ON ANTENATAL THERAPEUTICS.

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By J. W. BALLANTYNE, M.D., F.R.C.P.E., F.R.S.E.,
Lecturer on Midwifery and Diseases of Women, Medical College for Women, Edinburgh; Examiner in Midwifery in the University of Aberdeen; Honorary Fellow of the Glasgow Obstetrical and Gynaecological Society.

THE medical profession stands upon the threshold of antenatal therapeutics. It has been standing there so long that even the unbiassed onlooker must have begun to wonder when it intended to enter in, whether indeed it did not mean to turn away again from the open portal. Not but that there has been some entering in, of a retiring kind, unobtrusive, stealthy, passing unobserved by the spectator who is growing weary of watching. High time is it that an estimate be formed of the probabilities and possibilities of antenatal therapeutics. Even if the possibilities turn out to be small, vanishing almost, it will yet be better to know than to remain ignorant. *Omne ignotum pro magnifico* will not serve as a cloak; for the unbiassed onlooker (already referred to) is hardly prepared to admit the existence of an *omne, notum* or *ignotum*. It is, of course, everywhere admitted that much may be done after labour, even in labour, to cure or at least to ameliorate morbid states arising during antenatal life; but this is not usually regarded as antenatal therapeutics in the strict sense of the term. It may be claimed, however, that it is an integral part of the subject, and I look upon the claim as one that must be yielded. In this way the field is greatly widened; and the subject at once becomes one of great practical importance. Even in that part which deals with the treatment of the embryo and foetus still *in utero* (and which is regarded by many as constituting the whole of antenatal therapeutics) it will be found that advances have been made and victories won. The subject is not so hopeless, although neglected, as is generally supposed.

CAUSES OF ANTENATAL MORBID STATES.

In the preceding lectures I have endeavoured to give a survey—very incomplete, it must be admitted—of the field of research designated antenatal pathology. I have insisted that it is probable that in the antenatal period of life the same causes are at work as in the postnatal epoch; that in other words, the agencies which produce pathogenic and toxic effects when acting upon infantile and adult organisms lead to pathogenic and toxic effects when acting upon the foetus, and to teratologic results when acting upon the embryo and germ. I have also pointed out that the phenomena of antenatal pathology are not of one kind only, but are many—sterility, single and double monstrosities, abortions, stillbirths, and mortinatalities, twinning, foetal diseases, many tumours, congenital debility, and tendencies dissolving heredity and leading to the later development of tubercle, rheumatism, and a great number of neuropathic disorders—these and not monstrosities and foetal diseases only are the protean phenomena of antenatal pathology.

There is good reason to believe that the morbid causes also are not one but many, and that all the toxic and pathogenic agents whose action in postnatal life is known may act before birth upon the developing organism. In this way the poisons, such as alcohol, lead, morphine, nicotine, and the rest, and the microbes and their toxins, such as those of tubercle and the exanthemata, and to some extent traumatism, enter into the arena of antenatal etiology, and have to be taken into account in the investigation of every instance of antenatal pathology. So far as has been discovered one and the same morbid cause may produce in one instance a foetal disease, in another an embryonic monstrosity, and in another a tendency to the breaking of normal heredity in the development of a proneness to certain maladies of body and mind in later life. Yet, again, this same cause may produce sterility, embryonic or foetal death, possibly twinning, and certainly abortion and premature labour. In syphilis and tubercle and alcoholism are to be found three morbid causes which may produce the protean effects which have been enumerated. Further, similar effects may be produced by

different causes, the results depending apparently not so much upon the nature of the morbid agent as upon the time of its action and the condition of the organism acted upon. It is probable that if it were possible to reduce these morbid actions to their ultimate factor, it would be found to be the common one of interference with nutrition, and therefore chemical in its nature. It is also probable that the *modus operandi* of the morbid causes must be looked on as an arrestment of normal processes. Even in the cases of excessive formation as exemplified in the double terata, the cause may still be regarded as acting by means of an arrest of normal processes, the processes, namely, which prevent polyspermy and parthenogenesis. It is necessary to keep all these views in mind in any attempt at a systematic exposition of the possibilities and probabilities of antenatal therapeutics.

THE ANTENATAL DEATH ROLL.

In many respects the field of research, which has been designated antenatal pathology, resembles a battlefield, rather perhaps a whole campaign. It is indeed a field thickly strewn with the dead, the dying, the wounded, the maimed. No estimate has ever been formed of the loss of life which takes place immediately after birth as the direct result of birth, during birth from the traumatism of labour, in the foetal period, in the embryonic epoch, and during germinal life. Mortality tables tell something of the frequency of death during the first months of life, obstetricians know something of the many times that they have to deal with premature labours, stillbirths, and abortions; but I doubt whether the most pessimistic has an adequate conception of the loss of life in the earlier periods of antenatal existence. Even if we neglect all deaths occurring before the third month of intra-uterine life, the result is nevertheless appalling. But, it may be asked, Has this life that is lost any great economic value? With a population going up by leaps and bounds, does it very much matter whether so many foetuses and embryos perish before they look upon the light? From the standpoint of the strict and rigid utilitarian, perhaps not, if the population be going up by leaps and bounds. But, if not, what then? The social economists of a country whose population is stationary or receding are likely to give a different answer to this question. Besides, it is not only antenatal death that has to be taken into account; we have to think of the antenatally wounded, crippled, and diseased. It may, I think, be safely taken for granted that there is the need for antenatal therapeutics.

THE POSSIBILITIES OF ANTENATAL THERAPEUTICS.

To revert to the comparison instituted between antenatal life and a campaign, it will be evident that the individual may require medical treatment after the battle, during the campaign, or before the war. For the wounded from the battle the Army Medical Department provides the ambulance corps, the field hospital, and the base hospital; but it does more, it endeavours to keep the troops healthy and in a healthy environment during the campaign, and by means of a good water supply and suitable food sends them into the fight fit to bear the strain to which they will assuredly be subjected. Yet more, before the campaign is begun the medical inspection of recruits is the subject of great care, and only such are selected as give promise of strong and healthy development; and when selected these are still further trained until they become almost perfect fighting machines. Like all comparisons, this one may be pushed too far; but it may be said generally that the postnatal treatment of morbid states arising during birth, or before birth, corresponds to the field and base hospitals, being mainly reparative and palliative; that intranatal therapeutics and the treatment of the foetus and embryo may be likened to the care of the soldier during the battle and in the whole campaign, being mainly preventive; and that germinal therapeutics resembles in its possibilities the work of the recruiting sergeant and the drill instructor being mainly selective and preparatory. The watchwords, then, in both cases, must be repair, prevent, prepare, and select with care.

POSTNATAL TREATMENT OF ANTENATAL AND INTRANATAL MORBID STATES.

It may be thought to be almost a work of supererogation to

enter into details regarding what may be done after the birth of the infant to remedy the ills with which it comes burdened into its extrauterine existence, but it is doubtful whether the medical profession realises how much may be done and is done in this direction. Few indeed are the malformations which are compatible with the life of the individual that have not now come under the sway of the surgeon, and there are several instances in which his skill has made anomalies that were formerly regarded as certainly lethal no longer so. Less immediate and less striking beneficial results have followed the ministrations of the physician and obstetrician, but here also noteworthy advances have to be reported.

As has been said, it is in the domain of surgery that the postnatal treatment of antenatal morbid states has secured its most noteworthy triumphs. Club foot, cleft palate, hare-lip, phimos, imperforate hymen and anus, congenital dislocation of hip, shoulder, and knee, torticollis, spina bifida, congenital fistulae, cysts, and tumours of various regions, umbilical and other herniae, extroversion of the bladder, atresia of urethra, vulva, or vagina, epispadias, hypospadias, non-descent of the testicle, vulvar anus, supernumerary digits, syndactyly, congenital absence of tibia, fibula, and radius, and many other conditions quite as markedly antenatal in origin, are every day taxing the ingenuity of the surgeon. In the repair of some of these deformities surgery has been quite successful; in others, such as ectopia vesicae, congenital dislocations, and absence of fibula or radius, only a moderate degree of success has been registered. Even in the latter, however, there has been progress; attempts to close the bladder in extroversion of that organ have been abandoned for the implantation of the ureters into the rectum, and that in its turn seems likely to give way before the implantation of them into the dorsum penis; the so-called bloodless methods of reducing congenital dislocation of the hip appear to be gaining ground as compared with the various cutting operations, and so also with other deformities and their treatment. Further, it cannot be doubted that new triumphs await the orthopaedic surgeon in the dealing with such conditions as meningocele, encephalocele, parasitic or attached fetuses and united twins. Scarcely any serious attempts have yet been made to correct the internal malformations, and the reparative surgery of congenital diaphragmatic hernia, of kidney in the pelvis, of intestinal and oesophageal atresia, and the like has to be elaborated.

The results obtained by the physician in his treatment of antenatal morbid states, although less brilliant than those of the surgeon, have yet been sufficiently good to encourage further efforts. It is unnecessary to do more than refer to the beneficial effects of medicinal treatment of the manifestations of congenital syphilis, and the value of thyroid feeding in cretinism is well known. It must, however, be confessed that little success has as yet attended the medical treatment of the congenital skin diseases, and ichthyosis, tylosis, sclerema, hypertrichosis, hypotrichosis, naevus neuroticus, and congenital elephantiasis must still be looked upon as nearly intractable. The ordinary form of jaundice of the newborn yields readily to treatment of the simplest kind, but the grave form does not yield at all. Umbilical haemorrhage usually requires surgical interference, and that of a very active kind, to control it; congenital heart disease handicaps the individual for life, and congenital dropsical states are rarely amenable to the drugs of the physician.

On the other hand, wonderful results have been obtained in the branch of medical practice that deals with congenital defects and diseases of the nervous system. Witness the effect of medically regulated educational training upon the congenitally blind, and deaf and dumb, and idiotic. The combination of medical supervision with educative methods has almost made the blind to see, the deaf to hear, the dumb to speak, and the idiot to understand. This is no random statement, for everyone knows what the congenitally blind, deaf, or dumb can accomplish, notwithstanding his infirmity. With regard to idiocy, the following sentence contains a report of the results of twenty years' work in its alleviation: Of patients discharged after full treatment, 10 per cent. are self-supporting, whilst another 10 per cent. would be so if they had obtained suitable situations, and about 20 per cent. were reported as useful to their friends at home.

In one direction, however, the treatment of idiocy has not

been altogether encouraging. I refer to craniectomy for its microcephalic form. The operation is not uncommonly followed by evident and immediate improvement, which continues up to a certain point, and then all that has been gained is too often steadily lost. Blanc² is probably right when he says that in primitive microcephaly the arrest in brain development has occurred before the fourth month of intrauterine life, and that, therefore, the division of the cranial vault does not reach the root of the mischief; it is not the cranium but the brain that is at fault. In the cases that are developed later the operation is more hopeful. In this relation it may not be out of place to refer to the treatment of cranial depressions in the newborn by trephining. Sometimes the natural resiliency of the bones restores the normal form of the head, and obviates symptoms; but this good result does not always follow. In a case of which Dr. D. D. Jennings³ (New York) kindly sent me the notes, the use of forceps had produced a distinct depression of the left frontal bone; pneumatic suction was first tried, and, that failing, the trephine was employed and the bone elevated. The child made an uneventful recovery. It seems to me that this mode of treating congenital depressions and fractures of the cranium might be extended with advantage.

Part of the post-natal treatment of ante-natal morbid states falls into the hands of the obstetrician. He it is who has to deal with apnoea neonatorum, and it will be well if he give heed to the causes of this morbid state, for it is very certain that all instances of still-birth are not due to one cause, and are not therefore all amenable to the same treatment. The obstetrician ought to scrutinise each case, endeavour to ascertain the special cause, and treat accordingly. I fully believe that the Schultze swinging in asphyxiated infants is not invariably the best thing for them. It also falls within the province of obstetrics to examine the newborn for fractures, dislocations, and imperforations, and to remedy them as far as may be. I need not refer to, for everyone knows the value of, the incubator and the wet nurse.

INTRANATAL THERAPEUTICS.

Intranatal treatment, under which I include the management of the infant during labour both in the uterus and in the vagina, is entirely in the hands of the obstetrician. It is mainly preventive in character. In discussing the intranatal factor in neonatal pathology I pointed out some of the risks run by the infant on his way through the birth canals. There is, for instance, the danger of septic or gonorrhoeal or syphilitic infection affecting the eyes or mouth or lungs; this danger may be almost entirely averted by the prophylactic vaginal douche during labour, and by the cleansing of not only the eyes but also the nose and mouth of the child immediately after birth. Prophylactic douching in labour for the sake of the infant is a procedure the full value of which has not, I think, been fully appreciated as yet. Again, the obstetrician has it in his power to prevent tetanus neonatorum by the application of surgical cleanliness to the dressing of the umbilical cord, and by the same means it may be confidently anticipated that erysipelas neonatorum and omphalitis with defective closure of the umbilical ring will be banished from practice. The rational treatment of the physiological flow of milk from the breasts of the newborn will prevent many of the cases of mammary abscess due to the mistaken notion in midwives' minds of the necessity of "breaking the breast strings." The almost complete banishment of ergot until after the infant is born has already doubtless saved many infantile lives, and the rapid delivery of the second twin is, I believe, a step in the right direction.

Further, every improvement in obstetrical instruments and manipulations is beneficial to the foetus. The better the forceps and the more correctly it is applied in the right cases the greater will be the infant's chance of being born alive and free from intracranial haemorrhages and facial paralysis; and the more thorough the obstetrician's knowledge of the safe methods of delivery in contracted brims, in face cases, and in head-last labours the better it will be for the child. It may be suggested further that in cases of fluid accumulations in the foetus, such as hydrocephalus, ascites, and distended bladder, diagnosed in labour, it may be well to aspirate instead of widely incising the affected region of the infant;

the tapping of the spinal canal in breech cases with hydrocephalus ought to be kept in mind.

It will not be out of place if I here strongly insist upon the necessity for the registration of stillbirths that exists in our country. Registration, if it were obligatory, would necessitate necropsy, and necropsy would do much to familiarise the medical practitioner with the appearances of stillborn infants, and would be of enormous value in elucidating the causes of intrauterine and intranatal death. Tidy⁴ says:

So notorious is it that a large number of these deaths could be averted, that some legislation is urgently needed, requiring that stillborns, whose bodies weigh say not less than 2 lbs. (the average weight about the sixth and seventh months, and at which age children are viable), should not be buried without registration and a medical examination.

Although it may not be well to insist upon it by law, it would also be most beneficial to our treatment of antenatal states if fetuses of less than six months were also submitted to *post-mortem* investigation by the medical man in whose practice they occurred.

ANTENATAL TREATMENT: INTRAUTERINE.

Many misconceptions have gathered round the subject of the treatment of the infant still *in utero*; and while some have greatly exaggerated the possibilities, others have greatly minimised them. From some of the statements that have been made by enthusiastic antenatal therapeutists, it might be imagined that drugs could be passed directly into the unborn infant as one pours a liquid from one bottle into another. On the other hand, it would seem as if those who are sceptical regarding antenatal treatment had come to believe that the foetal economy was absolutely separate from and independent of the maternal. Now, as is so often the case, the truth lies somewhere between these two extremes.

It is possible to bring medicinal and hygienic influences to bear upon the embryo and foetus while still *in utero*, but it is absolutely necessary that these shall act first upon the mother; antenatal treatment is primarily maternal; it must be so. A very superficial study of the physiology of foetal existence serves to convince the investigator that the only certain way to reach the foetus is through the placenta, for it cannot be regarded as proven that the amniotic route, as it may be called, is open. Now it has been already pointed out that the mechanism of transmission of medicinal substances through the placenta is as yet imperfectly known, and it is not even certainly known which minerals pass through into the foetus and which do not. The knowledge that we possess, although small, is nevertheless valuable, and can be turned to practical account. If there is one thing that is certain about antenatal therapeutics, it is the beneficial effect upon the unborn infant of the administration of mercury to the mother suffering from syphilis. It might at first sight be regarded as almost certain that it would be found that mercury passed freely into the foetal economy. Experiment, however, has shown that mercury is apparently transmitted not at all through the placenta but is entirely stored up in its substance. How, then, can the beneficial result be accounted for? Simply by bearing in mind that the placenta is the most vital and also the most vulnerable organ that the foetus possesses, and that if it can be kept healthy the rest of the foetal structures will also benefit. The mercury, therefore, cannot be located in a better position than just in the placenta. Hitherto the treatment of the syphilitic foetus has been simply an incident in the general treatment of the syphilitic mother; but E. Fournier⁵ has recently advocated the administration of mercury to the mother who is apparently free from syphilis not for her own sake, but in order to influence the foetus in her uterus, the victim of syphilis of paternal origin. This is a step in the right direction, and might be well imitated in cases of tuberculosis, malaria, and lead poisoning in the father. It may be suggested that the giving of quinine to the mother of a malaria-stricken foetus will lead to abortion. It is, of course, true that this result is possible, but in cases in which mother and foetus have suffered from ague quinine has not proved dangerous, and it might at any rate be tried in the foetal malaria of paternal origin.

Besides mercury and iodide of potassium and quinine, potassium chlorate has been found of benefit in cases in which there has been a tendency to the recurrence of abortion

and premature labour. It is spoken highly of by Sir James and Professor A. R. Simpson⁶ and by Mr. Lawson Tait. My experience of it is confined to a case in which a woman had on at least two occasions given birth to dropsical fetuses, and in whom the regular ingestion of the drug along with iron during the whole of her next pregnancy apparently enabled her to carry her infant to the full term, but did not prevent it being again dropsical. I also administered it twice to a patient who had aborted more than once, with the result:—possibly a coincidence—that on each occasion when she was taking the chlorate she not only carried a living child to the full term but to fully a month beyond it.

The pregnant woman should be protected as far as possible from the risk of infectious maladies, both for her own sake and for the sake of her unborn infant. It has been shown that not only may a pregnant woman suffering from small-pox, scarlet fever, measles, erysipelas, and the like, transmit the same disease, although not necessarily the same form⁷ of it to her infant *in utero*, but she herself may escape infection through previously-acquired immunity or idiosyncrasy, and yet the foetus in her womb may be infected, and be afterwards born with the traces or the effects of the malady upon him. It must, therefore, be laid down as a fact that it is dangerous for the infant *in utero* for his mother to nurse a brother or sister in an attack of measles or scarlet fever. In the case of a pregnant woman suffering from any disease, infectious or not, the better the treatment she receives the better it will be both for her and for her infant. Further, if it be true that infectious maladies affecting the mother in the earliest period of gestation may produce not diseases but deformities, as well as death, of the embryo, then the need for carrying all the precautions that I have referred to into the first months of pregnancy is self-evident.

There are certain trades which must be regarded as dangerous both for the pregnant woman and her unborn infant. She ought not to be allowed to run the risk of lead or copper poisoning, and, since abortion is very common among the workers in tobacco factories, working in them also must be looked upon as dangerous. The same remark applies to working in match factories. The danger of these things is recognised as far as the woman is concerned, but I am not sure that it is sufficiently so as regards the foetus. It is hardly necessary for me to refer to the pernicious effects of excess of alcohol taken by the pregnant woman upon her infant. If there is one thing more than another that experimental foetal pathology and teratology has shown, it is the evil effects of the alcohols and essences. Their effects are not, however, stereotyped, and it cannot be said that the child of a drunken woman is of necessity a drunkard; but it can usually be traced that he is an individual of weak power of resistance along one line or another—it may be along the line of inability to resist the temptation of alcohol—or to one form of disease or another. This weakness may have shown itself in the embryonic period in the development of structural anomalies or in the foetal or postnatal epochs in the proneness to the attacks of microbes or in forms of mental and nervous instability, including, it may be, the tendency to take alcohol or morphine or cocaine or absinthe in excess. Certain diseases are ascribed to alcoholic and other forms of excess; perhaps it is more correct to regard the taking of these things in excess and the diseases as equally the signs of weakened powers of resistance, which may in their turn have been induced by alcoholic or other excess during the mother's pregnancy. It is in every sense a vicious circle that is induced, but in the round are many maladies and morbid tendencies and not one predisposition only.

PUERICULTURE.

A good deal has been written lately regarding this, and there can be no doubt that the better the hygienic conditions that exist during pregnancy the better developed and healthy will be the offspring. It has, however, been shown that the stronger infants of the women who rest during the last three months of pregnancy as compared with those of mothers who have to work up to the very day of delivery are probably largely due to the fact that in them labour comes on at the full term and not prematurely. As to maternal impressions during pregnancy, it need only be said that it is inadvisable for the mother to be subjected to unpleasant emotions, just

as it is well for her to have the *mens sana in corpore sano*; but she ought not to be allowed to brood over disgusting or terrifying sights in the belief that scientific medicine regards it as in the least likely that her unborn infant will bear upon him the simulacra of such.

In concluding this part of the treatment of antenatal morbid states, I must refer, but of necessity briefly, to the induction of premature labour. As is well known, it is permissible, under certain circumstances, to induce labour before the full time to save the mother from the risks of Cæsarean section and embryulcia, and to give a chance of a living infant being born through a very contracted pelvis. Now one of the saddest experiences in obstetric practice is the death during delivery of an infant whose only fault is his large size and splendid development. When this occurs not once but several times, and when each successive pregnancy has for the infant the termination of *vita janua mortis*, it is perfectly justifiable to induce labour at an earlier period, in the hope that then the foetal head may be less fully ossified and better able to bear compression without permanent and fatal effects.

From all that has been said, it will be evident, therefore, that intrauterine prevention and cure are founded upon a knowledge of foetal and embryonic physiology and of the causes of diseases and deformities and monstrosities. The whole subject is much hampered by the difficulty of diagnosis; but it must always be borne in mind that the diagnosis to be of much use would have to be made long before the sixth month of pregnancy. The most valuable guides we possess are the knowledge of the state of health of the parents and the fact that foetal morbid states have a tendency to repeat themselves in the same patient. All this simply emphasises the conclusion already formulated that antenatal intrauterine treatment must be mainly preventive.

ANTENATAL TREATMENT: INTRAGLANDULAR.

Therapeutics in the earliest period of germinal life, when the future organism is represented by two specialised cells, a sperm and an egg cell, must of necessity be both paternal and maternal, and it must almost equally of necessity be mainly preparatory and selective.

There is not perhaps at the present day so much need as there was in the middle of the last century for the unborn babes to make their formal petition to the Censors of the Royal College of Physicians against the cruel mauling to which they were subjected by "hooks, pincers, and other bloody instruments," but there is assuredly some cause for an intrauterine protest against the lighthearted and foolhardy way in which all sorts of individuals rush into the most onerous and most responsible of contracts which men and women are capable of concluding in this world.

A PETITION FROM THE UNBORN.

I can well imagine the unborn infants demanding their rights in some such way as the following: We, the unborn, do here humbly set forth our right to be well born. We do not demand that we shall be born of wealthy parents, for we know from the sad experience of others once unborn like ourselves that millions of money without an hour's complete health to enjoy it is gall and bitterness. Neither do we ask that we shall be born of a titled stock; we prefer good blood to the much vaunted blue blood with a notorious deficiency in white corpuscles. We do not petition for parents with a hereditary history free from all blot and blemishes, for we know that such are not to be had; it will suffice us if we are provided with four long-lived grandparents, and with a father and mother who, in the words of one of the post-natal poets, have "self-reverence, self-knowledge, self-control; these three alone lead life to sovereign power." We ask to be protected from the fathers who in the very spring time of their lives, when they ought to have been sowing health and strength, were sowing disease and death, "wild oats" they called them, with a miserable attempt at self-deception. We object to springing from body cells weakened by abuse and toxic and pathogenic agencies. We wish publicly to express our abhorrence for fathers like the one to whom our friend, M. Fournier, refers, who, after his wife had thrice aborted and once given birth to a hydrocephalic foetus, all of them the stigmata of his syphilitic taint, came whining a tardy repentance:

Ah, docteur, si j'avais su. Si j'avais réfléchi à ce qui m'arrive aujourd'hui, et si j'en avais prévu de cela, je ne me serais certes pas marié. La perspective de ce qui peut arriver à mon enfant et à sa mère est pour moi un tourment de tous les instants. Je n'en dors plus. Cette pensée empoisonne ma vie.

From such fathers we pray that we may be spared, for well we know that their whining repentance means little, and that when we grow up with the signs upon our bodies and in our minds of a parent's fall, they will not look upon us with pity, but with loathing, even as we also look upon them. Neither do we wish to have anything to do with the mother—we blush for her—who doses herself and us with noxious oxytocic drugs at the second and third month of pregnancy in order that she may be saved from what she regards as the irritating interference and exasperating suffering of child-bearing. Such conduct makes our pulses throb with righteous indignation from the foramen ovale to the very tips of our chorionic villi. We confess that we are absolutely unable to understand the attitude of a mother who will do such a thing "avec le cœur léger," and who will on another occasion shed floods of tears and become hysterical with grief over the dead body of a month-old baby, or, *horribile dictu*, of a favourite dog. Some of us hope to be mothers ourselves some day, and we trust we shall not be so illogical, not to say wicked, as to act in such a manner. We do not prefer to have as parents individuals who are tuberculous or predisposed to tuberculosis, who are congenitally deformed, or who belong to a stock in which cancer and insanity have been frequent incidents; but we do not absolutely refuse to admit their rights to paternity and maternity so long as they are themselves clean-living and right-thinking folk, for we have a great belief in the tendency of the germ-plasm to return to right physiological paths if it only get a fair chance. We think that much of the evil that is done to the germ in one generation may be undone in the next, but of course with great difficulty, for *facilis descensus avari, sed revocare gradum hic labor hoc opus est*. We do not particularly object to having first cousins as parents when they both have a clean bill of health, but we do not wish to be the public demonstration of the intensification of morbid processes which will result if they have not. Finally, we formulate our claim and state our right to be engendered by self-respecting individuals, to be conceived in soberness, and to be developed under healthy conditions of intrauterine life.

I do not think that these claims of the unborn can be regarded as excessive. In them are stated many facts and phenomena of intrauterine and intraglandular existence which ought to be widely known, and the lessons of which are obvious. At the same time I think that all attempts to regulate marriage by law in the way that has been so often suggested of having a sort of bureau of inspection of candidates for matrimony must be regarded as premature at least, if not founded actually on a wrong principle. At present it must be confessed that public opinion judges of the suitability or unsuitability of a proposed marriage very much by the amount of money the young couple will have to live upon. It would be better if a basis of health were to take the place of a basis of wealth in the public mind. The young contracting parties often say they are marrying for love, and that is right enough so long as love is not spelt *lust*, but with them also it is to be feared that physical and mental and moral health does not take the high place it ought to do in determining the union.

A writer¹⁰ in one of the most advanced of American periodicals said that he believes—

That in a future purer and brighter day the race will look back upon the long night of triumphant animalism, with its generations of passion, with much the same feelings of loathing and disgust with which we view the cannibal.

This may be so, but I think that the writer expects too great and too immediate results from the experiment which he suggests in the following passage:

If too young men and women in this land, realising the solemn import of this question, enter the marriage relation attracted by pure love, untainted by base or sordid considerations, and recognising the great moral responsibility they assume to the society of to-morrow, no less than the sacred obligation they owe to the unborn, we should have from these true, pure, and ideal unions children who would, I believe, inaugurate an ethical reformation that would awaken the moral energies of civilisation and lead to a higher and truer order of life.

This may be brought about ultimately; but in the meantime, and before it can be hoped that it may be accomplished, it is necessary that a healthy public opinion on what constitutes a good marriage be built up, and in the building up of this opinion the profession is expected to act as a guide and

leader. What, for instance, has the profession to teach the public on the question of marriages of consanguinity? This matter has been rendered most uncertain by the confusion which has been introduced through the mixing up of two very different states—namely, the marriage of near kin or incest and marriage of consanguinity or of cousins. In the former case there can be no doubt of the evil effects, and every breeder of domestic animals will support this assertion; but the marriage of cousins is a different matter. It has been stated that such marriages result in sterility, abortions, congenital deaf-dumbness, idiocy, retinitis pigmentosa, albinism, and such malformations as polydactyly and ectrodactyly. Now, it does not seem that consanguinity *ipso facto*—that is, without the existence of traces of pre-existing degeneracy in the contracting parties—increases the risk of these diseases and anomalies. Féré goes further, and says that in good families it is to be sought for, not avoided; but the medical man will be well advised if he refrain from proffering such advice unasked.

Another question that the profession must be prepared to answer is, To what extent may marriage into a good stock correct the tendency to degeneration existing in a bad stock? The case of the marriages of the imperial house of Russia has been cited by Dr. Ireland.¹¹ Perhaps the safest view to take of such unions is that the good risk to lose more than the bad risk to gain (Féré).

The consideration of what constitutes a good marriage cannot be concluded without a reference to the spectre of morbid heredity, so obtrusively prominent in modern literature of the Ibsen-Zola present-day novelist type. There are some—they constitute the minority, I think—who treat this matter lightly. For them the question has no terrors; every man has his chance.

Years roll'd on years successive glide,
Since first the world began,
And on the tide of time still floats,
Secure, the bark of man.

But there are others, and their number in these days is great, to whom morbid heredity is a spectre that will not be laid. It looks at them out of their children's eyes, they see it in the flush upon a daughter's cheek, they hear it in the night shriek of their rachitic offspring. All day long it stalks through the house, and in the still hours of darkness the rustle of its garments (cerements are they not?) is to be heard. An unreasoning terror seizes them, and they say like one of old time: "Fear came upon me, and trembling, which made all my bones to shake. Then a spirit passed before my face, the hair of my flesh stood up; it stood still, but I could not discern the form thereof; an image was before mine eyes, there was silence." They are paralysed, are these fearful ones, and a gloomy fatalism overpowers them. They are for ever talking of the relentless anger of outraged Nature; they constantly speak of the visitation of the sins of the fathers upon the children, and they generally mean that the sins of their father are being visited upon them, and rarely that they fear that their own sins will be visited upon their children.

To all such I preach the gospel of hope. I do not require them to take the message on trust, but I simply ask them to look around with eyes that observe. I call upon them to stop focussing their gaze upon the dark places in the picture, and to give a little attention to the bright ones. There is not an all-pervading gloom, there are flashes of light here and there already, and they grow more numerous with the looking. Those who are so fearful of morbid heredity begin to realise that the most hereditary thing in the world is the normal, not the abnormal; that health is transmitted as well as disease; that even where the past history of the family is bad, the clean livers have handed something to their children that is better than what was handed on to them.

NOTE AND REFERENCES.

¹ Shuttleworth in Hack Tuke's *Dictionary of Psychological Medicine*, ii, p. 675, 1892. ² *Loire Méd.*, December 15th, 1898. ³ *Trans. Edin. Obstet. Soc.*, xix, p. 105, 1894. ⁴ *Legal Medicine*, ii, p. 253, 1883. ⁵ *Semaine Méd.*, xviii, p. 481, 1898. ⁶ *Trans. Amer. Gyn. Soc.*, xiii, 1888. ⁷ For example, intracranial hæmorrhage in the fetus in cases of typhoid fever in the mother, as reported by Osler, *Teratologia*, ii, p. 13, 1895. ⁸ Author, *Internat. Clinics*, 6 s., vol. iv, p. 262, 1897. ⁹ A. R. Simpson, *History of Embryulcia*, BRITISH MEDICAL JOURNAL, December 13th, 1884. ¹⁰ B. O. Flower in the *Arena*. ¹¹ *The Blot on the Brain*.

A SYSTEMATIC BACTERIOLOGICAL EXAMINATION OF THE FAUCES IN SCARLET FEVER AS A MEANS OF PREVENTING POST-SCARLATINAL DIPHTHERIA.

BY
G. C. GARRATT, and J. W. WASHBOURN,
M.B.CANTAB., and M.D., F.R.C.P.,
Assistant Resident Medical Officer Physician to Guy's Hospital;
to the London Fever Hospital. Physician to the London
Fever Hospital; etc.

In hospitals for infectious diseases patients convalescing from scarlet fever are not infrequently attacked with diphtheria. The cause of this has been the subject of considerable discussion; but a prevalent theory is to attribute it to the introduction into the scarlet fever wards of unrecognised cases of diphtheria. If this view be correct, it follows that post-scarlatinal diphtheria could be prevented by the early recognition and isolation of such cases. The great difficulty encountered is that the clinical diagnosis of diphtheria is often impossible, especially in patients who are in the acute stage of scarlet fever.

The only other method available for the recognition of the disease is the detection of diphtheria bacilli in the fauces by bacteriological examination. It has, however, been urged that diphtheria bacilli are so frequently present in the throats of scarlet fever patients as to render the isolation of such cases impracticable. F. Ranke¹ found diphtheria bacilli present in the throats of 53.7 per cent. of scarlet fever patients in Munich. Goodall² made a bacteriological examination of 87 cases of scarlet fever admitted into the Eastern Fever Hospital. The examination was made immediately after admission. In 6 diphtheria bacilli of the long variety were found, and in 13 bacilli of the short variety. The cases with bacilli were mild, and would not have been recognised clinically as diphtheria. One of the cases with the long variety of bacillus subsequently developed post-scarlatinal diphtheria, and so did 4 other cases in whom no bacilli were found on admission. Sverensen³ examined 1,547 scarlet fever patients on admission into the fever hospital at Copenhagen, and found diphtheria bacilli in 2.5 per cent. Beggs⁴ found diphtheria bacilli in the throats of 51 out of 140 cases of scarlet fever examined, but the examination was made at various periods after the admission of these patients. Moreover, post-scarlatinal diphtheria was at the time prevalent in the wards, and 14 out of the 51 cases exhibited clinical evidence of the disease. The difference in the results obtained by these observers may, perhaps, be partially explained by the inclusion by some and the exclusion by others of Hoffman's bacillus.

In consequence of an outbreak of post-scarlatinal diphtheria in the London Fever Hospital during the winter of 1895-96, which necessitated the closing and disinfection of some of the wards, it was decided in March, 1896, to examine bacteriologically the throats of all scarlet fever patients then in the hospital, and of all new cases on admission; of the former, those in whose throats diphtheria bacilli were found were isolated.

Our present communication is a record of the examination in this way of all cases of scarlet fever admitted under our care since the above date, our object being to determine, first, the frequency of the occurrence of diphtheria bacilli in the throats of scarlet fever patients; and, secondly, the possibility of preventing post-scarlatinal diphtheria by the isolation of those cases in whose throats these bacilli are found. The cultivations were made upon Loeffler's blood serum, and were examined microscopically on the following day.

Bacilli of the diphtheria family may conveniently be divided into three groups:

1. The Klebs-Loeffler, or true diphtheria bacillus.
2. Bacilli resembling the above in morphological and cultural characters, but non-pathogenic to guinea-pigs.
3. Hoffman's bacillus.

We have discarded the term "pseudo-diphtheria bacillus" because it has been used in different senses by different authors. The distinction between the first and second groups depends mainly on the question of pathogenicity. This test was applied only to the bacilli of cases already in the wards in March, 1896, but it was not found practicable to continue