed later on. It is therefore incumbent on the Indian scientists not to allow India to be dependant on foreign countries for such useful drugs. If proper care be taken, it is a wrong notion to think that Indian preparations are in any way inferior to foreign ones and with proper

encouragement it can be well expected that very soon Indian products will hold the market.

The most important of the arsenical medicaments which have considerable demand are Atoxyl, Stovarsol, Neosalvarsan and Sulpharsenol types of compounds. All these preparations can be started together from the same firm as they are more or less interdependent. Atoxyl, which by itself has now no much demand in therapy, is usually the starting-out material for salvarsan preparations. It can also be now obtained in commerce at a comparatively cheap price. There are various methods which can be followed in the synthesis of salvarsan, but the most convenient one is to prepare its oxalyl derivative which can be smoothly nitrated. The nitro compound on warming with caustic potash solution for several hours yields the hydroxy-nitrophenyl-arsenic acid in quantitative yield. This on reduction with alkaline sodium hydrosulphite in presence of $MgCl_2$ yields the salvarsan base which is then converted into its dihydrochloride by methyl alcoholic hydrochloric acid. Under different conditions of reductions of the hydroxy-nitro-phenyl-arsenic acid with the same reducing agent, hydroxy-amino-phenyl-arsenic acid is obtained, which on acetylation yields Stovarsol types of compounds. Salvarsan, on treatment with sodium formaldehyde sulfoxylate, yields neosalvarsan types of compounds, while with CH_{2O} and $NaHSO_3$ yields sulpharsenol types of arsenicals. These very shortly give an outline of the Chemistry of the most important therapeutic arsenicals. Several Indian products have already appeared in the market. Thiosarmine is the name given to the brand of Sulpharsenobenzene prepared by the writer in the B. R. Institute, Calcutta of which reference has already been made (Loc. cit.). The following properties and a comparison of the toxicities of Thiosarmine with Sulpharsenol and Sulpharsphenamine, reveal that it stands favourably in comparison with foreign brands. "Thiosarmine is a light yellow powder of slightly varying shade. It dissolves very readily in water to form a clear yellow solution which is neutral to litmus paper. The solution is fairly stable and does not change in colour or form a deposit on standing over 48 hours. Its arsenic content is 19.5% to 20.5%. Its M.T.D. varies from 250-350 mgm. (average 300 m.g.) and M.L.D. from 450-500 m.g. (average 490 m.g.) In the case of sulpharsenol M.T.D. is 240 m.g. (average) and M.L.D. 438 m.g. (average) and in the case of Sulpharsphenamine, these are 300 m.g. and 400 m.g. approximately." Regarding its curative value, in a recent paper published in the Indian Medical Gazette, Vol. LXVI, No. 11, 1931, Mallya and others have found it "to be a powerful specific in the treatment of Syphilis in various stages of the disease." Moreover it has been found to be "non-irritant and there is very rarely any sign of intolerance

as indicated by salivation, dermatitis etc. No indication of abscess was noticed in their cases at the seat of injection." It is therefore encouraging to note that Indian products are in no way inferior to the foreign ones and the sooner does our inferiority complex or such mentality vanish the better. Indian products of the nature of Stovarsol, Neosalvarsan etc. have also been recently placed in the market under various trade names.

The various diseases which can be attacked with the help of these arsenical medicaments may be now briefly summarised. Internal use of arsenic compounds, as we have already mentioned in the case of arsenious oxide, was known long long ago as Haritalvasma (arsenious oxide) was mentioned long ago in Ayurvedic literatures and which is still largely used in that school of medicine. It was extensively used in Syria in large doses. But the examination of the physiological action of synthetic organic arsenicals was first carried out by the classical worker on the line, Robert Wilhelm Bunsen, who made the remarkable discovery that although Cacodyl and its oxide are both poisonous, yet Cacodylic acid, containing 54% of soluble arsenic is nevertheless practically non-poisonous. In the form of its sodium salt Cacodylic acid has been employed medicinally. For treating Tuberculosis in early stages and as general tonics Cacodylates and Methyl arsenates (Arrhenal etc.) are used to a considerable extent. However the most important are the applications of "aryl" arsenicals in various diseases. Thomas of Liverpool first applied atoxyl in Trypanosomiasis. 2 c.c. of saturated solution as first dose, repeated after 15 days. Koch thought it to be specific. But it has the risk of optic atrophy and is of no use in the second stage of the disease. However the most important of the pentavalent arsenicals which is largely used in sleeping sickness is the American product, Tryparsamide, which has already been mentioned. The most important and extensive use of arsenicals is in the treatment of Syphilis which is so prevalent in all civilised countries. In this sphere it is only the trivalent arsenic compounds that are very efficacious and they here act as specifics. The adage, "Once Syphilitic, always Syphilitic" is now a thing of the past, and it is simply due to the eminently potent arsenicals of the type of salvarsan introduced by Ehrlich. In Yaws, salvarsan and allied compounds hold the field, as they act specifically with dramatic effects. Stovarsol (orally) has also been found successful in such cases. Tertiary cases heal slowly with arsenicals. In Malaria arsenic in inorganic form had been used long ago (e.g. Tabloid Ferricitras Co. in combination with iron and quinine) but they have no effect on the parasites and only act as tonic and help to repair anaemia. Salvarsan is fairly effective against benign tertian but not against subtertian infections in which case they may prove dangerous by

provocating the latter. Stovarsol has been used with some effects but the results have not been confirmed. Hectine is said to be harmless and effective in Filariasis in doses of 2 c. gm. subcutaneously every other day for 20 days. Tryparsamide has been found to be more effective. In Schistosomiasis (Bilharziasis) and Leprosy, arsenicals are of little use, though few favourable reports have appeared. In plague, Neokharasivan has been used, with favourable but inconclusive results, in few cases only. In Dermal Leishmaniasis (Oriental Sore), Stovarsol definitely improved three tartaremetic resistant cases and is therefore worthy of trial. It has also been found useful in Chronic dysentery and has cured emetine resistant cases with occasional relapses. Treparsol (28.75% As.) has been recently recommended to Amoebic dysentery. In Pernicious Anæmia, marked improvements are noticed after administering Arsenicals.

In conclusion, I would make an appeal to Indian scientists to concentrate their energies on the synthesis of therapeutic arsenicals and thereby save their countrymen from the great ravages of tropical and other diseases and also add to the wealth and prosperity of the country. In the present days, when so much active sympathy is felt for indigenous products, an enterprise in such a direction is bound to be crowned with success.

SUBPHRENIC ABSCESS*

BY

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Etiology.—Subphrenic abscess is either primary or secondary, although the true primary variety is very rare and is usually due to traumatic affections like stab wounds etc.

Secondary subphrenic abscesses are more common and are the result of (1) direct extension from the neighbouring primary focus. (2) lymphogenous infection from a more remote source, (3) Blood stream infection. The majority are due to direct infection, e.g. perforation of stomach, appendix or gall bladder or sometimes they form a walled off abscess as in general peritonitis.

The lymphatic connection between the subphrenic spaces and the abdominal viscera are two fold. (1) The retroperitoneal cellular tissue (2) from around the epigastric artery, to the falciform ligament which is in close association with the lymphatics of the appendix and colon. (3) Subphrenic lymph spaces which pass through the diaphragm connecting with the pleural plexus of

* Special ly contributed to the "Antiseptic".

lymphatics. Although infection usually travels from below upwards it may proceed from the pleural cavity downwards.

Blood stream infections are usually the result of thrombophlebitis, secondary to appendicitis, diverticulitis, or some other infected abdominal viscus. Rarely are they secondary to remote foci, such as boils. Metastatic liver abscess with secondary rupture, into the subphrenic space must be a much more common sequence of events than direct haematogenous infection of the subphrenic space.

Pathology.—The pathology is that of an abscess in the areolar tissue or a localised peritonitis. The abscesses are either acute or chronic. The latter may not be recognized for weeks, months or a year or more and cause the greatest difficulty in diagnosis. Perforation into the viscus is rare but may occur into the stomach, the colon, pleural cavity, pericardium or bronchus. Spontaneous rupture through the pleural cavity, is not common as before. *B. coli* is the most common organism present.

According to Nather, the subphrenic space is classified into two divisions viz.—the suprahepatic and subhepatic, limiting the inferior border, to the transverse colon and mesocolon. The space above the liver, may be divided into right and left, by the falciform ligament, and these in turn into large anterior and small posterior, by the coronary ligaments. In addition to these intraperitoneal spaces, extra peritoneal infection occurring between the reflected peritoneal borders of the coronary and the falciform ligaments has been described.

Signs and Symptoms.—The symptoms may begin insidiously or abruptly. The patient looks and feels sick. Fever, chills and sweats, are significant. The temperature is of the 'Church steeple' character, suggesting pus under tension. The respiratory rate may not be in keeping with the temperature. Hiccough is always a suspicious sign although it occurs in only half of the cases. Shortness of breath and difficulty in breathing, may be present. Epigastric pain, may be severe or slight, but subcostal tenderness is present. Pain in the root of the neck is usually present.

Differential Diagnosis.—Subphrenic abscess must be differentiated from empyema, liver abscess, neoplasms and perinephric abscess. Physical examination reveals, a sick individual with flatness as a rule on the infected side due to elevation of the diaphragm. Air in the abscess cavity may give a tympanitic note instead of flatness and on the left side, gastric tympany may complicate the picture. Heart may be displaced upwards, but not laterally. Bulging in the epigastrium, or on the affected side in the region of the lower ribs, occurs in most late cases. Oedema and redness of the overlying skin, is present in most cases. Liver is displaced downwards. Leucocytic count varies from 16000 to 40000 being higher in those cases,

complicated by liver abscess. Fluoroscopically the diaphragm on the affected side, is smoothly elevated, as contrasted with irregularities due to old pleural adhesions, or to nodular irregularities of metastatic liver carcinoma, and liver abscess. The splinting of the diaphragm, in very noticeable and much more marked than in diaphragmatic paralysis or in lesions of the liver.

A true subphrenic abscess is located between the domed surface of the liver below, and the diaphragm above, although the term is applied to any collection of pus between the diaphragm above and the transverse mesocolon below. The liver and the coronary ligament divide this area into an anterior and posterior space. The upper part of subphrenic space, is further divided into a large right, and small left space, by the suspensory or falciform ligament. The liver also divides the space, into a subhepatic and infrahepatic space. There is an extraperitoneal space, which is situated between the folds of the ligaments of the liver. The vast majority of abscesses occur on the right side although the one on the left may be found as a complication of perforation of the stomach, pancreatic, renal and splenic infection. Colon bacillus is the most common cause, although other cocci and tubercle bacilli may be found. The origin, may be from appendicitis, gall bladder disease, pneumonia, empyema, pleurisy, perforated duodenal ulcer, trauma to upper abdomen, and exposure. The infection travels up behind the colon, from a retro-coecal appendix, or it may extend up the sides, or in front of the ascending colon.

Peristaltic action of the colon, is believed to aid in carrying the infection to the under surface of the diaphragm. The subdiaphragmatic infection, may spread upwards through the lymphatics of the diaphragm, especially on the right side and be the cause of prolonged empyema of the pleura. General peritonitis, may be the cause of subphrenic abscess. Gas is found sometimes as well as pus in the abscess, and denotes perforation of a hollow viscus, or the presence of *B. Coli* or other gas forming organisms.

When symptoms of disease in the lower part of the chest, or upper part of the abdomen, appear following an acute or chronic abdominal disease, we should suspect subphrenic abscess. The symptoms are almost always associated with, or closely resemble, those found in diseases of the lower part of the thorax. The patient is septic, there is pain in the epigastrium, right or left hypochondrium or lumbar region, and referred upwards between the scapulae. The pain is sharp and pleuritic in character. In an abscess on the right side a perihepatitis is usually present also there are rales in the lower chest. Rarely an associated pleurisy with effusion is found. Fever is of septic type.

If pus is not immediately encountered on the top of the liver the area should be packed off with gauze and the posterior surface of the liver explored with the finger. When the abscess cavity is encountered it should be drained without further exploration or else the protective barrier of the abscess wall may be ruptured and the infection spread. Two large rubber tubes are placed in the bottom of the cavity and into each a catheter is placed for irrigation. Walling off gauze is left in place for forty eight hours, and at this time hourly irrigation with saline solution or surgical solution of chlorinated soda is begun. The drains are removed at the end of a week and smaller shorter ones are substituted. The gradual shortening of the drain rather than their early removal, will obviate the danger of recurrence of the abscess, and will ensure healing and obliteration of the cavity at its deepest part.

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TREATMENT OF FILARIASIS.*

BY

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In our search after truth, our endless attempts are not always crowned with success. With the onward march of Medical Science, sufferings of mankind are mitigated day by day—but perfection, seems far beyond our expectation—when we think how helpless we are in treatment of filariasis, of asthma, of carcinoma etc. A friend of mine—a bacteriologist—a chronic sufferer from filarial fever and occasional attacks of chyluria, spoke out his mind—when he was asked—how he has been cured of the terrible disease. He said that he had all Modern Therapy can boast of. First a course of soamine, then I.V. N.A.B., then intravenous antimony and as time grew, intravenous typhoid vaccine, next treparsamide and finally Major Acton and Rao's strepto-staphylo vaccine. Each course gave him relief for two to three years and no more, curiously enough he was given a trial of every new thing but neither new nor old—gave him permanent relief. He remarked that he had at last taken hold of a talisman which seemed to have permanent effect on his disease. A scientific man has at last to be satisfied with a charm-cure! But such is the lot of many filarial patients.

*Specially contributed to the "Antiseptic."

Thanks to Acton and Rao for their finding out the phenomena of 'Kataphylaxis' in filariasis. They hold that it is the eradication of secondary sepsis that will lead to success in treatment, of course, their investigation carries much weight—but it is difficult, from common practitioner's point of view, to find out septic focus, by means of radiological and bacteriological examination of the system and then to try for its cure.

Coming to the practical side of the question—we shall see that there is no specific therapy for filariasis—as Quinine is specific for malaria and Arsenic for Syphilis. For, no drug can yet reach the parent filariasis in thoracic duct or deep lymphatics. And it should be remembered that we can have very little hope in reaching the parents by injection—if in future there is found any specific, the scientific specific would act by mouth and reach the parasites in the thoracic duct to put an end to them.

In old Ayurvedic system, treatment of filarial fever was by bitter principles, and purgatives. Latá fruit—one of the bitterest fruits is held popularly to be specific—to my experience has cured one who was resistant to all sorts of injection treatment. Older physicians of past years have tried to fight the disease with Quinine, Iron and Arsenic—but they have not claimed much of success from it.

We shall presently describe the various modes of treatment that are in vogue. But each drug has its own advocate and one is not sure which will fit an individual. Apparent cure for a year or so obtained with all treatments, though I found cases where every treatment was useless even for a short period. For our purpose, let us divide the subject as follows:

- (1) General treatment.
- (2) Oral method.
- (3) Treatment by injection.
- (4) Operative treatment.

The subject of operative treatment for elephantoid condition is not the object of the paper—through the removal of elephantoid tissue, removes an area which has the chance of secondary suppuration every day, gives comfort to the patient and removes many micro-organisms—still recurrence of fever and condition is rather rule in 75% of cases—if treatment of filarial condition with modern therapy is not adopted side by side.

General Treatment:—The most important point is the change of place to a clime where filarial incidence is much less. There are remarkable instances—where a patient suffering from filarial chyluria in Calcutta and undergoing typhoid vaccine treatment had no improvement till he flew to Ranchi where he saw the subsidence of all symptoms the very first morning he reached there. An Indian patient remarked that he had no

The temperature may remain normal for months and the patient completely recover from the former illness, before there is sudden appearance of pain, elevation of temperature leucocytosis and other symptoms of severe infection.

Paralysis of diaphragm, with depression of liver may be an early symptom, if the abscess is intraperitoneal. The liver does not move up and down freely with respiration and there may be jaundice. There is dullness on percussion in the lower part of the chest, which may extend from the third rib anteriorly to the Poupart's ligament. The dullness is higher in front and lower behind. The upper line of dullness is not as well defined as in pleurisy with effusion, and change in position of the patient, does not affect the area of dullness. The chest movements are not impaired to the same extent as in pleurisy with effusion. The heart is not displaced unless there is an associated pleurisy with effusion. If gas is present in the abscess there is dullness above the tympany of the gas area. Presence of hiccough is an important sign.

Rapid breathing associated with cough and expectation are not marked symptoms if present at all. There is usually rigidity with a sense of fullness in the upper abdomen either on the right or left side and tenderness over the affected side is frequently seen.

When the subphrenic abscess is well developed the mortality is 20 to 50%. Early diagnosis and treatment are therefore very important.

Treatment.—Aspiration needle should not be used in making diagnosis, it is dangerous as in the case of appendicular abscess. When the abscess is located by exploring through an incision in the right rectus, the viscera are walled off by saline pads and great care is taken to use suction to remove the pus without much spilling, which can be easily done by employing the ordinary suction tube, such as is used by laryngologists. Then a counter opening is made between the ribs in the lateral or posterior wall of the upper abdomen and through and through drainage instituted. Or only the lateral incision may be used for drainage in which case the abdominal wound is closed. It is also possible in some cases to make an incision along the costal border down to the peritoneum. Then the peritoneum is stripped down and abscess entered extraperitoneally. Some cases can be drained, through an intercostal incision between the 9th, 10th and 11th ribs, if there is definite evidence that pus is present in the posterior space but if this is done, the simple intercostal incision is employed, and a double rubber tube inserted, into the abscess cavity until the patient's condition is improved.

The pleura need not be opened for draining a subphrenic abscess. If an empyema is present the pleura is drained through the same incision, puncturing the diaphragm or through a higher

intercostal incision. Accurate and early diagnosis of subphrenic abscess is difficult. Exploratory needle is misleading and dangerous. Early treatment is important. Transabdominal route is better than the hazardous transpleural route.

Dr. Lilienthal's method.—The patient lies prone with a pillow underneath his abdomen and with his head lower than the location of the proposed incision. A portion of the 9th rib is subperiosteally resected, the pleura pushed away from the diaphragm, and the subphrenic abscess then aspirated and drained. Subphrenic collection of pus in the neighbourhood of subphrenic abscess will be found and can also be drained. If during the approach the pleura is accidentally opened very little air will enter, because of the posture of the patient. It is then possible to suture the upper edge of the pleura to the diaphragm at a distance from the wound of entrance, so that a large area is exposed, through which aspiration and then drainage could be accomplished.

When the abscess points in the epigastrium or in the subcostal space, drainage is best accomplished by the abdominal route. Sufficient walling off has already taken place and care should be exercised in exploration. For high lying abscesses transpleural route is advocated. Resection of the 9th rib on the right side (7th or 8th on the left) in the posterior axillary line, and careful suturing of the pleural layers should be done, but it may give rise to empyema.

When the abscess appears on the upper and posterior surface of the liver diagnosis and operation are more difficult.

1st stage.—The costophrenic angle of the pleura is obliterated. About 2" of 8th or 9th rib in the posterior axillary line are subperiosteally excised. The intercostal vessels and nerves and muscles are removed, so as to give a clear view of the underlying pleura. The wound is widely retracted, and through the parietal pleura the lung can be seen moving with each respiration. Below the lung the diaphragm covered by the diaphragmatic pleura can be seen. The lung is pushed upward and held by warm gauze pack and the parietal pleura united to the diaphragmatic pleura with eight or ten interrupted sutures of catgut placed in a circle. The stitches are placed deeply so as to include the diaphragm, and the ends are left long, so as to be used as retraction sutures at the second stage of operation. In order to cause firmer adhesions and a safer obliteration of the costo-phrenic angle the wound is packed with gauze. Forty eight hours later the gauze is removed. The pleural surfaces will then be adherent. The sutures previously placed are used for traction, and a large needle can be passed through the diaphragm into the subphrenic space or an incision immediately made and the space explored with the finger.

elephantoid fever for 3 years he was in England. Perhaps the climate and the season—the humidity of another place paralyses the activity of the parasites, or incapacitates parents to breed for the mischief of the system. The question that there is no chance of reinfection from infected mosquitoes in these cases is a farsighted one.

Next is the eradication of secondary sepsis. I have seen instances where patients suffering from elephantiasis—have come for treatment of syphilis, and who, when treated with Hyd. Salicylate injection or Bismuth therapy, have been relieved of filarial fever. Filarial cases with Gonorrhœa have also reacted, much beyond our expectation, with mixed Gonococcus vaccine. In any district—Pyorrhœa is rather the rule with every filarial case and some of these have miraculously improved even with stock pyorrhœa vaccine and a little attention to their teeth.

Last, though not least, is avoidance of intestinal stasis—of exposure to moisture and cold and of exposure to reinfection in the spot. It is commonly seen that patients predisposed to attack abort one attack by taking salines or purgatives. Perhaps the lymph-stasis favours the production of microfilariae and purgatives, by removing the lymph stasis renders the parents inactive for bearing out children. Cold and moisture may act by lowering the general resistance. Or there may be certain humidic condition of atmosphere which is favourable for producing micro-parasites or for sending them to active circulation. A filarial patient must try to avoid it.

Oral method:—Of drugs that are commonly in use. Lodha, (Ext. Lodha liq—B.C.P.W.) Arsenic, Iron and Salines are made most of. 'Lodha'—when used for long—seems to keep a patient free from attack for sometime if he comes at the onset of the disease. 'Capsicum' is also empirically used. But colloidal preparations of Arsenic are found to be most useful by mouth. I have distinctly found symptoms of chyluria to vanish in two cases with the 1st dose of Crook's Collosal Ferro-arseno Manganese preparations. Manganese is a drug which is potent for strepto-staphylo organisms. We are looking forward for the day when a drug by the mouth when absorbed via lymphatics will kill the adult filaria for good.

Apart from actual cure of filariasis, the following conditions or complications call for medicinal treatment, (1) Pain—of the swelling part, of acute filarial orchitis which is often as grave as in obstructed Hernia often leads the patient to seek relief under morphia. Neither Sodi salicylas, aspirin nor bromides are so effective. Application of antiphlogestine, hot poultices, dry fomentations are of temporary relief.

Vomiting and Nausea:—During paroxysm of fever are often very troublesome. Chlorotone, and relief of bowel are sufficient to check the condition. Hæmochyluria—'Calcium' in any form is indicated to check the blood which often comes along with chylous urine often the patient has much dysuria to pass the clotted fatty substance. He is to be treated with urinary antiseptics and diuretics—caprakol often relieves the trouble. Diuretin, Hexamine, Punasnara, Scoparium are often used for the condition.

'Filarial' Septicæmia:—The condition is very fatal and requires urgent attention. It is doubtful whether it is streptococcal or due to liberation of heavy toxin during the liberation of microfilariae from adult worms. Antistreptoserum in heavy doses with sulfarsenol was tried concurrently in two cases with no result. Electargol and Quinine injections were effective in one. But as cases are few and far between, I had not the opportunity of trying these and in my opinion Electargol is the most useful.

Diarrhœa:—Diarrhœa often following a paroxysm is extreme and often stimulants are required to keep the pulse. The diarrhœa is eliminative and Dimol on zinc steel, or Kaolin in sufficient doses are more useful and rational than Bismuth therapy. Filarial arthritis, Synovitis—requires no special medication except wrapping with flannels, hot application, Salicylates and ordinary liniments.

Leukoderma:—In several instances leukodermic patches are visible on elephantoid parts of long duration. The lack of pigment is due to loss of melanin pigment consequent on drain of Adrenals by constant chronic infection. Application of oil Bouchi for a long time may serve our purpose.

Treatment by injections:—It can be divided into (1) Injections of Arsenic (2) of antimony (3) protein shock therapy (4) combination of (1) & (3) or (2) & (3), and (5) other injections.

Arsenic:—A. Soamine is the oldest and commonest drug. It has been pushed upto 40 and 50 grains subcutaneously and has been found effective in very few for good. With some, it has checked the fever for a year or two, or three. Sir F. P. Connor advocates the use of 1 gr. soamine intravenously weekly or biweekly and is of opinion that 6 injections are sufficient to effect cure in some and to give relief for longer period.

B. N.A.B.—N. A. B. injections are not more effective than soamine. But it should be tried in cases of syphilis.

C. Sulfarsenol—S.C., M or iv is also tried. Results are not more promising than soamine Treparsamide—which is made most by Rockefeller Foundation is now in use. But it often leads to optic

atrophy and retinitis and is a dangerous drug in the hands of ourselves if expert ophthalmoscope examination can't be made of patient's eyes from time to time. It has many advocates who prescribe it more for chyluria than for any other condition. Six graduated doses often check the fever. It is too soon to speak with any certainty about the efficacy of Treparsamide.

Antimony:—S.A.T:—a course of 10 or 12 injections acts as a charm to some with whom soamine is a failure.—But permanent cure is not always seen.

Neo Itilosan—is another antimony preparation which was used in two cases. It is too early to draw any conclusion about it—for we have to watch for some years a patient.

Protein-shock therapy:—To me cases have come which have undergone course of Arsenic and antimony. This is the therapy which is most effective of all and relief is more prolonged. Some 60 cases have been treated primarily or secondarily—but relapse of fever or no cure is obtained with five only (*observation for 3 yrs*). Perhaps secondary sepsis was too strong in those cases. The route usually followed is intravenous. But intramuscular injections with high doses or subcutaneous injection too may be effective. Recently intracutaneous method is advocated by Acton and Rao.

Typhoid Vaccine—or T.A.B vaccine was the first method that was resorted to. Streptostaphylo-vaccine is also used. It is more potent in cases with pyorrhoea on any other evidence of secondary sepsis. Here autovaccine should be used.

Aolan or Milk—Injections intramuscularly may act as protein shock.

Autohemotherapy is advocated by some.

But in discussing about the proteinshock—it can't be definitely said how it acts. If the shock occurs effectively—it must kill those that are in blood-circulation i. e., microfilariae. But it is doubtful if the shock can affect the parent filariae in the lymphatic circulation or can reach the elephantoid part. It is sure that there is no chance of 'As' or 'Antimony' reaching the lymphatic circulation—but what they do, they do by reaching the microparasites or by increasing the resistance of the patient. Just as 'Arsenic' does not kill off spirochaete itself but by combining in liver with its antitoxic body serves as organotropic for *S. Pallidae*—the arsenic too similarly may make the system unfavourable for parent filariae to thrive properly for breeding.

Recently Indian Laboratories have put on the market vaccines in combination with Soamine or other organic Arsenic preparation.

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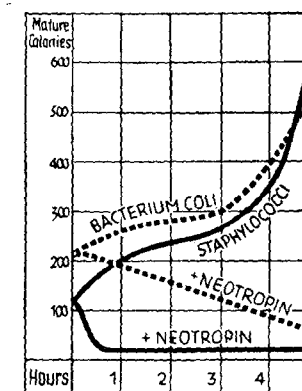
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'Health' Photo Competition No. 2

'HEALTHY MOTHER & CHILD'.

Photo Contest.

The proprietors of Health request readers of the Journal to submit photos of their healthy child and its healthy mother for the above photo competition.

This is the 2nd competition of this kind the first having been conducted in March '30. The subject was then 'healthy child within 5 years'. The present subject is "healthy mother and child" as aforesaid.

Prizes of Rs. 25, 15, and 10 with consolation prizes if necessary will be awarded to those whose photos have been adjudged as best. The competition is open to all Indians resident in India, Burma or Ceylon or Indians abroad. In the photo which may be a snap-shot or studio portrait, the child should be with the mother. No age limit is fixed to the mother but to the child it must be above 1 and below 4 years, on the date photographed. Photos should have been taken in 1932 only. Badly taken photos even of healthy mother and child will not win a prize. All photos should be good enough for reproduction and should be addressed to The Editor, 'Health' 323, Thambu Chetty Street, Madras, so as to reach them on or before 15th November '32 with a declaration given in the coupon given in the current issue of Health, English and vernaculars. Any number of photos may be submitted provided each one is accompanied by the aforesaid coupon pasted on its back.

The proprietors will have the photos, judged by competent authorities whose decision will be final. The winners' names will be published in January '33 Health. It is understood that the proprietors of Health have the right to publish the photos submitted, if they so desire.

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Estd. 1923.

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About other injections, Mercurochrome and Tr. Iodine were tried a lot with no benefit.

Lately F. W. O. Connor has suggested giving injections of Sulphars Phenamine *locally* to see if they would modify the severity and duration of attacks of lymphangitis believed to be filarial and of elephantoid fever. So far he believes they have some effect.

COMPLICATIONS IN THE RECENT EPIDEMIC OF SMALL-POX AND ITS TREATMENT*

BY

N. M. DAVE, L.C.P.S., (Bom.)

Mogal Kot, Nadiad.

There occurred an epidemic of Small-Pox in the City of Nadiad in December, 1930, January and February 1931. It was in the whole of Gujarat during this period. In October and November 1930 there were scattered cases, but it spread in full rage in January and February, and subsided in March 1931.

In Nadiad Municipality about one thousand attacks are registered in children from one to ten years, but greater number is of one to five years children. Total number of deaths is nearly four hundred of one to five years age children. Small-Pox cases among the vaccinated children were observed.

Vaccination works as a preventive against small-pox attack is not yet accepted by all medical men and fully finally settled. There are some weighty opinions condemning the idea that vaccination works as a preventive. Still it is a fact and believed by majority of medical persons that vaccination lowers the mortality from and severity of small-pox attack under ten year old patients. Frequency and force of small-pox are much influenced by vaccination.

Small-pox is a fatal disease, but it is well-known for its complications and sequelæ which it leaves behind. Patient is cripple and a victim till it is all over with him. It is an observation that in different epidemics of small-pox complications of different organs of the body are more in number and percentage. Site of election varies in each epidemic of small-pox; that is in one, eye complications are prominent, in other, bone, joints are affected mostly or skin complications. The cause of this type of site elections is not worked out.

Small-pox is a contagious specific disease, which fact was

* Specially contributed to the 'Antiseptic.'

observed by Hindus in the past. Physicians of old-Charak and Sushrut times—gave out certain rules to check its prevalence by isolation. These rules, as they have been practised and have come down from generation to generation with some addition and alteration are now customs. Though the real meaning is not understood by the masses at present, yet the established usage has become so religious that the real purpose of isolation is well served. A little enlightenment on the subject in the form of educative propaganda will infuse the true knowledge of prevention of prevalence of small-pox.

People are aware that variola is a self-terminating malady. There is no remedy which can cut short its course but much can be done to save the patient from complications arising in the convalescence period of small-pox by proper treatment. Complications are due to secondary infections absorbed mostly from the skin. If proper care is taken to keep the external part of the body clean and aseptic by antiseptic measures during the course, one can do much to prevent complications.

I had the opportunity of attending some twenty non-vaccinated children in educated families from the commencement of the attack. All the cases were of confluent type of small-pox between the age of three and seven years. I followed a fixed plan on the general principles of antiseptic method for external and internal use to avoid complications arising in variola. There was no complication in none of my cases. Even the pox mark was not seen on the skin after six months.

(1) On the first day of the initial stage bowels were moved giving Calomel or Grey Pulve in fractional doses followed by mist. alba : and pot. citras and Liq-amon. acet. with little bromide if necessary for restlessness and pain. A night dose of Urotropin daily throughout the course ordered. Doses should be according to the age of the patient.

(2) Irrigation of the bowels with tepid drinking water adding little common salt. The water used in irrigation was boiled and then allowed to cool for use. This cleaned the bowels, increased urination and worked as a little diaphoretic. This practice was adopted throughout the whole course of the disease.

(3) *Daily* at noon time, a warm bath was given. Mag. sulph one oz. and acid carbolic two drachms to each two pints of water. Body is dried after bathing by wrapping a clean dry towel; then the patient is put in the bed. Upper sheet of the bed and the sheet covering the body are changed daily and washed after putting them in boiling water. The bed and body are dusted with the powder profusely.

Powder—

R

Boric acid	1 part
Zinc oxide	$\frac{1}{4}$ "
Calci. Prep.	$\frac{1}{4}$ "
Mix. well	

When the crusting stage begins and itch commences body is smeared with oil very lightly.

R

Camphor	3p.
Eucalyp. oil	3ii
Acid carbolic	3i
Sweet oil	3i
Mix. well.	

Itching is intense in crusting stage; but it was not very troublesome in these patients. If it is necessary, hypnotic should be prescribed to prevent scratching and thus to avoid secondary infection. Mouth cleaned with P. P. Solution.

Diet: Honey in tepid water with addition of lemon juice, milk, home made Kausmiss fruits.

COMPLICATIONS.

Suppurative Arthritis:—During this epidemic of small-pox diffused suppuration in the joints was the seat of election in after convalescence period.

Cases treated:—Elbow joint five, wrist-joint, four, ankle-joint two and knee joint one. Multiple boils two cases and one case of chronic indolent ulcers.

Among these cases, one case was of Polyarthrititis, left elbow, left wrist, right and left ankle joints were affected at a time.

Why are the joints affected in small-pox? This question is yet to be solved.

In these cases pus was let out by putting incisions and dressed twice daily aseptically. Urotropine with little addition of drugs as required according to individual condition internally.

Colloidal mengane $\frac{1}{2}$ cc. and callo-Iodine one cc. alternately twice in a week were injected intramuscularly in all the cases.

Diet: Juice of orange, tomatoes, honey, milk, milk-butter etc.

In these cases, a case of knee joint suppuration was fatal. Multiple suppurative arthritis after small-pox is usually fatal; but the case of M. S. Arthritis quoted above survived.

(1) Suppurative arthritis of elbow in tropics almost always leads to stiffness of elbows and invariably is a legacy of joint small-pox. In

these joint cases callo-iodine or rectified iodine in two drops doses in milk was prescribed to be taken for three or four months continuously and movement of joints gradually resulted. In the cases treated little impairment in movements was observed; but not stiffness. Often and on instructions were given for gradual movements. In ulcers and boils cases collmeng and callo-iodine injections were given.

I saw one case of a lady aged 40 years who had Pox on the hands only. Her daughter aged 15 years was attacked with small-pox. She was pregnant. She aborted and died on the tenth or eleventh day. Mother was attending her.

Reference.—*Antiseptic* 1931—Page 379.

Cases & Comments.

A CASE OF PELLAGRA

BY

C. V. NATARAJAN, B.Sc., M.B.B.S., D.P.H.

Supdt., Public Health Laboratory, Bangalore.

No Cases of Pellagra have been reported in India.

The following case seems worthy of record.

A Vysia gentleman from Chintamani, Kolar District, aged 46, was brought to me for consultation. He was found to be behaving curiously to his wife and children, being unable to follow his avocation; of a negative attitude of mind for sometime, answering only when questioned even which was not forth-coming later, 5 to 6 loose motions a day; of good appetite but had to be goaded to take food. No sleep for the past 3 months but a slow muttering all the time which however stopped on questioning. Tendency to religious mania, fear of some one persecuting him all the time.

On examination a butterfly like distribution of skin eruption red and erythematous like dry eczema over the nose and the face on either side of the nose, the same type of eruption over the forearm and dorsum of the hand.

Heart, Lungs and Abdominal organs normal.

Nervous system—Knee jerk very much exaggerated. Babinski, ankle clonus and pupillary reflexes normal. Slight tremors of the extremities and tongue. Slight spastic gait. Temperament negative, each question had to be repeated four or five times before an answer could be obtained. Memory good, recognising faces and names.

Wassermann reaction :—Negative.

Urine :—Nil abnormal found.

Motions :—A few ascaris ova. No pathogenic organisms grown on culture.

Skin eruptions :—No common dermatomycoses seen under the Microscope in scrapings of the skin and no mycotic fungi or bacteria were grow from the scrapings of the skin on Sabouraud medium.

A provisional diagnosis of Pellagra was made from the triad of symptoms exhibited, Dermatitis and Dementia and the patient was treated for deficiency by making him eat rice husk (ಸಣ್ಣ) with sugar. Calcium salts were also administered, tomatoes, onions and fruits by mouth. The skin lesions improved remarkably quickly, the diarrhoea coming under control much later. The dementia, however, did not improve, but became worse, as time went by, and the relations took him back to his town for treatment of Witchcraft etc. Some six months later he was reported to have died.

In a personal conversation with Dr. H. W. Wade of the United States' Public Health Service who had come to Bangalore on a visit, he informed the writer, of his having formed opinion that some of the alleged cases of Leprosy admitted to the Epidemic Diseases Hospital in Bangalore were cases of unrecognised Pellagra.

A CASE OF HÆMORRHAGIC INFARCT OF THE LUNG RESULTING IN ABSCESS AND RECOVERY

BY

K. J. SHIVDASANI, L.M.S., B.M.S.

Medical Officer, Nawabshah, Sind.

K. H. Hindu male aged about 30 years came under my treatment at Shikarpur for the second time for chronic valvular disease of the heart about the beginning of November 1928.

Previous History :—Has not suffered from venereal disease. Is fond of meat but eats in moderation. Takes alcohol very moderately. About six or seven years ago suffered from an attack of articular rheumatism with apparent cure.

The present illness :—is of about 14 month's duration. It began with dyspnae on exertion and tenderness and heaviness in the right hypochondrium. Was treated for about five months by doctors and Unani hakims without any improvement, because he was treated primarily for enlargement of the liver. He came under my treatment originally about the beginning of March 1928. His case was diagnosed as valvular disease of the heart—Mitral stenosis with failing compensation. He remained under my treatment for about 3 months. The main line of treatment was large

doses of Digitalis with Sodii Salicylas and Iron as he was anæmic also. He improved considerably, the enlarged liver had disappeared under the ribs and he could walk about without dyspnae. As Shikarpur was very hot he was allowed to go to Karachi, which is a seaside-station with mild climate with instructions not to exert much and especially to avoid going up a staircase and to take Nativelles Digitalin granules as directed.

For some reason or the other he did not follow the directions with the result that compensation broke down and finding no improvement under treatment at Karachi he returned to his native place Shikarpur about the beginning of November and put himself under my treatment. At this time his condition was very serious.

Heart dilated, apex beat being two inches outside nipple, liver enlarged to a little above the navel, tender and pulsating, very severe dyspnae on slightest exertion even in bed and Orthopnae. He could not lie down at all and had to sleep in sitting posture propped up with pillows. There was slight oedema of the feet *but the lungs were remarkably clear with very little cough.*

He again improved with heroic doses of Digitalis in the form of Nativelles granules till it showed poisoning effects:—These consisted of severe pain about the navel, severe nausea and vomiting, small thready and running pulse, disappearance of the mitral murmur, paleness of face and concentration and reduction of the quantity of urine so that only a few ounces of nearly Portwine coloured urine were passed in 24 hours.—By this time the liver had nearly disappeared under the ribs and the apex beat of the heart a little inside the nipple, though not normal, and the patient could lie down in bed and in a few days was even moving about a little from one room to another.

The Digitalis poisoning symptoms came on suddenly and were very alarming but yielded in a couple of days to stoppage of Digitalis and giving of Diuretin, Pot, Iodide, Sodii Nitrite, Spt, Ammonia Aromatic etc. Soon after this one day the patient had right sided facial paralysis with some loss of speech. Fortunately this lasted only for one day and then it disappeared. It was possibly due to a very small embolism carried from the heart to the brain, though there was no pain in the head. The condition was transitory perhaps because collateral circulation was soon established, or the embolism was very small and was absorbed.

Digitalis had however to be again given, but in much smaller doses than before, because the heart and the liver began to enlarge again with resultant decompensation. The patient was doing fairly well when one day about the end of December 1928 he got suddenly very severe pain at the extreme base of the left lung in the back with severe dyspnae, cough and hæmoptysis. It was at first thought

to be pleuro-pneumonia because pleuritic rub with loss of breath sounds and diminished vocal resonance was found over an area about one inch in diameter—but against this there was no fever, and the pain was agonising and dyspnae out of all proportion to the area of the lung affected. The diagnosis of an infarct of the lung was therefore made. The pain was so severe that the patient insisted that I should either cut open the place or give him something to relieve the pain and induce sleep immediately. With an injection of $\frac{1}{2}$ gr. morphia and hot antiphlogistine thickly applied the patient got some relief by next day. But again on the third day he suddenly developed similar but much more alarming symptoms with pain on right side. This time the area affected was bigger about $2\frac{1}{2}$ " in diameter. A consultation with another doctor was held who confirmed the diagnosis of hæmorrhagic infarct of the lung but the condition was critical and the life despaired of.

Happily however, persisting with morphia injections and antiphlogistine the patient improved.

Unfortunately I had to leave the station for four days on 1-1-29 leaving the case in charge of another doctor.

On my return from leave though the patient's pain had considerably subsided, and the hæmoptysis ceased the dyspnae and cough persisted. The liver had again enlarged to the umbilicus and the apex beat of the heart 2" outside the nipple, but the mitral murmur had become so soft and indistinct that for a new examiner it would have been difficult to find out. The right base of the lung was dull, the dullness being continuous with that of the liver and extending upwards nearly upto the inferior angle of the scapula. There was loss of breath sounds and vocal resonance. I suspected pus inside but the consultant thought that these signs were due to enlargement of the liver upwards. I was not satisfied with this explanation specially because the patient had also developed temperature though it was not much, being only a degree or two above the normal and irregular and the *front of the lung was resonant and the air was entering it.* My suspicions were increased by the liver still enlarging downwards in spite of large doses of digitalis and the dullness of the lung creeping upwards and night sweats appearing. Further the right side of the chest was more bulging than the left and on coughing the lower inter-costal spaces bulged out more than on left side. This was about the middle of January, 1929.

To confirm my diagnosis on 18th January I put in a needle in the 9th intercostal space behind the posterior axillary line and discovered pus and next day with a Potain's aspirator removed 68 ounces of pus. More would have flowed out but the patient had a severe paroxysm of cough and it was thought desirable to remove the canula.

What a relief this gave the patient. The liver which was below the umbilicus went up to a finger below the ribs. The apex-beat of the heart which was two inches outside the nipple line went inside the line and the murmur had practically disappeared. Patient could now lie down—cough which was troublesome since the infarct but was nearly dry diminished—and so also the night sweats.

After a few days however the condition again began to grow worse and a further collection of pus was suspected. So a second time aspiration was done, ten days after the first and 34 ounces of much thicker pus than last time was removed. This time the evacuation appeared to be more thorough as blood appeared towards its end. After this aspiration the patient began to improve rapidly. He could lie very comfortably and slept well and had a good appetite and took food well.

He however started coughing up now pure pus, the same kind as was aspirated. This was obviously due to the abscess pointing and rupturing into the lung and the cavity was being drained through the lung.

Though the fever and night sweats had now disappeared it was not yet certain that the cavity would not again fill up and therefore the question of draining the cavity by an open operation with resection of the rib had seriously to be considered.

But after consultation with two more doctors it was decided on 7th February that there was no more pus and open operation was not needed.

The next day however on careful examination I detected a patch of dullness to the size of a rupee at the base of left lung just where the first infarct had occurred and which was expected to have been absorbed.

the dyspnae would ease and the patient be able to lie down and go off to sleep.

As the dullness at both the bases was again increasing the patient was advised to proceed to Karachi for an X-Ray examination and consultation with the Civil Surgeon, Karachi, to know if an open operation on one or both sides was necessary. It may be noted that after the second aspiration the fever had disappeared and had not returned.

Patient went to Karachi on 28-2-29. At this time the apex beat was in the nipple line and the liver $1\frac{1}{2}$ fingers below the ribs. He was advised to continue taking Digitalin granules and Manola as a tonic.

He returned after 3 or 4 days in a very much worse condition. No pus could be located by X' Rays and no operation advised. He had not taken any digitalin since he left for Karachi. On his return his condition was as follows:—

Apex beat 3" outside nipple—Liver on level with umbilicus.—anaemia plus puffiness of face—considerable oedema on legs and feet—severe dyspnae with orthopnoea—cough. Haemoptysis, insomnia and delirium at night—quantity of urine very much diminished.

The Cardiac murmur was more harsh and could be heard not only at the left base of the lung but also at the right base. This had not occurred before.

He was again put on digitalin granules big doses with other symptomatic treatment under which he very slowly improved but on 25th March symptoms of Digitalis poisoning appeared:—Exhaustion, Vomiting, very small almost imperceptible pulse 60 p.m. heart sounds muffled, murmur disappeared, apex beat could not be made out, very high coloured scanty urine. Has been perspiring more since the previous. Liver disappeared under the ribs. Digitalis stopped and stimulants containing amber and musk were administered.

From here I will quote from the notes:—

26-3-29, there is improvement all round—pulse better felt and counted 72 p.m. Heart sounds better, but murmur still cannot be heard—apex beat nipple line—cough less—no haemoptysis—quantity urine increased—edema disappearing—no delirium. Did not perspire the previous night but had perspired during the day.

30-3-29. Pulse 84—cough continues but there is again slight blood in the sputum. Complains of pain at the base of left lung which is still dull with diffuse rales—otherwise better all round.

2-4-29. No haemoptysis—muco—purulent sputum—Patient feels that the sputum is coming up from left base—perspiration and edema—disappeared—anaemia less.

9-4-29. Pulse good 80 p.m.—anaemia less—Liver one finger below ribs—apex beat nipple line—Murmur soft not traceable to bases but only to left axilla—Feels much better—went out for a drive the previous day—No cough or haemoptysis—No expectoration,

26-4-29. Been out for a drive again on 14th—can walk about a little without dyspnae—has been taking digitalis without being under regular medical observation.

Since then he has some times been better and some times worse but the bases of the lungs had cleared up and there was no cough or perspiration.

I was transferred from Shikarpur in the beginning of June and at the time I left he was in a fairly good condition. He was anxious to have a change to a cooler climate. He was advised to go to Quetta where unfortunately his heart trouble relapsed with loss of compensation. I have recently heard from him saying that his heart trouble is increasing.

Discussion :—(1) An infarct of the lung is a very rare occurrence; during my practice of 17 years, this is the first case I have seen. Recovery from the same specially after suppuration is rarer still.

(2) The large quantity of pus 68 ounces apart from its mechanical effects caused very little general disturbance perhaps it was aseptic.

(3) The large abscess cavity healed with only three aspirations of its contents.

(4) Action of Digitalis in the form of Nativelles granules in this case has been very interesting. It has showed its good effect after poisonous doses causing temporary alarming symptoms. The doses used far exceeded those suggested by the manufacturers. It may be mentioned that when digitalin was suspended onbaine arnaud was given.

(5) It is possible the strong action of the degtails was instrumental in detaching, a bit of growth resulting in embolism infarct of the lung.

(6) An interesting point is that during the whole illness, apart from infarct of the lung, the latter remained remarkably clear, the brunt of the backward pressure being borne by the liver. I have seen some cases in which the lungs come in for most of the trouble of backward pressure with troublesome cough and mucoid sputum and yet others where edema of the lower extremities is the most prominent symptom.

(7) It is possible there was again a small collection of pus on the left side which could not be located but which was coughed up. See notes above on 2-4-29.

A CASE OF SENILE GANGRENE OF THE SKIN FOLLOWING OPERATIONS.

BY

M. K. SAMBASIVAN, M.B.B.S.,

Kumbakonam.

H. P. aged, 56, was admitted into my hospital on 21-6-32 with an irregular ulcer in the anterior abdominal wall, over the right iliac region.

Previous History.—The patient had pain in the right iliac region, which later turned out to be an abscess which was opened by a compounder. After 8 days, the size of the wound began to increase, the ulceration spreading from the site of operation. All sorts of dressings were tried but the ulceration was progressing with amazing rapidity.

Condition on admission.—An emaciated old man, with no Pyorrhoea; Heart and lungs—normal; Urine—no sugar or albumen; B. P.—Normal. Temp—99 degrees.

Local Condition.—The ulcer was about 3" by 2", irregular in outline and very tender. The central portion was red and clean. Periphery consisted of 3/4" of slough. The skin beyond this slough was indurated carbuncular-like. The ulceration affected only the skin and subcutaneous tissues.

Treatment.—For the first few days nothing was done, excepting frequent change of dressings, after hot fomentations. But the patient could not tolerate heat. Various antiseptic dressings were tried. But they were of little use and the ulcer was spreading rapidly. Then, the sloughing margins were removed under anesthesia and 4th hourly Eusol dressings were applied. The progress could not be arrested. In about 7 days the wound became 10" by 6". Then I cauterised the ulcer with the Diathermy knife going well beyond the red margin into the sound skin and burning the gutter down to the subcutaneous tissues. The middle was left untouched.

This stopped all further extension of the ulcer and in a weeks' time, the margins cleared up and the wound showed signs of healing.

The patient was discharged from the in-patient dept., on 17-7-32.

X-RAY THERAPY IN ERYSEPELAS.

BY

M. K. SAMBASIVAN, M.B.B.S.

Kumbakonam.

N. P. aged 54 years was admitted on 21-6-32, for Alveolar abscess. Urine was free from Sugar and Albumen.

The abscess was incised and two molar teeth were removed, as they were loose. The patient was kept in bed and antiseptic mouth washes were given fourth hourly. He was doing well till 25-6-32 when he developed a rigor and the temperature shot up to 104° which was maintained till 26th. Blood examination showed no microfilaria or malaria. There was slight leucocytosis.

26-6-32. Towards the evening the left side of the face was swollen and very painful. Since the patient was of dark complexion no definite margin could be discerned.

27-6-32. The swelling was more definite and began to extend towards the nose which was also swollen. There was difficulty in swallowing. The condition was diagnosed as Facial Erysipelas and the painful areas were painted with Tr. Ferri. Perchlor. He was given Mist. Triple Sulphas by mouth and 20 cc. of Anti-Erysipelas serum in the abdominal wall. Temp. varied between 103°—104°.

28-6-32. The right side was affected. There was considerable difficulty in swallowing. Patient was restless and at times delirious. Complained of severe pain in the head and face. 20 cc. serum was repeated and at night he was given 1 cc. Omnopon. He had fairly good sleep.

29-6-32. The swelling was more prominent and his whole face and lips were one big mass. Blebs had formed on the lobe of the left ear. The parotid and sub-maxillary glands were enlarged and tender. Severe nausea. Temp. between 103°—105°. The serum was repeated.

30-6-32. The face was exposed to a small dose of X-rays.

1-7-32. The temp. in the morning came down to 99°. The swelling was considerably reduced, pain was less and the patient was able to take some food.

2-7-32. The swelling had disappeared and temp. was normal.

6-7-32. Patient was discharged cured.

AN INTERESTING CASE OF STAB WOUNDS OF THE ABDOMEN.

BY

CAPT. M. A. HUSSAIN, M.B.B.S., P.C.M., Assistant Surgeon,

K. E. M. Hospital, Karnal, Punjab.

Kanhaya aged 35 years, Hindu male, resident Karnal District, Punjab was admitted to the K. E. M. Hospital, Karnal on 21-3-32. with two stab wounds of the abdomen:

1. One on the front aspect of the abdomen just below the xiphoid cartilage, 2" long $\frac{1}{2}$ " wide and 6" deep running backwards, upwards and to the left.

2. The other incised stab wound was situated on the left side of the back in its lower part just below the region of the left kidney. 1" long $\frac{1}{2}$ " wide and 3" deep.

On admission the wounds were found stuffed with burnt silk, a favourite indigenous remedy for stopping hæmorrhage. This packing was removed with considerable difficulty and the wounds were as thoroughly cleansed as possible. They were then sutured with interrupted silk worm gut sutures. For the first four or five days after the admission the patient's general condition continued to be so good that it seemed the wounds were healing by first intention. On the seventh day there was a sharp rise of temperature and on changing the dressings it was found that some of the stitches in both the wounds had given way. There was profuse discharge of very foul smelling pus from the wound in the epigastrium. On removing the remaining stitches about a pint of this discharge came out under pressure from the front wound. The discharge from the wound on the back was similar in character but was not so profuse. On irrigating the front wound it was very surprising to note that the irrigating fluid was coming out from the wound on the back. After a few days watching the patient was put under chloroform, both the wounds were enlarged and carefully explored but no direct communication could be established between the two wounds. Long drainage tubes with thin calibres were introduced in the wounds to facilitate drainage. The irrigating fluid after the operation upto the time of writing comes out from the wound on the back when put in from the front wound more or less regularly except for an occasional interval of a few days when it stops with the result that the temperature rises up and the discharge is pent up. The amount of discharge is variable. The general condition of the patient is not too bad except for the effects of prolonged suppuration in the way of emaciation and hectic temperature. He sleeps and eats well.

Point of interest—The way in which the two wounds communicate is rather interesting. It is either through the abdominal parietes with a very sinuous course or through the abdominal cavity with a tract formed through the peritoneum resulting from extensive localised peritonitis with no immediate untowards and serious effects such as acute general peritonitis.

A CASE OF HERNIA TREATMENT BY INJECTION OF ATROPINE.

BY

DR. N. C. DUTTA,

Burmacherra T. E. Kujuricherra, P. O., S. Sylhet.

Having read the results of success in treatment of hernia by injections of atropine I took the first opportunity of trying this method, and the following are the particulars of my case,—

The patient was a Mohammedan male over 50 years of age and he had a right inguinal hernia about the size of a large egg. He had been treated by other medical men without success, and as I could not reduce the hernia by the ordinary methods I decided to try atropine. I injected subcutaneously 1/100 grain of atropine sulphate, and after about thirty minutes the hernia was easily reduced, and the patient rose from bed greatly relieved.

I was rather astonished at the quick result, and recommend other medical men to give the method a trial, and publish their results. Although this is not a cure for hernia, and operation will be required in many cases, it is very useful at times.

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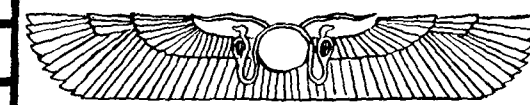
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be of five years' duration. For the present there may be two standards of qualification one being the University degree and the other a diploma which will entitle the holders to registration in the Madras Medical Register. The lower standard of qualification should be raised as soon as possible with a view to attaining the ideal of a uniform high standard of training with a single high minimum standard of qualification. The University degree which is controlled by the University authorities has not come under the consideration of the Committee but it is recommended that the diploma be granted by a licensing body which should control the examination, curriculum and instruction for the Diploma. The Committee recommends that the prescribed minimum standard of preliminary education should be the University entrance examination with Science as the optional group, this standard should not be lowered because of a paucity of candidates or any other consideration. The committee recommends that the selection of students should be purely on merit and should not be on any communal basis.....Students of the Medical Colleges should be allowed to appear for the examination for the diploma so that those who fail in the University examinations may have an opportunity of obtaining a qualification. These holders of the diploma who possess the minimum educational qualification which is prescribed for admission to the Medical Colleges should be eligible for recruitment to Government Service on the same terms as the University Graduates".

2. Since the above recommendations were made, an event had occurred which must be considered as a serious menace to the dense darkness that is enveloping the L.M.P. horizon. The first is the resolution of Dr. M. R. Gurusami Mudaliar brought before the Academic Council of the University of Madras on 14th March '31 providing for L.M.P. diploma holders to qualify themselves for M.B.B.S. degree under certain conditions. While it aims at levelling the existing inequalities in the Medical Profession, there is no denying the fact that the obstacles thrown in the way of the L.M.Ps gaining their end have been rendered too formidable to be easily overcome. We mean the condition requiring the L.M.P. diploma-holders to pass the Intermediate Examination in Arts or an examination accepted by the Syndicate as equivalent thereto. This preliminary qualification is in our opinion unnecessary, as the L.M.P.s must have already picked up sufficient general knowledge in the English language, during their five years and more of practice of their profession and have had sufficient grounding in Science, while reading in the Medical School for the L.M.P. course. It is indeed a ridiculous waste of time and energy to force the L.M.Ps to pass the Intermediate Examination or Cambridge Senior with credit

in three subjects, as the Syndicate we understand, now require them to do, as being equivalent to Intermediate in Arts. The fate of a few unfortunate L.M.Ps is now hanging in the balance, because having passed the Cambridge Senior, they were unable to secure credit in three subjects. The Syndicate would have acted wisely if they had only ruled that L.M.Ps desirous of studying for the M.B.B.S. Course, should sit for the English paper alone in the Intermediate Examination exempting them from the rest or pass an entrance examination in English, Physics, Chemistry and Biology and exempt them from Vernacular and other subjects which are obviously not wanted for their purpose. Thus, this resolution is destined to be a dead letter as the L. M. Ps who can run this obstacle race will only be few and far between. The next event alluded to above refers to the Chief Minister recently agreeing to raise the percentage of marks obtainable by the final year L. M. P. students to 50%. This is undoubtedly a step in the right direction as the L. M. P. will no longer be branded as inferior to M.B.B.S., his efficiency in the subjects which are common to both, being equal and not below the minimum prescribed for the latter.

3. There remains now the raising of the course of the L. M. P. from 4 to 5 years. There is no valid reason for the Govt. to sleep over this matter, after the unequivocal and unanimous recommendation of the Medical Education Committee. The Medical and lay public have already sufficiently expressed themselves in favour of this measure and the Govt. can no longer take shelter under the plea that 'public opinion is wanting in this respect'. The Committee has further recommended that a diploma be granted by a licensing body which control the examination, curriculum and instruction for the diploma. The establishment of a Statutory body in Madras like the Royal College of Physicians and Surgeons in the United Kingdom, has thus become imperative. As matters stand at present, medical education is in the hands of the Minister, whose sole adviser is the Surgeon-General. The democratization of Medical Education being the cry of the hour, the transfer of control from the Minister of Medicine to a body of Medical Men is an essential reform which must not be delayed a moment longer. A College of Physicians and Surgeons exists in Bombay but it is not a statutory body but a Society registered under the Companies Act functioning at the direction and dictation of the Government. If we remember a right some two or three years ago, the College of Physicians and Surgeons in Bombay resolved to raise the Licentiate course to five years but their proposal was knocked on the head by the Govt. The Provincial Governments in India with no exception whatever, are generally opposed to raising the course and standard of qualifications of L.M.Ps. But they cannot continue

long in this state of indifference if not defiance to public opinion. A College of Physicians and Surgeons should immediately be established in Madras with, say, 30 members consisting of the pick of the Medical Profession in the Presidency, the non-official element preponderating. They must have statutory powers vested in them, like the University and other bodies. The existing medical schools in the city may with suitable modifications be utilized for imparting the necessary instruction, the Mofussil Medical Schools being affiliated to this institution. The syllabus should be so arranged as to conform to the standard and requirements of the General Medical Council of Great Britain or the All India Medical Council, when it comes into being. The College will conduct examinations and award diplomas. There may be three diplomas, the Fellowship (F.C.P. & S.), Membership (M.C.P. & S.) and Licentiatehip (L.C.P. & S.). The course of instruction should be raised to five years. Then there will be only two classes of Medical men, those who come out of the University, obtaining degrees such as M.B.B.S. and M.D. and those who are awarded diplomas by the College of Physicians and Surgeons. Both will have the same training, same examinations to undergo, possess the same qualifications, only, they come through different doors. Here efficiency is not sacrificed at the altar of cheapness. As regards entertainment in Government Service and conferring of Honorary appointments, no distinction whatever should be made between University Candidates and Diploma Holders. The candidates for Provincial Medical Service should be selected on competitive basis. This will do away with the baneful caste system now prevalent in the services. As the Committee on Medical Education has also expressed itself strongly in favour of the above proposal, the Government cannot afford to shirk their responsibility in the matter. Financial and other considerations need not deter the Government from giving effect to this proposal. With the existing allotment for Medical Schools and the collaboration of Independent Medical men as honorary workers, both as teachers and as hospital staff, no great financial strain need be felt.

We trust the lay public and the Medical Profession in Madras will lend their hearty support to the above scheme and force the hands of the Government and the Legislature to launch it at no distant date.

Gleanings from Medical Press

SURGERY.

Diagnosis of Malignant Prostate.—The differential diagnosis between carcinoma of the prostate and other lesions affecting that gland is occasionally very difficult. An area of induration in an innocent prostate, or a deeply embedded prostatic calculus, may easily be taken for a malignant focus, and much unnecessary anxiety will result from the error. For this reason Dr. S. W. Mulholland's "Study of prostatic secretion—its relation to malignancy" is of great importance to the clinician. His paper is given in the *Proceedings of the Staff Meetings of the Mayo Clinic* for December 16th, 1931. Dr. Mulholland introduces his subject by stating that Widal, Zemanski and Quincke have already called attention to the fact that cellular elements are found in secretions accompanying malignancy, such as pleural and ascitic fluids. Investigation of these effusions has shown that when they are the result of malignant diseases they contain a large number of endothelial-like cells, which usually occur in clumps. On the assumption that carcinoma of the prostate would occasion an alteration in the cellular content of the Prostatic secretion, he studied a number of cases of malignant disease and compared the cellular count with that found in such lesions as prostatitis and old-age enlargements. For the purpose of classification he graded cases of prostatitis into four classes, depending on the number of leucocytes noted in a low-power microscopical field. By this method of grading, a prostate was considered normal when there were fewer than five cells per field. In Grade 1 prostatitis there were five to ten cells per field, in grade 2 ten to fifty, in Grade 3 fifty to a hundred and in grade 4 more than a hundred cells. It was shown by staining that 90 per cent. or more of the leucocytes were polymorphonuclears. Lymphocytes formed a much larger proportion of the cells in secretion from normal prostate glands or from cases of very mild prostatitis. Smears were then taken from the prostatic secretion of thirty patients who were known to be suffering from carcinoma of the prostate. These smears were stained with Wright's stain and examined in the same way as the others. It was immediately noted that the type of cell present was different from that found in a normal prostate or in cases of prostatitis. The commonest element was about two or three times the size of an ordinary polymorphonuclear leucocyte; it tended to occur in clumps, its form suggesting that the cells had been packed together so that their outlines had undergone distortion. The nucleus in a well stained section was acidophile, and contrasted

with the basophil staining of the polymorphonuclear cells. The nucleus was round centrally situated and bore a relation of 1 or 2 or 1 to 3 to the remainder of the cell. There was also a tendency for the nucleus to contain a coarsely reticular chromatin material and many times it was studded with small vacuoles. The cytoplasm was in most cases clear, and often had the appearance of ground glass. Both small and large vacuoles were noted throughout the cytoplasm of some of the cells. It was only in cases of malignancy associated with infection that these cells were not present or could only be found with great difficulty. Infection appeared to mask the clinical picture. Although Dr. Mulholland's findings have not yet been confirmed by other workers, and must therefore be regarded as tentative, it would appear that in a cellular count we have a valuable aid to differential diagnosis. It is only in doubtful cases that this aid will be required, but such cases are numerous enough to confer importance on Dr. Mulholland's investigation.—*B. M. J. January 30, 1932.*

The Functions of the Tonsils.—In spite of much research, little is definitely known about the functions of the tonsils. L. B. Seiforth, of Cologne, has recently reviewed at length modern knowledge of the subject, and a perusal of his essay emphasises the sanctity of this knowledge. He discusses the possible functions of the tonsils under the headings of lymphocyte formation, defensive function, defensive and internal secretion, and he concludes that the only function which has been proved with certainty is the production of lymphocytes. This function the tonsils share with all the lymph glands of the body, and their extirpation cannot therefore, from this point of view, do much to alter the general bodily constitution. In addition there are good grounds for believing that the tonsils play an important part in the defensive mechanism of the body, and Seiforth believes that the involution of the tonsils at puberty may be connected with the fact that by this time a satisfactory degree of immunity has been achieved. Experiments directed to prove an internal secretion have so far been so contradictory as to be quite inconclusive. Seiforth holds that the theoretical problem can have at present but little influence, on the practical one of clinical treatment, which, may, in his opinion, be summed up in the two words "chronic tonsillitis"; but the diagnosis of this chronic tonsillitis, and therefore the indications for operation, have not so far been greatly influenced by physiological considerations. The practical side of the tonsil problem is dealt with very directly in a letter of insertion sent to school physicians by the Department of School Hygiene of the City of Boston in the hope that such carefully formulated rules should tend to bring

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the school and family physicians into better accord. According to these rules the school physician should recommend tonsillectomy and adenoidectomy only:—

1. If the child gives a history of repeated attacks of acute tonsillitis or quinsy sore throat;
2. If the child has suffered from continuous cold;
3. If the cervical glands are definitely enlarged and have suffered from acute inflammation;
4. If the child has obstructive nasal breathing (adenoids);
5. If the child has suffered from an attack of acute catarrhal or suppurative otitis media;
6. If the child is mouth breather;
7. If the child gives a history of repeated attacks of pharyngitis, laryngitis, or bronchitis;
8. If the tonsils obstruct the fauces, making the swallowing of food difficult;
9. If the child gives a history of Rheumatism, chorea, endocarditis, or nephritis.
10. If there is evidence of continuous discharge from the nose not caused by sinusitis or antrum disease;
11. If the tonsil is buried and therefore objectively not visible as a large structure but shows definite evidence of a diseased condition.

It does not, however, appear to follow that the operation must be advised in all children falling into any of these groups. Nos. 4 and 6 seem to be synonymous, and it should be remembered that there are other causes of nasal obstruction in children; No. 11 appears to beg the question, for removal may be advisable when a tonsil "shows evidence of a diseased condition" whether it is or not buried. On the whole, these rules should achieve the purpose for which they have been framed; but truly the "tonsil problem" is too difficult to be solved within so rigid a frame.—*The Lancet*, April 9th, 1932.

MEDICINE AND THERAPEUTICS.

* **Clinical Report on a Urinary Antiseptic.**—Carl Rusche, M. D. After discussing the causation of urinary infections and the problem of urinary antiseptics in general, the author describes his experiences with a new urinary antiseptic, 'Niazo' (known outside America as 'Neotropin').

This is an azo-pyridin dyestuff which passes through the gastrointestinal tract and blood stream and is excreted mainly in the urine thus rendering the latter an unfit culture medium for bacteria.

* *The American Journal of Surgery*.
New Series Vol. XV, No. 3, p. 545-547,

The drug is well tolerated and was given in doses of 2 dragees 3 times a day after meals. The limitation of fluid intake to 1500 cc. is recommended. The author states:

"Most patients report after twenty-four hours a lessening in bladder spasm and note a soothing effect or decrease in urethral burning. Freeing urine of pus and bacteria varied greatly. We have found 'Niazo' (Neotropin) of greatest advantage in the acute fulminating, posterior gonorrhœal infections. Large doses over a period of several days with hot Sitz baths give the patients more benefit than anything we have tried so far.

In all cases studied except those with acute urethral symptoms, a complete physical and urological examination was made to rule out or correct all urinary tract abnormalities.

*Table I shows what was accomplished in 70 cases in which Niazo (Neotropin) was administered orally. In this chart practically every type of urinary infection is represented that the practitioner meets with in daily practice.

Judging from the table there was improvement, considered satisfactory in about 87 per cent. of patients receiving the drug. The prompt effect of Niazo (Neotropin) on bacteria, especially cocci, was surprising. It was in gonococcal infections that Niazo (Neotropin) seems to have a real selective action."

Dr. Rusche suggests that the introduction of chemo-therapeutic dye preparations heralds a new era in urinary antiseptics and recommends the study of these products to the attention of practitioners.

Intraspinal Magnesium Sulphate for Intolerable Pain.—A Gordon advocates intraspinal injections of magnesium sulphate for the relief of intolerable pain, and records satisfactory results in twelve cases (four of tabes, seven of radiculitis, and one of fibroblastoma of the cord). Based upon sound physiological deductions and experimentation, it is claimed that in certain cases of root pain, due to organic involvement of the central nervous system, relief can be obtained and existence rendered tolerable thereby. Success depends largely upon wise discrimination as to dosage, frequency, and length of intervals in treatment. The minimum adult dose is 2 c.cm. of a 25 per cent. solution of magnesium sulphate, but in long-standing cases, when the patients are exhausted by pain and want of sleep, 4 c.cm. may be given. The spinal puncture should be below the second lumbar vertebra, preferably between the third and fourth or the fourth and fifth vertebræ. Immediately following the withdrawal of 5 c.cm. of spinal fluid, the solution should be introduced while the needle is in position; the patient is kept quiet in bed for several hours in a lateral position. Even in cases where a dry tap results,

* Not received for publication.

owing to blocking of the subarachnoid space, the injection should still be made. In one of the author's cases considerable relief was obtained though several dry punctures were made. In all the cases prior to the trial of the intraspinal method sedatives had failed to give any relief. One tabetic patient was completely relieved of severe lumbar pain and girdle sensation after three 2 c.cm. injections at weekly intervals, and the pain in the legs became better. There was also noticeable improvement in gait, ataxia, and bladder control.—*Med. J. & Rec.*, April 15, 1931, p. 399.—*Can. Med. Ass. Jnl.*

Digitalis as a Cause of Anginal Pain.—G. K. Fenn, and N. C. Gilbert (*Journ. Amer. Med. Assn.*, Jan. 9th, 1932, P. 99) believe that digitalis may be responsible for the appearance of angina in many cases in which this drug is being administered to restore cardiac compensation, but are unable to estimate the relative frequency of such an occurrence. In view of their observations they now rarely use digitalis in angina, and never early in coronary thrombosis; they consider that there has been a consequent fall in the incidence of angina symptoms. They cite seven of the cases which led them to this view, and discuss the possible aetiology. Animal experiments showed that digitalis reduced the coronary flow to an extent which could not be explained by changes in the pulse rate. Constriction of the coronary arteries was manifest in some but not in all cases. The authors do not suggest that digitalis is definitely contra-indicated in angina; they used tinctures and not the whole-leaf preparations, and agree that it is difficult to assay satisfactorily and comparatively the relative values of the various forms of this alkaloid. They maintain however, that in some cases of cardiac disease the exhibition of digitalis is only of doubtful value, and that in such cases the existence of a tendency to excite or intensify anginal pains should be remembered.—*Brit. Med. Journal*, 9th April, 1932.

Correspondence.

Dear Sir,

Will you kindly publish the following letter in the next issue of the 'Antiseptic' and be good enough to accord your own advice in the matter for which I shall feel extremely obliged.

My little nephew—my brother's only child—16 months of age—suffered from a septic sore throat with a greyish film of exudate on both tonsils invading the adjacent parts of the faucial pillars and the soft palate as in a case of Vincent's angina—the process being shallow necrosis rather than a true membrane formation—wi-

glandular swelling in the neck, fever ranging from 100 to 102, dyspnæa and stertorous breathing.

As it was not possible to make a bacteriological examination for the large fusiform bacilli and sperilla described by Vincent or per Klebo—La'ffler bacillus treated the child with Diphtheria antitoxin, giving him 2,000 units at once. 24 hours later finding no tangible improvement in the case I gave the child 5 c.c. of Antistreptococcus Serum of Bengal Immunity Company. As this was followed by a remarkable amelioration in the condition of the little patient. I was encouraged to repeat the Injection and gave another dose of 5 c.c. the following day. By this time the patels in the throat had almost disappeared leaving a red congested surface which bled a little when touched with swabs of antiseptic applications. Finally I gave the child one more injection of Diphtheria antitoxin 2000 units as a safeguard against a possibility of Diphtheritic inflammation.

Internally the child was given a mixture of :-

Quinine Hydrochlor	gr. iii	
Tr. Ferri Perch.	m. x	
Pot. chloras	gr. vi	3 doses
Glycerine	3i	3ii Tid
Aqua ad	3vi	

He was placed in a Steam tent—the Steam being charged with Tr. Benzoin Co. Eucalyptus and Acid Carbolic and the neck was covered with Antiphlogistine and the throat touched with saturated solution of Acid Boric with a few minims of Acid Carbolic and Tr. Iodine Rect added to it.

The patient is quite well now to all appearances. Throughout his illness and ever since he has been on barley water and milk and glucose. He is however suffering from paroxysmal cough and Voicelessness (Hoarseness). He has lost his voice altogether and even his crying is not audible. He is able to articulate words for he sometimes whispers but *Ba Ba* this only in a whispering tone. He is not old enough to suck voice lozenges or gargle the throat. I gave him the following :-

Pot. chloras	gr. vi	And later :-	
Ammon Benzoas	gr. vi	Pots. Chloras	gr. vi
Bromide	gr. vi	Vin. Ipecac	m. x
Tr. Belladonna	m. vi	Tr. Camphor co m.	x
Vin. Ipecac	m. x	Ext. glycyr liq. m.	x
Ext. glycyr. liq.	m. xv	Syrup Tolu	3 j.
Spt. Chloroform	m. x	Ammon. Chloride	gr. iv
Syrup. Tolu	3 p.	Aqua anisi	3 vi
Aqua anisi ad	3 vi		

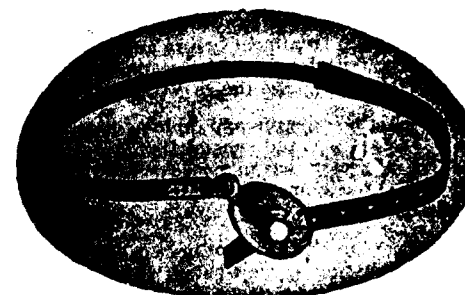
but no relief marked so far as his huskiness is concerned.

1932]

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I am, yours fraternally,

AHUJA TAHILRAM DASLOMAL,

Registered Medical Practitioner, Tharushah (Sind).

INDIAN MEDICAL COUNCIL BILL.

[The following amendments have been tabled by Mr. M. Maswood M. L. A. for being moved in the Legislative Assembly at its Simla Session in September '32, when the further stages of the Indian Medical Council Bill will be proceeded with. We invite the opinion of our readers on the various amendments proposed herein in time for publication in the Sept. '32 issue—Ed. Antiseptic.]

Legislative Assembly.

Notice of Amendments.

INDIAN MEDICAL COUNCIL BILL.

(To be moved at the Meeting of the Legislative Assembly to be held on Sept. '32 after the motion that the bill be taken into consideration).

1. That the bill be circulated for the purpose of eliciting opinion thereon by the 31st Dec. 1932.

(If the amendment mentioned above fails). That the bill to establish a Medical Council in India and to provide for the maintenance of a British Indian Medical Register be referred to a select committee consisting of (Names of the members of the select committee will be mentioned at time of moving the amendment) and that the number of members whose presence shall be necessary to constitute a meeting of the committee shall be five.

2. That for the Preamble the following preamble be substituted:—

"Whereas it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioner and so to provide for the maintenance of a Register of qualified practitioner of modern scientific medicine in order to establish a uniform minimum standard of qualification in Medicine for all pro-

vinces such that persons attaining thereto shall be acceptable as Medical practitioners through-out India; it is hereby enacted as follows :—

(If the amendment mentioned above fails).

That for the preamble the following preamble be substituted "Whereas it is expedient that persons requiring Medical aid should be enabled to distinguish qualified from unqualified practitioners; it is hereby enacted as follows :—

(If the amendment mentioned above fails).

That for the preamble the following preamble be substituted :—

"Whereas it is expedient to establish a Medical Council in India and to provide for the maintenance of a Register of qualified practitioners of modern scientific medicine in order to establish a uniform minimum standard of qualifications in India for all Provinces such that persons attaining thereto shall be acceptable as Medical practitioners throughout British India; it is hereby enacted as follows :—

(If the amendment mentioned above fails).

In the preamble the words "Higher grade of" before the words qualified and "Higher" before the word qualifications, be deleted.

3. In sub clause (g) of sub clause (2) omit the word "British".

4. The sub clause (a) of sub clause (1) of clause 3 be omitted.

(If the above mentioned amendment fails).

In the end of sub clause (a) of clause (1) of clause 3 the following words be inserted "for the first five years and then shall be elected by the members of the Council from amongst themselves".

5. Omit the sub clause (b) of sub clause (1) of clause 3.

(If the above mentioned amendment fails)

In the end of sub clause (b) of sub clause (1) of clause 3 the following be added :—

"In order to represent the minority community of the Province or to represent any special interest if unrepresented by the Provincial elections"

6. For the sub clause (c) of sub clause (1) of clause 3 the following be substituted :—

One member to be elected by the members of the Senate or of the University Court of an Indian University having Medical Faculty from amongst the members of the Medical Faculty of that University".

7. For the sub clause (d) of sub clause (1) of clause 3 the following be substituted :—

"One member from each Province in which a Provincial Medical Register is maintained, elected from amongst themselves by

persons enrolled on such Register who hold qualifications in medicine granted or recognised by any Indian University or by any other Medical Institution which the Governor General in Council may specify in this behalf".

(If the above mentioned amendment fails)

In sub clause (d) of sub clause (1) of clause 3 before the word "members" insert the word "elected",

8. The following new sub clause to sub clause (1) of clause 3 be inserted :—

"One member from each province in which a provincial Medical Register is maintained, elected from amongst themselves by Licentiate registered on such Register"

9. The following new sub clause to sub clause (1) of clause 3 be inserted :—

"Nine members to be elected by members of the Legislative Assembly by means of single transferable votes".

10. The following new sub clause (4) be added in clause 3 :—

"The President of the Council shall be elected by the members of the Council from amongst themselves."

11. Clause 4 sub clause (1) be redrafted in the light of the amendments to clause 3 (consequential amendment will be moved at the time of discussing clause 4.

12. In the end of the sub clause (1) of clause 5 the following be added.

"Or on the provincial medical registers".

13. Consequential amendment to sub clause (2) of clause 5 will be moved at the time of discussion.

14. For the clause 7 sub clause 1 the following be substituted :—

"Every member including the President, shall hold office for the term of five years from the date of his nomination or election as members or until his successor shall have been duly nominated, or elected whichever is longer. In the case of a vacancy arising in the council, such vacancy shall be filled by the election or nomination as the case may be within 30 days of such vacancy occurring. A member or President so filling up a vacancy shall hold office up to the end of the term of the original member"

(If above mentioned amendment fails)

For clause 7 sub clause 1 the following be substituted —

(1). (a) A member, other than a nominated President, shall hold office for the term of five years from the date of his nomination or election, or until his successor shall have been duly nominated or elected, whichever is longer.

- (b) The first nominated president shall hold office for the term of three years from the date of his nomination or until his successor shall have been duly elected, whichever is longer.
- (c) An elected president shall hold office for a term not exceeding five years and not extending beyond the expiry of the term for which he has been nominated or elected a member of the council.
15. In clause 10 sub clause (1) for the word "seven" the word nine for the word "five" the word seven be substituted.
16. For clause 11 sub clause 1 the following be substituted :—
- 1 (a) "In any province in which a Provincial Medical Council is constituted, the members of the Provincial Medical Council shall form Provincial committee of the Council of that Province for three years.
- (b) The succeeding Provincial committee shall consist of the following members :—
1. Two members to be nominated by the Legislative Council of the Province.
 2. Two members to be elected from amongst the Medical Faculty of the University of the Province by the Senate of the University.
 3. Two members to be elected from amongst themselves by the Registered Medical practitioners of that Province.
 4. Two members to be elected by the licentiates registered on the provincial register from among themselves.
 5. Two members to be nominated by the Governor in Council of that Province.
 6. One member to be elected by the Council.
- (If the above mentioned amendment fails)
- In clause 11 sub clause (1) the words "who possess recognised Medical qualification" be omitted.
17. Add new subclause 4 after sub-clause 3 of clause 11. "The President of the Provincial Committee shall be elected by the members of the Council from amongst themselves.
18. In clause 12 omit the word "British".
19. For sub clause 2 of clause 18 the following be substituted.
- 'A medical institution in India which grants medical qualification not included in the first Schedule may apply to the Secretary of the Provincial Committee of the province in which the institution is situated (and in a province where no such committee is so formed, to the Registrar) who shall, after making such enquiries as the provincial Committees, or in the case of the province with no Committee, as the Council may direct, forward the same to the Registrar of the Council with the remarks of the Provincial Committee concerned. The Council, if it thinks fit, will recommend the recognition of the said Medical institution to the Governor-General

in Council and the Governor-General-in-Council may by notification in the Gazette of India amend the First Schedule so as to include such qualifications therein.

(If the above mentioned amendment fails.)

In sub clause 2 of clause 18 the following words be deleted :—

(a) "Governor-General-in" from 3rd and 4th lines.

(b) "The Governor-General-in-Council, after consulting" from 5th and 6th lines.

20. For clause 19 sub clause 1 the following be substituted :—

"The medical qualifications now granted by medical institutions in countries outside India shall be declared recognised medical qualifications under the Act, as soon as the Governor-General-in-Council is satisfied on the report of the Indian Medical Council that the registering authorities of such countries are prepared to enter into schemes of reciprocity, as regards enrolment and registration of Medical practitioners, with the Indian Medical Council. A list of such medical qualifications shall, by notification in the Gazette of India be included in the second schedule. Such notification may also direct that an entry shall be made in the Second Schedule, declaring that such be a recognised medical qualification only when granted after a specified date.

21. In sub clause 1 of clause 21 for the word Executive" Committee the word "Council" be substituted.

22. In sub clause 2 of clause 21 before the word "Executive Committee" in the second place the words "Council or" be added.

23. In sub clause 3 of clause 21 for the words "Governor-General-in-Council" the words "Council; The Council shall, after considering such reports send then to the Governor-General-in-Council with its recommendation" be substituted.

(If the above mentioned amendment fails)

In sub clause 3 of clause 21 the word "Governor-General-in" be deleted.

24. In sub clause 2 and 3 of clause 22 for the words "Local Government" the word "University" concerned be substituted, wherever it appears.

25. The following new clause 22 A be added. Notwithstanding anything contained in any enactment, rule, regulation, bye-law, or order to the contrary.

(1) After the enactment of this Act, the expression 'legally Privileges of registered person. qualified Medical Practitioners' or 'duly qualified Medical practitioner' or any expression importing a person recognised by law as a medical practitioner or member of the medical profession, shall when used in any Acts of the Central or Provincial Legislatures mean a medical practitioner registered under this Act.

(2) No certificate required by any Act, now in force or that may hereafter be passed from any medical practitioner or medical officer shall be valid unless the person signing the same shall have been registered under this Act.

(3) After enactment of this Act, no person shall hold any appointment as Physician, Surgeon or other Medical Officer in the Civil, Military Naval, or Air Force Services in India or any Dispensary or Hospital or Lying-in-Hospital or Infirmary not supported entirely by voluntary contributions, or any public establishment, body or institution or as a Medical Officer of Health unless he be registered under this Act.

26. A new sub clause to sub clause (1) clause 23 be added.

(k) Providing for penalties to be imposed.

27. Omit the word "British" from the first Schedule.

28. Add the following in the end of the First Schedule :—

(a) Patna University Bachelor of Medicine (M.B.) and Bachelor of Surgery (B.S.) Doctor of Medicine (M.D.) Master of Surgery (M.S.)

(b) Andhra University Bachelor of Medicine (M.B.) and Bachelor of Surgery (B.S.)

29. Add the following Third Schedule in the end.

Recognised qualifications and certificates other than those mentioned in the First and Second Schedules.

(1) Fellow, Member and Licentiate of the College of Physicians and Surgeons of Bombay.

Fellow, Member and Licentiate of the State Medical Faculty of Bengal.

Fellow, Member and Licentiate of the State Medical Faculty of the Punjab.

Licentiate and Apothecary of the Board of Examiners Medical College, Madras.

Licentiate of the State Board of Medical Examinations, U.P.

Licentiate of the Behar & Orissa Medical Examination Board.

Licentiate of Central Provinces Medical Examination Board.

Licentiate of the Assam Medical Examination Board.

(2) Any person trained in a Government Medical College or School who holds a diploma or a certificate granted by Government Medical College or School who holds a diploma or a certificate granted by Government declaring him to be qualified to practise Medicine, Surgery and Midwifery, or to be qualified for the duties of a Military Assistant Surgeon, Hospital Assistant or Sub-Assistant Surgeon; or any person who holds a diploma or certificate to the same effect, granted by the King Edward Hospital Medical School at Indore, or the Medical School, Hyderabad (Deccan).

Proceedings of Societies Conferences etc.

THE ALL INDIA MEDICAL LICENTATE'S ASSOCIATION, MADRAS BRANCH.

As a protest against the non-inclusion of the Medical Licentiatees in the Indian Medical Council Bill which is to come off in the next session of the Indian Legislature, a public meeting was held under the auspices of the above association at "Gana Mandir" No. 10, Thambu Chetty St., on Sunday the 3rd July under the Presidentship of Mr. Sami Venkatachalam Chetti, M. L. C.

Prominent amongst those that were present on the occasion were Drs. U. Rama Rao, V. Rama Kamath, D. Venkappa, R. Ramanujulu Naidu, K. B. Bhujanga Rao, A. C. K. Hebbar, K. C. Paul, U. Krishna Rao, V. D. Nimbkar and M. Sanjiva Rao.

The President while expressing his gratitude for the opportunity given to him to address the gathering on such an important subject as the one before the house, explained in brief the Bill, its introduction in the Indian Legislature and the necessity and the importance of including the Medical Licentiatees within its purview.

The following resolutions were then moved and passed unanimously.

1. This meeting condemns the Indian Medical Council Bill as introduced in the Indian Legislative Assembly on the 23rd March, 1932 as a breach of faith committed by the Government of India with the Medical profession of India, inasmuch as it differs radically both in principle and in details from the Bill which was circulated by the Government for professional opinion on the 31st August, 1931 besides it intends to divide the noble profession of Medicine into two sections permanently by providing a "Register of higher grade of Practitioners" only and as such is absolutely unacceptable to the profession, whose unanimous demands for its amendment have been flouted. This meeting appeals to the Members of the Indian Legislative Assembly and of the Council of State to refuse permission for the first reading of the Bill.

2. This meeting resolves that the Committee appointed by the Standing Committee of the All India Medical Licentiatees' Association in connection with All India Medical Council Bill should co-operate with the committee of Bombay Medical profession appointed for the purpose and is empowered to take necessary steps to ensure the rejection of the Bill, and in particular, to canvass the

votes of the Members of both Chambers of the Central Legislature and further to send representatives to Simla for the purpose when the Bill is on the anvil.

3. This meeting hopes that all Medical Associations in India will realize the breach of faith committed by the Government of India with the profession, and will take necessary action in the matter and in particular, will individually canvass votes of the members of either Legislature residing in their provinces in favour of rejecting the Bill before its first reading.

4. This meeting resolves that the President be authorized to send copies of these resolutions to the Members of the Central and Provincial Legislatures, the Department of Education, Health and Lands, Government of India, and Local Governments, all Provincial Medical Council, all Medical Associations, sympathisers and the Press.

Dr. U. Rama Rau the mover of the first resolution while tracing the origin of the Bill, its history, growth and the opinions passed by different Medical Councils and other Medical Associations thereon pointed out how the Government of India are going against the primary principle and the object of the Bill of establishing "A uniform minimum standard of medical qualification in Medicine for all Provinces such that persons attaining thereto shall be acceptable as Medical Practitioners throughout British India" by non-including the Medical Licentiates within its purview.

Dr. V. D. Nimbkar and Dr. K. C. Paul who moved some of the above resolutions emphasised the futility of the caste system in the medical profession and pointed out the need for establishing a "Uniform minimum qualification in Medicine" in order to maintain the dignity of the profession. While strongly favouring the inclusion of the Medical Licentiates within the purview of the Bill they emphatically protested against it as it now stands.

Drs. V. Rama Kamath and D. V. Venkatappa also spoke in support of the resolutions, the former in a stirring speech pointed out "The breach of faith committed by the Government of India with the medical profession of India" and showed how an unknown mischievous element somewhere is working for the bill in spite of unanimity of protest all over India against the non-inclusion of the Licentiates and the very encouraging opinion expressed towards this class of medical men by the important heads of the administration such as Viceroys, Governors and Ministers. He also brought to the notice of the Government how an entirely public body as the Chamber of Commerce in Rangoon to whom the bill was referred by the Burma Government opined and it would have no place in that country as it excluded the medical licentiates. He further made an earnest appeal to the Chair, the Public and the Members of the Indian Legislature

to wield their influence over the Government on this vital question. The latter spoke at length of the good work turned out by this well organized body of medical men, the All India Medical Licentiates' Association and stressed the necessity of their inclusion.

The learned President Mr. Sami Venkatachalam Chetty in his concluding remarks expressed his satisfaction that the medical licentiates had a good cause to fight for in view of the opinions cast by the various speakers. He promised that he would do his best in whatever sphere of work he might be to promote the success of the medical licentiates.

The meeting terminated with a vote of thanks to the Chair, the public and the medical men who kindly responded to the invitation. In the end the Secretary announced another public meeting to be held under the auspices of the Association on another vital subject—Medical Education.

U. D. GOPAL RAO.

Hony. Secretary.

Book Reviews.

Medical Administration of Teaching Hospitals.—By Emmet B. Bay, M.D., 1931, pp. xvi plus 136. [The University of Chicago Press, Chicago]. Two Dollars.

The medical administration of teaching hospitals presents certain thorny problems which demand solution if these institutions are to function properly. We, in Madras, who possess none but state-managed teaching hospitals can scarcely realize all these problems. But even here some of them are actually felt. Thus, for instance: Should all the beds available in a teaching hospital be "free" beds or not? If not, in what proportion should the "free" and the "paying" beds be distributed? Are the "paying" beds available for teaching purposes? What criteria determine the suitability of a patient for admission into a teaching hospital? Is it advisable to allow the wards of a teaching hospital to be over-run by acute cases unsuited for teaching purposes? We have not solved these problems, but they are not non-existent. In America, where the majority of the teaching hospitals are community or privately owned institutions with charters defining their functions the problems are far greater and more complex. It is these problems Dr. Bay has presented in his book, which is really a comparative study of the conditions of medical administration obtaining in 19 important hospitals in the United States, practically all of which are concerned in teaching. Dr. Bay has analysed his data carefully and arrived at some sound

conclusions. He has shown clearly that it is in the best interests of the hospital to have the administration entrusted to one individual (as is the practice in our state-run hospitals) instead of making a governing body or board of trustees responsible for it. Again, he would have it that when a patient is admitted into hospital it is the duty of the hospital to remain in touch with the medical attendant of the patient, if he has one, so that not only may the patient have continuity of medical advice after discharge but also the medical attendant benefit by an accurate knowledge of what was done for his patient by the hospital staff. The keeping of medical records has also been gone into by the author who shows a preference to the unit record system now obtaining in several of the big hospitals in the States. Dr. Bay has indeed written a thought provoking book which every one interested in the medical administration of teaching hospitals should read.

It is interesting to note that this volume is one of a series entitled "The Medical Economics Series" edited by Michael M. Davies.—K.C.P.

Deliverance from Cancer.—By H. Reinheimer, [Rider & Co., Paternoster Row, London]. 5/- sh.

Cancer claims a large percentage of the total mortality in this world. In spite of great advance in the Medical science the death rate from cancer has not been appreciably diminished. There are many workers silently investigating this knotty problem. No one has been able to find out the real cause of this dreadful disease. There are many theories about its causation; but the multiplicity itself proves that we have not found the real cause.

Mr. Reinheimer has attempted to show to the world that, it is meat diet, unnatural living that is responsible for the high rate of cancer in the civilized world. This book is a welcome addition to mass literature on this subject. It is only time which will prove the truth of his contention. We in India are most of us born vegetarians but unfortunately we find that our simple diet has not given us any immunity from cancer. Hence this book may not convince many of us. There are many hints scattered in the book regarding improvement in diet and mode of living.

It would be easier to follow the author if one reads his previous work on symbiosis.

This book is chiefly a criticism on the finding and opinions of other workers in the field of research. Medical profession has not escaped from the severe criticism. The book is full of Latin verses and quotations which make the book dull for those who are ignorant of the language. If the book had been written in a plain and simple way many lay people would have been acquainted with this gospel of

Mr. Reinheimer. It is an admitted fact that the education of the public is essential in fighting against Cancer.

The book is handy and the price is moderate.—J.N.K.

Posture—Its relation to health.—By Frank D. Dickson, M. D. [J. B. Lippincott Company, 16th John Street, Adelphi, London, W.C. 2.] Price 21/- net.

An extremely interesting book, which should be read by every physician and surgeon. There is so much in it, which will be very instructive to a layman, and the whole subject is written in such a simple style, that he will not have much difficulty in following it, and carrying into actual practice the advice given therein. It is worth noting, what the Editor says in the introduction, "Posture has been a very dominant factor in Mammalian Evolution, and the effect of posture on mentality, is no myth but a proven fact".

Many of the theories quoted in the book, are very interesting and original, especially about the abdominal boundaries and the structures within them, which are so arranged "as to form ledges or shelves upon which the organs rest".

On page 19, the importance of the maintenance of the tone of the abdominal muscles, especially in the lower part of the abdominal wall, is well explained and emphasis is laid on the fact that "the support of most of the abdominal organs depends upon them (muscles) directly or indirectly", which should be remembered by every surgeon before undertaking any operative treatment for prolapsed abdominal viscera like kidney etc.

(P. 43) The theory about the useful effects of insulin, is a new innovation and is worth giving a trial. The author says that "used carefully, insulin may be useful in the treatment of ptotic cases". It helps by increasing the weight and stimulating appetite etc. A very useful hint is given to parents on page 55, where the author says "There is no such thing as growing pains, and such complaints on the part of the child, should be recognized as signs pointing towards faulty body mechanics".

On page 72, the author says that his experience has led him to give up entirely the use of braces, for the correction of bow legs and knock knees, and that the majority of such cases can be cured by proper balancing of the shoes, according to the method given by him. We do not know if this has been the experience of every orthopaedic surgeon, but no doubt this method of treatment will be more comfortable to the patient himself, and less cause of worry to the surgeon, as very rarely does a surgeon succeed in getting a pair of braces made, which a patient would not complain of a being cumbersome and badly fitting.

Chapter VII, deserves careful reading as regards the relation of albuminuria, to posture.

On page 149, is given a fine description of the muscle, which helps to maintain the arch of the foot, and special attention is drawn to their importance. The author says, that in both standing and walking the foot muscles, form the chief support of the bones of the

foot and that the ligaments are only passive structures, which bind the bones together. We do not know how far the view will be shared by other orthopaedic surgeons, but all the same the arguments put forward are very reasonable.

In the concluding portions of the book, different exercises for correcting postural defects are given, and fully explained, with clear diagrams and pictures. The exercises seem to be very useful, and easy enough to be practised by a layman, with a few practical hints in the beginning. After going over the description of the exercises one is reminded of the more thorough and more perfect system of Indian Yogic Asanas. It is such a pity, that this wonderful Indian system is not studied more thoroughly, and put to practical use, by modern medical men and has become so far the sole monopoly of people devoted to higher metaphysical and Yogic practices.

In the last chapter, the author gives a sound advice to doctors, who at once go in for physical therapy and rush after a treatment "which will irritate, warm or burn a patient so that he or she may feel that something is being done." We must not forget that "the indications for ultra-violet rays, infra red rays etc. are as clear cut as those for the administration of digitalis and quinidine."

On the whole the book is very interesting and contains many original ideas. We highly recommend it to both the medical students and practising doctors.—V.M.K.

Introduction to Mental Hygiene.—By Earnest Groves and Phyllis Blanchard [Gerald Howe Limited, 23 Soho Square, London.] Price 16 sh.

Mental Hygiene, as a constructive effort for the betterment of human relationships is too well known to require any definition. How it started nearly 23 years ago through a man who was himself mentally afflicted and through whose persistent efforts and powers of organisation, it took root, grew and flourished into an International movement are matters of common knowledge.

Mental Hygiene is both a science and an art. But it is as a movement and as a world-wide organisation that it has attracted the attention of the public. But when a new order replaces the old or when a new thought is presented for consideration, there is always the likelihood of a diffusion of scrappy items in the public mind, with the consequent disadvantage that the real significance of the new idea is missed or misinterpreted. The book before us must obviate any such contingency. As an authoritative collection of principles and facts of mental hygiene, this is the first book that we have come across, although we could claim acquaintance with the subject from the several periodicals and monographs that we have perused.

Directed at first, towards the treatment, and prevention of mental disease, Mental Hygiene has now a wider application. In its broadest sense, it includes "the whole life adjustment of the individual. Thus, education, marriage, parenthood and industry—all relationships of individuals to each other and to their environment have their mental hygiene aspects".

These aspects have been dealt with by the authors in the successive chapters of their book, which is written in a popular language and the psychological implications are set forth in understandable style.

A questionnaire at the end of each chapter, with suggestions for written reports, and an exhaustive bibliography form a pleasant feature of the book. The authors evidently want to make it a text-book, to be read, pondered over and digested, bearing in mind, the importance of the subject.

Through practical application of science to problems of human adjustment, personal and social happiness is bound to come. This is what Mental Hygiene teaches. "What other method of dealing with individual and social problems, has equal promise"

It is a comprehensive volume on a fascinating subject of utmost significance in the modern erudition of society.—F.N.

A Century of Progress.—This is the title of the Souvenir that has been published by Messrs. C. J. Hewlett & Son Ltd. London on the occasion of the celebration of the Centenary of that Firm in the beginning of this year (1932). One hundred years of uninterrupted and unstinted service to humanity is a proud record in the life of a Firm of the standing and reputation of Messrs. Hewletts and the history of its activities printed in this booklet affords interesting reading. We wish the Firm many more Centenaries and its proprietors continued prosperity and success in their enterprise.

Books Received.

The following books have been received and the courtesy of the Publishers in sending them is acknowledged. Reviews will be published from time to time.—[Ed. A.]

- The Empire's Open Sore.**—British Empire Leprosy Relief Association, 29, Dorset Sq., London.
- Care of the Eyes.**—J. C. Basak, 363, Upper Chitpur Road, Calcutta. 12 As.
- The Medical Annual, Jubilee Volume 1932.**—John Wright & Sons, Bristol, 20 sh.
- Quarterly Bulletin of the Health Organisation.**—Publication department of the League of Nations, Geneva. 2 sh.
- Mrs. Lucy C. Mullick's Home for Consumption.**—Annual Report for 1931. Pine Lodge, Ramdhara, Almora, U. P.
- Diet and Weight Control.**—S. W. Wynne. Liveright Inc, N. Y. \$ 1-00.
- Pharmacopoeia Indica.**—K. C. Bose, M. B. Dr. Bose's Laboratory Ltd., 45, Amherst St., Calcutta.
- Materia Medica of Pharmaceutical combinations and specialities.**—U. Nara-yana Rao, M.B., 97, Girgaon Road, Bombay 4.
- Synopsis of Midwifery and Gynaecology.**—A. W. Bourne, John Wright & Sons Ltd., Bristol. 5th Ed. 1932. 15 sh.
- Surgical Pathology of the Female Generative Organs.**—A. E. Hertzler, J. B. Lippincott & Co., 16 John St., Adelphi, London W. C. 2. 21 sh.
- The Pocket Atlas of the Fundus Oculi, 2nd Ed.**—G. L. Johanson, Adlard & Son Ltd., 21 Hart St., London W. C. 1.
- To Husbands and Fathers.**—Association of Maternity and Child Welfare Centres, Carnegie House, 117, Piccadilly, London W. 1. 3d.

- Euthanasia.**—C. K. Millard, C. W. Daniel & Co., 46, Bernard St., London W. C. 1. 2 sh.
- Report of the Medical Research Council for the year 1930-31**—Committee of the Privy Council for Medical Research, H. M. Stationery Office, London 2 sh. 6 d.
- Electricity in our bodies.**—B. H. C. Mathews, George Allen & Unwin Ltd., 40, Museum St., London W. C. 1. 4 sh. 6 d.
- Protective measures against danger resulting from the use of Radium, Roentgen and Ultraviolet Rays.**—League of Nations, Information Section, Geneva. 3 sh.
- Tuberculosis in Denmark, Norway and Sweden.**—Dr. Ostenfeld, Dr. Hertmann and Dr. Neander, League of Nations, Information Section, Geneva. 6 sh.
- A Pocket Guide to Medical Life Assurance, 3rd Ed.**—J. J. Cursetji, M. D., Oriental Life Assurance Co., Ltd., P. Box 148, Bombay. Rs. 5-8.
- The Indian Medical Council and Associate Problems.**—C. P. Chaube, M.B. B.S., 7 Rajpur, Road, Delhi. Price Re. 1-8.
- Health Section Report—World federation of Education Associations, Denver, Colorado.**—American Child Health Association and the Metropolitan Life Assurance Co., N. Y. City.
- Filterable virus diseases in Man.**—J. Fine, E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. 6 sh.
- Guide to Radiological diagnosis in Heart Disease**—G. Nemet, Heart Committee of the New York Tuberculosis and Health Association, Inc., 386, Fourth Ave, N. Y.
- Practical Endocrinology, 2nd Ed.**—H. R. Harrower, Pioneer Printing Co., Inc., Glendale, Calif. \$ 5-00.
- Cholera in Garhwal During 1927.**—Rai Bahadur Capt. Pitambar Pant L.M.S., P.M.S., Civil Surgeon, Unao.
- Popular Food recipes for Common ailments.**—L. E. & J. H. Oliver, C. W. Daniel & Co., 46, Bernard St., London W. C. 1. 6 d.
- Individual Psychology and Psychosomatic disorders.**—W. Langdon Brown and others. C. W. Daniel & Co., London. 2 sh. 6 d.
- The Indian Medical Association, Report for 1931.**—67, Dharmatola Street, Calcutta.
- Crystallized Therapy 2nd Ed.**—M. V. Parulkar, D. A. Nadkarni & Co., Gowala Tank Road, Bombay 7. Rs. 10.
- A New Theory of Cancer and its treatment.**—C. F. Marshall. John Wright & Sons, Ltd., Bristol. 3 sh. 6 d.
- The Technique of Psycho Analysis.**—H. V. Hattengberg C. W. Daniel & Co., 46, Bernard St., London. 5 sh.
- Emigration, Migration and Nomadism.**—Walter Heape W. Heffer & Sons., Ltd., Cambridge. 12 sh. 6 d.
- International Medical group for the investigation of Contraception—Birth Control Investigation Committee, London.** 2 sh.
- Essentials of Surgery.**—R. L. Spittel, Butterworth & Co., (India) Ltd., Calcutta. Rs. 8.
- Medical Palmistry.**—Capt. Y. A. Telang The Medico, Surgical Hall, Mapuca, Goa.
- The Practical Medicine Series.**—The Year Book Publishers, 304, Smith Dearboun St., Chicago. Comprising the following seven volumes:—
1. **General Surgery.**—E. A. Graham. \$ 3.
 2. **The Eye, Ear, Nose and Throat.**—E. V. L. Brown & G. E. Shanbaugh \$ 2.50.
 3. **Pediatrics.**—I. A. Abt. \$ 2-25.
 4. **Dermatology Syphilis and Urology.**—F. Wise & M. B. Sulzberger & J. H. Cunningham. \$ 2-25.
 5. **Neurology and Psychiatry.**—P. Bassoe and F. G. Ebaugh. \$ 2.25.
 6. **Obstetrics and Gynaecology.**—J. B. Delee and J. P. Greenhill. \$ 2.50.
 7. **General Therapeutics**—B. Fantes and L. B. Kartoon. \$ 2-25.
- Autotherapy.**—Ch. H. Duncan, 2612, Broadway, New York.
- Heart Disease—The Principles of Diagnosis and treatment.**—C. Bramwell, Edward Arnold & Co., London. 12 sh. 6 d.

Preparations & Inventions.

Theelin.—Manufactured and distributed solely by Messrs. Parke Davis & Co. U.S. America under license from St. Louis University.

Theelin is the name given to the ovarian follicular hormone first isolated in crystalline form by Dr. E.A. Doisy, Professor of Bio-chemistry at the University of St. Louis. *Theelin* is of particular value in disorders due to the natural menopause—vaso motor disturbances evidenced by headache, hot flashes, insomnia, emotional instability &c. *Theelin* in these cases has a prompt and decided effect in restoring the physiologic balance. *Theelin* is most effective in functional amenorrhea. It is available in two forms, one for intramuscular and subcutaneous administration and the other for intravaginal application.

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Remogland.—Manufactured by the Remogland Chemical Co., New York. Stockists:—Sri Krishnan Bros., Post Box 166, Madras.

This is the trade name for hormone preparations for men and women respectively. Deficient secretion from the sex glands has not alone its direct effect on the sexual functions themselves, but there are, also many resultant systemic derangements. In the male, there is infantilism, eunuchoidism, impotence and deficiency in secondary sex characters; in the female, sterility, frigidity, obesity, metabolic disturbances, etc. The value of the Remogland preparations has been abundantly proved clinically in cases of the types mentioned and the results have been gratifying in obviating many of the depressing physical and psychic symptoms.

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