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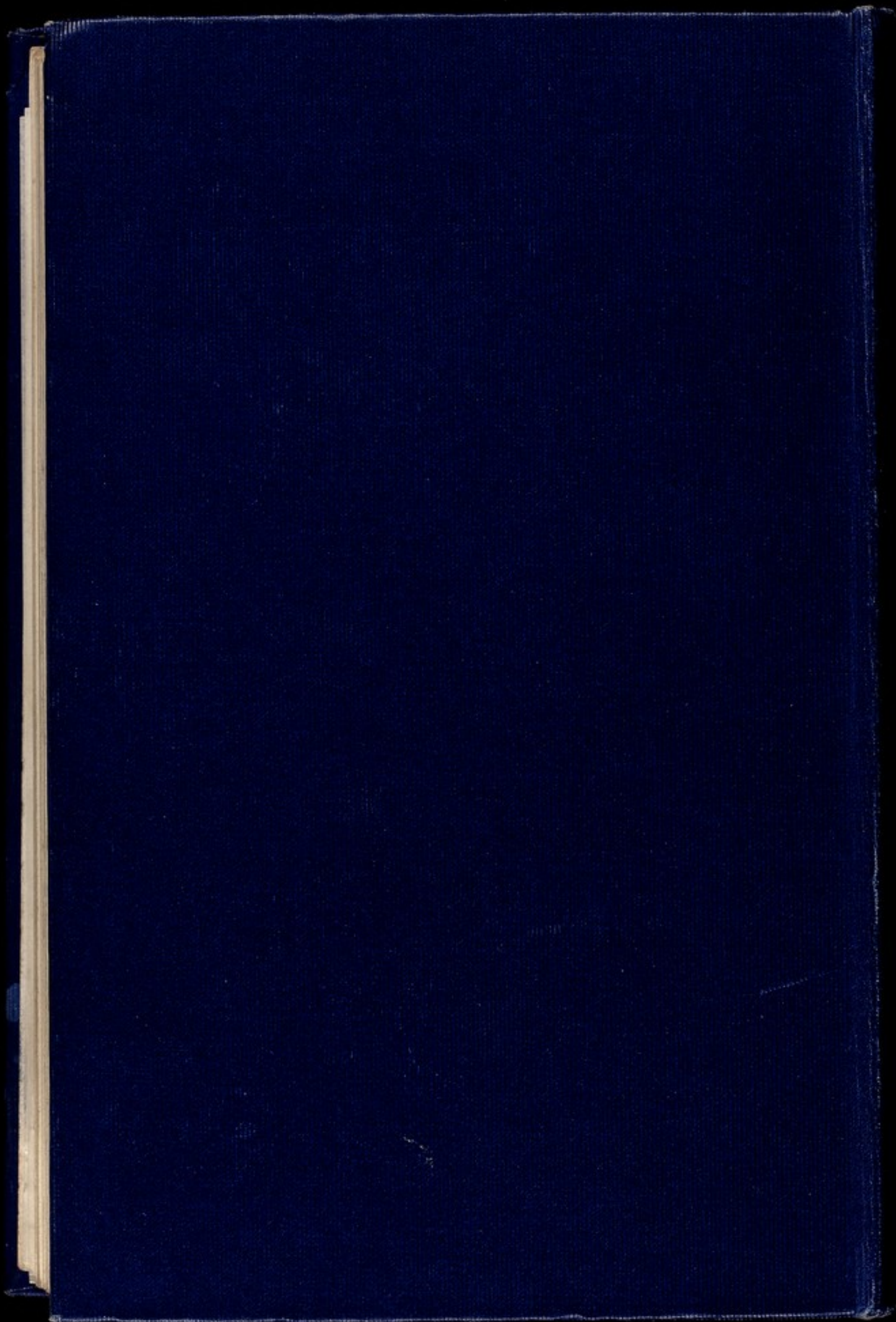
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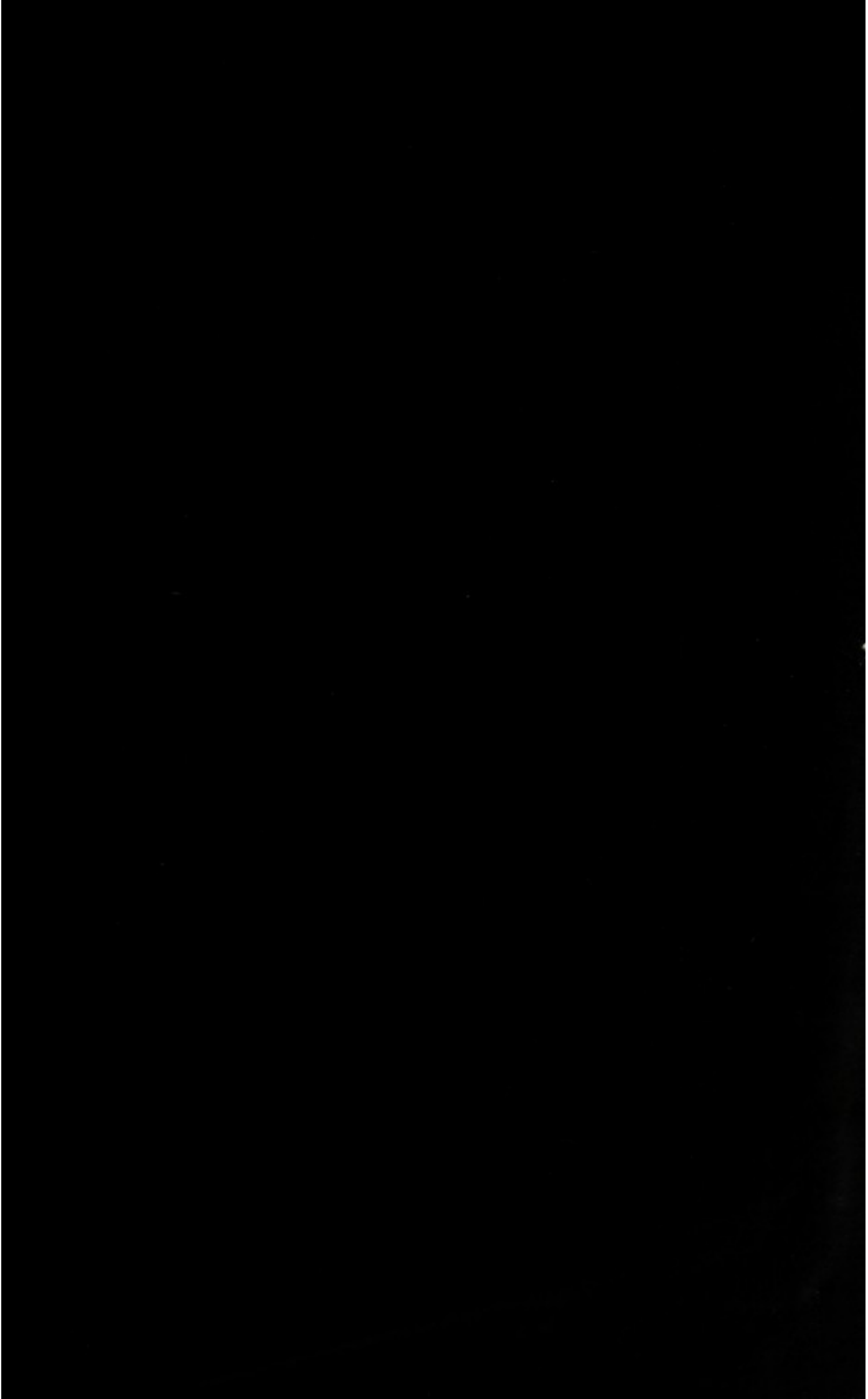
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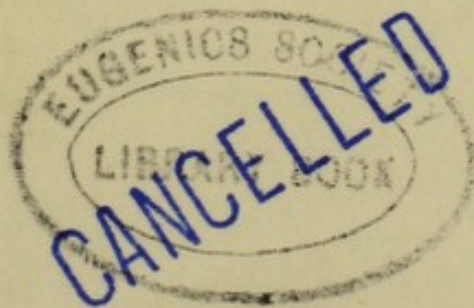


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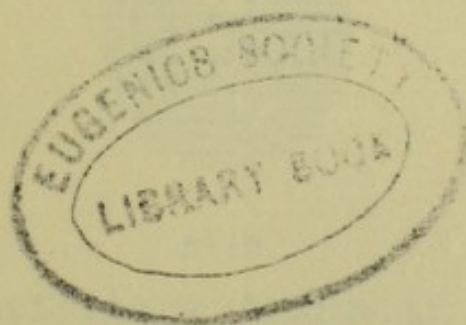


IDEAL BIRTH  
HOW TO GET THE FINEST CHILDREN

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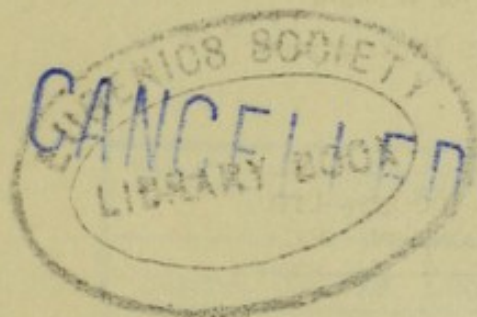
# IDEAL BIRTH

HOW TO GET THE  
FINEST CHILDREN

BY

**TH. H. VAN DE VELDE, M.D.**

AUTHOR OF "IDEAL MARRIAGE," "SEX HOSTILITY IN MARRIAGE,"  
"FERTILITY AND STERILITY IN MARRIAGE," "SEX EFFICIENCY  
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1935

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IDEAL BIRTH  
HOW TO GET THE  
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## TO THE IMAGE OF MARY ON THE OTHER SIDE

Here I suggest that a word picture of the Madonna is better than one created by pencil, brush or chisel. It leaves everyone the chance of amplifying it by his own imagination, according to his own conception. And, too, in a word picture, the traditional ecclesiastical character is absent and it expresses better what is universal in the figure of Mary.





## Mother Mary

But Mary walked to the choir stalls  
And took a seat, her hair dark intermingled  
With the dusky leaf-work of the carven chair.  
Her azure dress fell open in front  
And a light flush stole over  
The half-bowed, high white brow.  
Then suckled she the Child.

With tiny hands,  
The boy groped for the full bosom,  
The soft bud of his sweet moist mouth  
Clung to her breast which, with pale fingers  
The woman gently towards the child outheld,  
Which drank and drank and looked with deep love  
Up to the Mother who blissful smiled  
With dark lashed, sweetly dreaming eyes.

From "*Mother Mary*,"

by BÖRRIES FREIHERR VON MÜNCHHAUSEN.

Instead of a painted picture of Mary.

DEDICATION

TO MOTHERS AND PROSPECTIVE MOTHERS

MOTHER MARY—symbol of divine motherhood, in her divinity *and* humanity, linking mankind with the highest, the eternal.

Mother Mary—here, too, the symbol of terrestrial motherhood and of all that seems lovable and holy in woman and the eternal feminine—symbol of the highest in mankind and symbol of the link between every human being and the infinite, the eternal.

TH. H. VAN DE VELDE.

VAL FONTILE,  
MINUSIO.  
*October, 1935.*

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## INTRODUCTION

THE community—the State—is making greater and greater efforts to improve the mass of individuals, the nation in its basic constitution. It—the State—proceeds by various paths to this end. It opposes the interbreeding of too greatly divergent races. It promotes the birth of as many favourably predisposed children as possible. It tries to keep down the birth-rate of inferior people predisposed to disease or crime. For this purpose, it introduces authoritative measures; sometimes very strict, sometimes very lenient. And, further, it endeavours by explanation and persuasion to increase the consciousness of responsibility of its citizens with regard to propagation.

There can be no doubt that these endeavours may be crowned with considerable success, and that the prospect of success is all the greater when the State inspires its citizens with enthusiasm for itself and its aims. If the members of a community feel themselves to be in the first place part of higher organism and only in the second place individuals, they will, in this respect too, accommodate themselves to the really vitally important interests of the State.

The sentiments that govern the propagation of human beings are, however, of such a personal nature that it is advisable to appeal to the self-interest of individuals when it is a question of inducing them to improve the quality of their offspring as much as possible. It has to be made clear to them that not only the whole nation requires it of them, but also that the sense of responsibility towards their fellows and their mates in marriage and, above all, their future children, demands it. In this way, also, pure self-interest should induce them to bring healthy children fitted for life in every respect into the world.

The interests of the community, sense of responsibility and self-interest are in this respect absolutely parallel. } 2



Hence it is important that there were not only works on eugenics which strive for an improvement in the race from the point of view of the interests of the community, but also a book which gives an exposition from the standpoint of the personal fate of the beings yet unborn.

This exposition will give the reader, especially the woman reader, an impression of what can be done, and what must be avoided, to endow the children they want to have with as many favourable and as few unfavourable qualities as possible for use in their future lives.

Whilst writing the first chapters of this book more than four years ago, I did not then choose its title solely with regard to *this* significance. On the contrary, I made and am making use of the several meanings attached to the word birth. For it is not only important that the child should be born in an ideal condition, that is, put into the world equipped with good qualities. It is equally important that the mother should give birth to it ideally, that is, in the most favourable way. This is important for the child in order that it may get no injury at birth; and it is also important for the mother in order that she should not suffer more than is necessary. It is further of greatest importance for the family already in existence, and for the children to come later, that the mother should preserve her full efficiency. And, finally, for all these reasons, the community, the State, is not less interested in the ideal birth (in the active sense of the word) of every woman than in that (in the other sense) of the children. The loss in strength of the nation which goes on year after year owing to avoidable disease and death resulting from pregnancy and childbirth is appallingly great. And the amount of suffering which women might be spared is not less great. To know that they can be spared most of this suffering and how this is possible will be a relief to many women.

Hence, I am giving in the second section of this book, an explanation with regard to conditions and powers which guarantee, or at least promote, ideal birth for women.

What class of readers am I thinking of? In the first place, wives who are sufficiently well developed mentally to



understand what is essential of the explanations given. Then the husbands of the same stage of development; for it is just as important for them to have ideally born children as for their wives, and not less important that the latter look forward to an ideal confinement. Indeed, I would like to see the book even in the hands of unmarried people, so that, by reading the first three chapters, they will be convinced of the importance of the questions dealt with there. Further, it is intended for all those, such as midwives and nurses, who are to assist women during pregnancy, labour and childbed, as well as for those to whose social sphere of labours the questions treated here appertain. And, finally, I hope many doctors, too, may read certain chapters with interest, because they will find assembled and elaborated there many things which they would otherwise have to search out with considerable trouble from books and periodicals.

Bearing in mind this mixed circle of readers and, in accordance with the variety of questions having to be dealt with, the chapters are not all kept in the same style; treatment of a popular scientific character has had to alternate with some in a chatty manner. This naturally has certain disadvantages. I think, however, that the advantages are greater. Moreover, the book is not intended to be read straight through from beginning to end, and then put aside. Rather, after a preliminary survey of the whole subject, single chapters should be tackled separately.

Because of this desire to make each chapter intelligible by itself, I have not been afraid of certain repetitions. On the contrary, I have considered them not only unavoidable, but have consciously inserted them in some places because important points should be referred to more than once.

It may be pointed out to the reader who might here and there come up against passages which seem contradictory—and sometimes really are so—that in nature generally one comes in contact with many things of which one cannot see the drift, and that it is impossible for a thinking human being who tries to avoid short-sightedness and prejudice to consider everything from one point of view.

*Melanie & James*



I have not striven for completeness ; with the abundance of material, it was not possible within the scope of this book. On the contrary, I was concerned with emphasising things which are given less attention elsewhere. With regard to some questions, I have even laid stress intentionally on theories and possibilities which have not yet obtained satisfactory scientific support, because these views, even in the absence of cogent proof of their scientific rightness, seem to me of such great value regarded from the didactic standpoint that they may in any case hold good as " working hypotheses " in life.



# IDEAL BIRTH

## SECTION ONE

### IDEAL BIRTH WITH REGARD TO THE CHILD—HOW TO GET THE FINEST CHILDREN

#### CHAPTER I

CARE AND SELECTION OF THE GERMINAL FACTORS (PRECONCEPTIONAL HYGIENE). FROM WHAT GERMINAL FACTORS DOES AN IDEAL CHILD PROCEED ?

“ Denn es erzeugt nicht gleich  
Ein Haus den Halbgott noch das Ungeheuer ;  
Erst eine Reihe Böser oder Guter  
Bringt endlich das Entsetzen, bringt die Freude  
Der Welt hervor.”

*Goethe, Iphigenia.*

MARRIAGE demands children. The community requires them. The impulse in the individual to continue his life in that of his offspring is, as a rule, very strong.

“ Of Death thou art afraid, would'st be immortal,  
Live to the full ! When thou hast long been hence, it remains.” 157

We need not fear death in order to desire to live our life to the full according to the words of the poet *Schiller* regarding this. But the community, the tribe, the family, marriage, the individual, not only want children—they want highly gifted and well-bred children who will become first-rate individuals in the sense also that they will be able to value their own life, so that they, as far as possible, may become happy people.

It would be wrong and foolish to maintain that the value



which the life of an individual has for himself and for others depends exclusively on the inherited disposition with which he has come into the world. Favourable tendencies become spoilt or take a wrong direction if their possessor does not develop them, or does so in the wrong way; unfavourable ones may, to a great extent, be redeemed by will and effort. It is, however, just as certain that the individual born with a favourable inherited disposition has much better prospects, and far more hopeful possibilities of shaping his life happily and usefully for himself, his environment and the world at large, than the individual endowed with unfavourable tendencies.

Every one of my readers no doubt knows that one's gifts depend to a very great extent on heredity. At the beginning of a book which treats of Ideal Birth, then, we ought to discuss the hereditary circumstances which will govern, or, at any rate, influence considerably the disposition of the future child.

Nevertheless, it is not within my purpose to write a more or less generally intelligible scientific treatise on the doctrine of heredity. This is unnecessary, for there are in existence many such treatises, short and long, simple and learned. And it would take us too far. In this book my aims are exclusively practical. In order to set them forth, I shall now and again have to explain, or at least try to explain, the laws of heredity which we have to rely on in the pursuit of these aims. I cannot manage this without using certain "learned" expressions, and I am not quite sure that all my readers will understand everything, although I try to elucidate those expressions and keep my arguments as simple as possible. Such readers, however, may rest assured that where those laws are not quite clear to them, our practical line of reasoning will, nevertheless, be quite comprehensible. And on this depends what has to be done, and what left undone, in order to make the inherited tendencies of one's children as favourable as possible.

The preliminary essential for the procreation of efficient children is the physical and mental soundness of the parents.



To fulfil this condition, every would-be parent should, in the *selection of a partner*, give particular attention to these fundamental qualities. Thus, it is important that the home conditions from which the spouse is to be chosen should be carefully observed.

With regard to as happy a marriage as possible, I have devoted to this question a book on fitness and unfitness for marriage. I might repeat here what I said there in respect of the best possible children to be expected. For all that makes an individual unfit for marriage also prevents the procreation of first-rate offspring; and every treatise which deals with physical and mental impediments to marriage holds good, too, in every respect for the question of impediments to propagation. I mean by impediments in this regard, however, not only the actual impossibility of propagation but also all well-founded objections to descendants.

All the serious forms of affections of the lungs and heart, of diseases of the kidneys, and diabetes in particular, all not completely cured diseases of the genitals and diseased conditions of the genital organs either do not permit of offspring at all or endanger directly or indirectly the children to come.

On the other hand, much that is to be valued positively in the sense of fitness for marriage, such as the sexual attraction of the married couple, the good health, good looks, equal social position, generally speaking, also affect their offspring beneficially.

What is true of the physical qualities applies also to the mental. Physical infantilism, disturbances in the sentient and impulsive life, hysteria, intemperance, abnormal characteristics, marked egoism, brutality, erotic aberrations, morbid jealousy, asocial conduct, moral defects—to mention only the most important—make unfit for marriage just as they offer anything but a guarantee of first-rate offspring. Apart from the fact that such natures usually show very little inclination for marriage, or the self-sacrificing bringing up of children, they are, by their example, the worst possible models for their children just at the



most impressionable age; instead, they are extraordinarily bad teachers who assist the development of the evil tendencies in their growing children rather than the good. Chronic drug addicts, such as morphine and cocaine addicts, opium smokers, hashish eaters, cannot beget healthy, high-class children; children begotten by habitual drunkards or conceived in a state of drunkenness are very often inferior. Although, in the case of drunkards, sterility sets in gradually, yet this generally supervenes after a fairly long period when more or less serious damage of the germ is to be expected. In an Italian table of statistics concerning 80,000 imbeciles and mental defectives there were found two summits of procreation which occur in Carnival and at the vintage! It is true, *Beethoven* came from a family of drunkards, and there are people of genius who are the offspring of psychopaths. Nevertheless, it would be a gross mistake to conclude that psychopathy and alcoholism fit people for the procreation of geniuses.

The aberrations of temperament, of character and impulse briefly mentioned here, in practice, mostly play a far greater part as regards offspring than the really serious mental disorders, just because they are far more common than the latter. Moreover, the question of begetting children in the case of obviously existing insanity will only rarely come into consideration at all. The decision is more difficult in the case of recovery from insanity. However, in these cases, too, we must almost always reckon with a menace to future offspring. This holds good, also, of some rarer affections of the nerves which, however, are usually under medical treatment, and the sufferers, therefore, will at least be warned about contracting marriage.

Of course, in this regard, we must not throw the baby away with the bath water and scare away candidates for marriage by excessive anxiety. It would be absurd to forbid a marriage when an individual shows a characteristic peculiarity which, on superficial observation, seems unfavourable but which derives from earlier occurrences and can be improved by psychotherapeutic treatment, and sometimes even by a suitable marriage itself. Only the whole



physical, mental, characteristic and social conduct and the weighing of individual tendencies against one another is decisive in such cases. Here we can follow no simple plan. If from mentally abnormal parents is produced a dwarf with water on the brain who becomes a painter of genius, an insane man who is distinguished as one of the greatest poets, psychopaths who have given us great dramatic works, a deaf man who created immortal music, we see appear, on one hand to be sure, the degenerative traits of the defective parent, but, on the other hand, also the fruits of the endowment of genius from the first-rate portions of the parental individuality. Although we are ignorant of why, in a particular case, these finely differentiated productive and creative beings evolve, and the number of inferior offspring of marriages of psychopaths far exceeds that of the high-gifted, yet there is no reason for an absolute pessimism in the case of not too great disturbances in any one parent.

In a certain sense, the deficiency in one parent can be counterbalanced by the good qualities of the other. Here we see the decisive point on the choice of a mate as regards the future child which, as we know, derives from *both* parents in common. Making a proper selection therefore seems doubly difficult, because not only the life happiness of the selector himself is at stake but also that of the next generation and even succeeding ones.

It is comprehensible without further discussion that the union of a healthy person with an incurably diseased one should not take place. Likewise that marriage should be put off at least until an extremely infectious disease, especially a disease of the genitals, is cured. With tuberculosis, too, the same holds good because the future child is exposed to the most serious danger. So, too, tuberculosis exposes the pregnant wife to increased risks and the husband to infection until the doctor has ascertained after long-continued observation that the disease has entered upon a safe stage.

Marriage is founded on the possibility of mutual sexual satisfaction and the production of healthy offspring. That



is, not only the wife but also the husband has a right to expect the partner to have sound, efficient genital organs. In this respect, also, any existing defects can often be removed betimes. Disturbances in the male procreative power should be put in order before marriage. As they are mostly of a psychical nature, this is done successfully by psychological treatment generally fairly quickly. Sexual frigidity in the wife is usually not apparent till marriage, but, likewise, mostly yields easily to treatment. Congenital under-development of the female genital organs can often, to a great extent, be put right and should also be attended to in time. The Viennese, *Dr. Bondy*, believes he has observed that deficient ovaries, whether the cause is in constitutional factors or in injury due to environment (food deficient in vitamins, climatic conditions, psychical influences, chemical poisons and physical injuries) may often be perceptible among the offspring in the frequent occurrence of individuals below normal in mass and height. Likewise he observed malformations and a certain kind of mental deficiency in children who obviously came from injured ovaries. Also he has not uncommonly observed ovarian tumours containing water at an early age in women born of mothers in whom a late development of the genital organs was proved—that is, an ovarian degeneration in two generations.

Altogether, it happens much more frequently than it appears that the organs of propagation remain stationary at a more or less childish stage. Although with timely diagnosis and treatment, a great number of these disturbances of development, and with them, too, their detrimental effect on marriage and offspring, can be put right. Here, too, an important task devolves of necessity upon the family doctor with a gynæcological training who can undertake with delicacy the examination in question when there happens to be an illness.

In choosing a mate then, if defective predispositions already exist, one must certainly consider whether these defects cannot be removed before abandoning the marriage which was in prospect. In the second place, however, it



must be considered whether the existing defects cannot be counterbalanced by attributes of the other partner. A few examples may be given : in beings of aberrant temperament, in the case of hot-blooded people with excessively strong feelings, in those at times abnormally depressed, singular beings and odd people, caution is certainly necessary. But particularly in highly gifted individuals the temperamental predisposition often leads to morbid symptoms. Now if the choice of a mate is not so made that the same qualities appear also in the other partner, opposite qualities may have a counterbalancing effect, and then this may have a really favourable effect for the offspring. A union of two persons with strong similar characteristics can, of course when added together, be harmful.

Hence, all that I have said in full detail earlier about choosing a mate might now be reconsidered in regard to the future generation, and people who enter into marriage with a sense of responsibility will, of course, do so. For a later training of the children cannot fully counterbalance mistakes made originally, cannot augment predispositions but only develop existing tendencies. The choice of a mate, in other words, must take into account the principles of *heredity*.

A well-weighed, well-advised choice of a mate has, as regards offspring, to avoid in particular marrying into an unhealthy family. In this, not only the outward form, the phenotype—as the outward appearance of the individual is called scientifically—of candidates for marriage is decisive but the persistent form of the sex concerned—the genotype—recognisable from the family history, must be gone into. This investigation will sometimes yield pleasant surprises by revealing very valuable capacities in the ancestors which ought, likewise, to be taken into account. On the other hand, concealed predisposition to disease which may quite unexpectedly come to light must also be taken into account if the family genealogy shows the occurrence of hereditary disease.

What a tragic effect a sin of omission in this respect may



have is clear from the numerous examples in which it is shown that two apparently perfectly healthy persons who have neither physical nor mental signs of a hereditary disease may, to their great horror, happen to bring into the world children who grow up to be insane, mentally deficient or epileptic. Then, if an investigation is made, the discovery is suddenly made that among the ancestors of one or both parents this disease had already occurred, a circumstance which had been forgotten in the course of time and had only appeared again in making a close investigation.

Now, how is it that physical and mental deficiencies or extraordinary talents reappear in children of apparently normal ordinary parents ?

Even among the lower species of animals and plants which consist of only one single cell, we see how the form and kind of the species are repeated uniformly in the next generation. These organisms still multiply sexlessly—*i.e.*, not by the fusion of two germ cells but by simple division of the mother-cell, which splits into two daughter cells. Here the process of heredity is consequently also a very simple one.

The higher a living being is organised, the more organs it possesses, the more complicated will the phenomena and laws of heredity be, since not only attributes of the individual as a whole but also attributes of each organ—yes, of each cell—are transmitted. The process of heredity turns out to be most complicated in the higher mammals and in men where, by fusion of spermatozoon and ovum in which the physical and mental attributes are held, the hereditary substance of two individuals, of father and mother, fuse in order to become the new being. At the moment when the sperm and ovum fuse, excellences and defects, good and bad tendencies are to a great extent predetermined for the new being. The whole later life and actions will be more or less strongly influenced by them, and the course of life of the new being pressed in a prescribed direction. In this sometimes the father, sometimes the mother is more dominant for the inherited tendencies, or for certain parts of them, so that the child, to give only one example,



may resemble the father in physique and the mother in character.

If it is borne in mind further that the hereditary substance of the parental givers is itself the result of two individuals of different tendencies and these again have received hereditary substances of their forefathers, then even the layman will understand that in the new being attributes and peculiarities of whole series of ancestors may be reflected, and that good or bad qualities of character, beauty and ugliness, health and sickness, make their appearance according as good or bad inherited substances from the families have been assembled. Likewise, it can be easily explained from these considerations that children show characteristics which cannot be observed in the parents but which have played a prominent part in the ancestors. In such cases, if it is a question of physical defects, then this is particularly dangerous if the parents are blood relations, that is, come from the same tainted family. Inbreeding, in these cases, has this unfavourable effect, for the reason that unfavourable hereditary substances are added together in the children.

Practically speaking, only the inherited tendencies of one generation are transmitted to the next, whilst the results of education, training, experience and influences of environment, at any rate to some extent, have to be acquired anew in each succeeding generation. Good and bad physical and mental tendencies and qualities are inherited in accordance with the same laws. Therefore, in the case of existing or likely defects, diseases or deficiencies, it must be considered whether they are to weigh lightly or heavily, and whether they are redeemed and covered over by predominating good qualities.

These indications are enough to show what an important part heredity plays in a proper choice of a mate and the conscious procreation of healthy, high-quality offspring.

Meanwhile, the following is to be borne in mind at the same time: the tendencies of a child are determined by heredity, but the course of development of these tendencies can be influenced by external circumstances.



Even as early as the time when the child is still in the mother's womb, these circumstances affect it. The position of the uterus, the position of and supply of blood to the child in it, the transmission of excitants of disease, hormones, poisons from the mother to the child, may alter the process of development resulting from heredity; and may promote, check, shape favourably or perversely the course of the inherited tendencies. The mental and physical mode of life of the mother during pregnancy is, as is being assumed more and more, likewise of great importance in this. We shall come to speak of this more fully in Chapter III. According to the statements of several doctors, it is even said to be possible to prevent, by treatment of the mother, the development of hereditary malformations in the child in her womb. In the year 1880, *Burnett* reported on families where harelip and cleft palate were hereditary, and where, by suitable medical treatment of the mother during pregnancy, he was successful without exception in procuring the birth of normal children. *Burnett*, who used homœopathic treatment, got his inspiration from *Tuckey*, who already, in 1878, successfully treated the mothers in such families during their pregnancy with a mixture of the salts occurring in the bones, and banished both harelip and cleft palate from the families. Still earlier, *i.e.*, in the year 1865, *Grauvogel*, according to his statements, obtained good results in preventing hereditary "water on the brain" by treatment of the mother during pregnancy. Although such reports are received on many sides with scepticism, yet their accuracy gains in probability from the fact that the homœopaths everywhere in the world are never tired of extolling the good effect on development resulting from heredity of homœopathic treatment of the mother during pregnancy.

The course of development of inherited tendencies after birth is also dependent on external influences. In tuberculosis, only the predisposition is inherited. The development and course of a possible attack is, to a great extent, dependent on external influences. In diseases of metabolism, in so-called diseases of excessive sensibility, asthma, hay-fever, the tendency, to be sure, is inherited, but for the



disease to arise, external stimuli and an unsuitable mode of life in the sufferer are necessary. In cancer also, the predisposition resulting from it is probable in many cases; however, here, too, it seems to be established that only the tendency to the morbid processes of metabolism is necessary for the rise of the malignant growths, and that by suitably regulated ways of living, it is possible for the tendency to the disease resulting from heredity to be checked and, indeed, even wiped out. In hereditary diseases of the nervous system, according to *Spielmeier's* view, no defect or bad constitutional disposition of the nervous system itself is transmitted, but a disturbance of the metabolism, for example in the familial feeble-mindedness with blindness, it is a question of disturbances of the lipoid metabolism with infiltration of finely granular fatty substances into the nerve cells. As in this case, so it might be in many other hereditary diseases that, instead of the bad constitutional disposition of the anatomical structure, only the predisposition to a wrong function of the organ or of a system of organs is inherited—a disturbance in the removal of which the possibilities of medical science are incomparably greater than in the endeavour to influence the morbidly degenerate structure of a defective congenital organ or system of organs. We are acquainted, too, with numerous diseases, the origin of which is to be traced to no slight extent to inherited factors, and which, nevertheless, are completely or at any rate to a great extent curable. As examples, I may mention rickets, Graves' disease, diseases of the kidneys, gastric ulcers, congenital dislocation of the hip, which are, in many cases, due to inherited predispositions. The fight against physical afflictions in the realm of orthopædy, for instance, congenital dislocation of the hip, should, in these cases, as a rule, be carried on by treatment and cure and only in very few cases by suppression of the offspring; their prospects of cure can, with early treatment, be said to be good; on the other hand, the knowledge of the transmissibility of these diseases is so little authenticated that it is by no means sufficient to prohibit marriage or propagation to numerous individuals without distinction. Altogether,



we have to be very careful judging any disease to be incurable. Progressive softening of the brain, pernicious anæmia, diabetes in children, were fatal until recently, and yet medical science has succeeded, though not in curing every case, yet, in most cases, in making practically healthy those afflicted with these diseases.

On the other hand, in spite of the prospects of cure getting better and better with the advance of medical science, it is a fact that we can unfortunately in many cases exercise almost no influence at all on some inherited predispositions. Even the cured victim of an inherited disease will transmit his predisposition to the disease—a fact which, in spite of all the opinions put forward, we must ever keep in mind from the point of view of scientific advice in marriage with regard to the healthiest possible offspring, mentally and physically.

Of the promulgators of the doctrine of heredity, I may mention here—whilst I make reference in passing to others no less great, such as *Weismann* and *Galton*—*Darwin*, *Gregor Mendel*, *Hugo de Vries* and *Johannsen*: *Darwin*, who brought into alliance the ideas of *evolution* and knowledge with regard to breeding, and thus first with ingenious experiments established the laws of heredity. *Gregor Mendel* who, as the result of his experiments in hybridisation on plants, expressed a number of principles of heredity. *Hugo de Vries* who observed the occurrence of *fresh* hereditary characters called *mutation*, and *Johannsen* who demonstrated the difference between the *genotype*, *i.e.*, the sum of *all* inherited qualities and the *phenotype*, *i.e.*, the sum of the inherited qualities realised in the individual.

The *difference* between the offspring and its ancestors is called *variation*. With *Erwin Bauer*, we distinguish between paravariation, mixovariation and idiovariation. Paravariation is the deviation from the parental type, which is due to the influences of environment in so far as they operate from the moment of the impregnation of the ovum till death. Food, climate, mode of life, education, social environment, disease, poisoning by infection, all this has power to shape the



individual particularly, to change his qualities in relation to his ancestors, to add to or diminish them. If two children with similar inherited characters grow up in different surroundings and have quite a different education, then, when grown up, they will differ considerably. But whether all the good or bad acquired by external influences can react upon the determinants is another question.

Mixovariation is due to the mingling of the paternal and maternal inherited characters by which the most varied inherited tendencies may be united. Since the parents themselves are vehicles of the most varied inherited characters, inherited qualities may appear in the children which are present in the parents only in latent form, that is, not externally recognisable. This circumstance occurs very readily where the parents are kin and transmit the accumulated good or bad tendencies. Although both sexes have the same power of transmission, yet of two inherited tendencies in one child which have been transmitted by the parents, one may be quite hidden by the other; very often, unfortunately, it is just the bad tendencies which are concealed and hence overlooked, to emerge again in the descendants.

Idiovariation, or mutation, is the term applied if, for example, a beech tree suddenly grows up with red foliage and becomes the parent of all red beeches. *De Vries* discovered the mutation in the evening primrose (*Oenothera*). *Morgan's* investigation of hereditary transmission in the fruit fly, and *Baur's* in snapdragon, show that idiovariation is a comparatively frequent occurrence, but in individual species is of varying frequency. We have reason to suppose that the peculiarities in the agglutination of the red corpuscles in the blood plasma of different individuals, by reason of which we differentiate four blood groups, can be traced to the mutation of the germ element which people of the blood group O still possess. Only it is questionable whether the mutation of this so-called gene of Group O took place before the separation of human beings from the anthropoid apes or still earlier in the history of the race. To-day, we know that mutations can be produced by special



influences, above all by Röntgen rays, and although certainly an infinite number of mutations are pathological or even lethal (incapable of continuing to exist), there are undoubtedly also mutations which should be advantageous to the organism. The upwards evolution of the species would not, however, be conceivable by mutation alone, but by the co-operation of mutation and selection.

The laws of mixovariation were established by *Mendel* in hybridisation of plants. In a plant which has red and white flowers we get, by crossing a red with a white flower, a pale pink flower with red and white inherited characters. The red and white flowers are pure bred—homozygous; the pale pink flower with the two different inherited characters red and white is hybrid—heterozygous. If two of these pale pink flowers are crossed, we get red, pale pink and white flowers in the proportion of 1 : 2 : 1. The red flower, that is to say, has purely red blooming inherited characters, the white flower purely white blooming ones; the pale pink, half white and half red characters. Now, when two pale pink flowers are crossed, red and white, and combined with red and white, this gives red and white; that is, with red flowers, red and white, *i.e.*, red-white—pale pink; white and red, *i.e.*, white-red—likewise pale pink and white and white, *i.e.*, white. By this combination, the proportion 1 : 2 : 1 is clearly established. This is how the matter stands if the red flowering and white flowering characters are equally strong in their influence on the offspring. However, if one character is stronger (it is then called dominant) and the other character suppressed (this is called recessive), then, if the red flowering character is the dominant and the white flowering the recessive, there results from crossing a red and white flower not pale pink, but pure red flowers which, however, have two characters, red and white. Now, if we cross two of these red flowers which contain two unlike characters red and white, then again red and white are combined with red and white and we get, as before, red and red; *i.e.*, red homozygous flowers and red and white with white and red which, however, do not now become pale pink, but red because red is dominant



in transmission, so that, in this case, we have to speak of red, but heterozygous flowers ; finally, white combines with white as well to homozygous white flowers. Thus, in this case, there arise two red flowers, three red and one white, which seems startling at first sight since this white child has a character which cannot be guessed in its parents if their lineage is not known.

The transmission of sex, of the peculiarity of personality and of predispositions to many diseases, follows *Mendel's* laws, as this kind of transmission is called, after their discoverer. If one reflects that the innumerable inherited characters of the human being, the colour of the hair, of the skin, of the eyes, the bony formation, talents, mental characteristics, individual traits of character, in short all his qualities, can each for itself follow independently *Mendel's* laws, we see that the possibility of varying individual yet always inherited peculiarities is unlimited. Somehow, something of a long-forgotten peculiarity, physical or mental, of some ancestor can be transmitted to the child, and by the operation of *Mendel's* laws, a characteristic can make its appearance and is, at first sight, almost inexplicable but, in reference to *Mendel's* laws, comprehensible. If in this it is a question of biopositive characters, *i.e.*, characters favourable for life, *e.g.*, special talents, this is felt to be very agreeable, but if bionegative factors such as physical imperfections or signs of mental degeneration develop, then follows the disaster of bringing up and maintaining children of poor quality, mentally and physically--a disaster which, with proper consideration of the ancestors, that is, with a little reflection and rather less irresponsibility, might, in many cases, have been avoided.

Delicate health, inferior qualities and particularly the tendency to these are transmissible ; but *equally so are most good physical and mental capabilities*. Certain inheritable characters are attached together so that they are transmitted only together. Thus, for example, tendencies to many diseases attached either to the male or to the female sex make their appearance only in the one sex, though they can be transmitted by others not affected by them.



Particularly well known is the transmissibility of hæmophilia, a disease which is the subject of the Swiss writer, *Ernst Zahn's* novel, "Die Frauen von Tannö." An apparently quite healthy woman gets with a perfectly healthy husband boys who bleed excessively with the slightest injury. The wife's mother is healthy, apparently also her own daughters, but the father has suffered from this disease, which then lost in danger with advancing years. Every male descendant is afflicted with the disease; it is transmitted to the male descendants, while the female members of the family are spared. The disease is associated with a lack of coagulating power in the blood, and *Nägeli* was able to show that the apparently healthy women who transmit the predisposition to this disease themselves also showed slight signs of its existence, as they have a reduced capacity of coagulation of the blood as compared with a healthy one; but, with them, it does not express itself in a morbid tendency to hæmorrhages. On the other hand, it is possible that if a man affected by hæmophilia marries a woman transmitter from a family affected by hæmophilia, from such a doubly tainted alliance females affected by hæmophilia might result: such cases, however, are rare, as the child dies generally *in utero*.

Also, the harmful effect of inbreeding, frequently maintained and sometimes actually observed, can be explained by the Mendelian laws. If a tendency to disease is suppressed (recessive) when transmitted, then it is clear that this disease will only make its appearance if this recessive tendency is present in both parents. Now the probability of this occurrence is greater in marriages between relations, in which husband and wife might more likely than is otherwise the case have ancestors afflicted with the predisposition to that disease. The recessive factor, suppressed in transmission, is in such a case directly brought into expression in accordance with *Mendel's* theory—an occurrence which in some circumstances is directly catastrophic for morbid tendencies; the reverse for good tendencies, however, can also be of importance from the point of view of eugenics. A limited inbreeding—marriages not so much between blood



relatives as between individuals of high eugenic value, of similar social position, well endowed mentally is preferable—is advocated by His, among others. Breeders of animals also know that inbreeding never means weakening of outstanding hereditary tendencies, rather strengthening them. There is a danger only when strengthening them seems no longer possible, or if morbid tendencies and determinants are inherited with them. According to the present stage of our knowledge, then, a marriage between kin will not be disadvised with regard to the general dangers of inbreeding if, in the whole circle of relatives comprised, no serious transmissible afflictions are present. On the other hand, it is decidedly to be advised against should there be among the parents or brothers and sisters persons who are affected by serious inherited affliction: likewise, if such inherited afflictions occur among the grandparents common to both husband and wife. The opinion that inbreeding makes the resulting children less vigorous and less productive is contestable.

The inheritance of inferior mental predispositions and disturbances is particularly dangerous and of practical importance. These need not necessarily be transmitted in the same morbid form from parents to children and grandchildren, but show quite different types of appearance in the same family. Thus, an excessive drinker with psychopathic tendencies may beget really insane offspring as well as offspring with nervous affections and degenerates of any kind.

A typical example illustrates excellently the terrible effect of the accumulation of harmful transmissible substance. A harmless good-natured habitual drunkard of good intelligence married a cousin who was only a little deaf. In the course of the marriage the husband began to drink harder and the wife gradually become totally deaf; nevertheless, the marriage, of which numerous children were issue, was for a long time very happy. Then the misery began. I will spare my readers the horrible details. Of five children, four ended in the asylum or in prison, and the fifth became totally deaf. Owing to these reverses also, the



family and conjugal life was completely ruined; the husband, to forget his woes, took more heavily to drink and died in delirium. This tragedy took place not in the lowest ranks of the proletariat but in a good family. Although in many other cases it does not come to such a ruinous accumulation of bad inherited factors, yet this example should be a warning. Similar abnormal phenomena of the mental life can be observed also in the children of syphilitics. Interesting but very sad results develop in the offspring from the combination of hysteria in the wife and melancholia in the husband. Cases can be observed in which the children of such a marriage become hysterical for a time but later predominantly melancholic. Here the law of heredity in the mental transmissible factors of the parents is demonstrated in a particularly striking manner.

We must also regard as unfavourable transmissible mental, characterological qualities—at least, when they are perceptible in very strong degrees—an asocial attitude to life and fellowmen, psychopathic irritability and a passionate disposition, fanaticism, quarrelsomeness, instability and amorality, phenomena of uncontrolled cravings, inordinate lying and abnormal imagination and tendencies to depression: all conditions which are not pronounced diseases of the mind, but belong to the mental and characterological borderline states which can by way of heredity, in mixing with other unfavourable factors, be transmitted considerably aggravated. Impressive figures show that inferior individuals, degenerates, psychopaths, criminal individuals and those afflicted with hereditary disease are unfortunately extraordinarily fertile as well, whilst those of high value physically and mentally, from their sense of responsibility, bring fewer children into the world. We all know the American statistics of a brothel keeper who died in 1827, from whom, after exactly 100 years, 800 direct descendants could be traced, of whom 87.5 per cent. were punished, thirty-seven even with death. A similar case is the statistics of the descendants of a mentally inferior tinker, whose direct descendants from 1888 to 1916 reached a total of



371 : 24 per cent. of these descendants died in early youth, the majority of the survivors consisted of criminals, drunkards, vagabonds and mental defectives.

In the foregoing statement, the discussion is more particularly of diseases which can be transmitted than of favourable qualities. The reason for this is chiefly that the laws of heredity can be demonstrated with special clearness in the morbid cases. I must, however, state with the greatest possible emphasis that a pessimistic view must not be taken from this statement. In the first place, many of the dangers of heredity belong to those inevitable risks of life to which we are exposed always and everywhere. In the second place, and this is the more important, the very fact that bad is obviously transmissible, imparts to us the knowledge of the transmission of the good from the forefathers to the children even where it sometimes remains suppressed (recessive) or appears to remain so because the inherited factors, for want of training or other causes, do not come to development.

The study of heredity, too, has been able to demonstrate that a whole series of desirable qualities are transmitted by the parents. To give only a few examples : single members of the various partial capacities of which musical talent is composed, especially the art of singing ; then mathematical talent and a technical bent, etc. These things, however, are little understood although the history of art knows many instances of outstanding hereditary talent in certain arts. Let us consider, for example, the *Van de Velde* family which, in the sixteenth to seventeenth century, produced quite a number of famous painters and etchers. The reason for our ignorance in this field of heredity is to some extent due to the fact that the predisposition to artistic abilities are often transmitted by hereditary factors on the maternal side where they were not in evidence, because much less attention altogether was formerly paid to the maternal ancestors.

Opposed to the ballast of manifest and imperceptible hereditary diseases, the race, too, has just as great a store of valuable excellences which are faithfully transmitted from generation to generation.



Not only transmitted but perhaps also added to ! I shall speak more fully of germ corruption later. For it, too, there is a consoling antithesis. Though in experiments with animals, the transmission of acquired characters may be very uncertain, we have in human beings, especially if we consider the whole history of mankind, certainly enough evidence of a higher development. At least, it would be inexcusable if each of us should not endeavour to suppress his own bad inherent qualities as far as possible, and to increase the good ones by training his special gifts and abilities. Since we know with scientific exactness a germ-deterioration due to external influences, we must logically assume also the possibility of a *germ-improvement*. This high training (the positive) is perhaps—no, certainly—far more valuable than the elimination of the bad (the negative).

I consider a germ-improvement and, in any case, the improvement of valuable characters by breeding, to be possible. Most authorities on heredity, to be sure, take the view that acquired characters cannot be transmitted. People continually refer to the experiment of the famous investigator, *Weismann*, who, for example, bred a family of mice through thirty-two generations and cut off the tails of each of these 1,592 animals. But not a single mouse of the offspring of the thirty-two generations came into the world without a tail ; indeed, their tails were not even a millimetre shorter than those of their ancestors. Physical interference therefore has no perceptible effect on the germ plasma.

However, there is also a series of experiments of the equally famous investigator, *Pawlow*—that *Pawlow* who first proved in dogs that the formation of the gastric juices depends less on the food actually given than on the accompanying mental impressions. Later, he even demonstrated in his dogs with a stomach tube that the formation of the gastric juices can be produced in quite the appointed combination when no food is given or displayed, but only the mental impressions associated with feeding time are acting. Since then, it is undisputed that mental forces evoke physical



processes and that for the individual life, these impressions also have a further influence as memory. *Pawlow* now asked himself whether this purely individually-acquired capability was transmissible. He, too, used for his experiments pure-bred mice which, by long and patient training, he taught to eat their food only at a signal from an electric bell. After more than 300 practices he actually succeeded in getting the mice habituated to this. And now came the surprise. The young of the mice thus trained became accustomed to the regular arrangement of meal-times much more quickly. Only 100 practices were required and the mice touched the food only when they had heard the signal. With the third generation the investigator had a still easier task. After thirty practices the mice were quite trained to it. The fourth could do it after ten practices. The fifth, however, were already so docile that after only five practices, the mice would not touch at any price the corn before them until they had been given permission by the signal. Although he did not succeed in breeding mice which, from birth, ate their food at the signal of the bell, yet there is no doubt that at least a formerly very weak aptitude was, by individual training, transmitted in ever stronger measure.

How is the contradiction to *Weismann's* experiment to be explained? The Viennese psychologist, *Missriegler*, pointed out that there is no contradiction. For in this case not physical modifications, but something acquired mentally, were transmitted. Only "experiences," only what has been "assimilated," "exists" in the individual, and only in this way can an influence on the germ plasma and, hence, of the future generation, take place.

Moreover, still other explanations can be conceived—even if one does not want to assume an actual transmission of acquired characters, notwithstanding that recent serologic experiments appear to tell in favour of its existence. *Van Herwerden* emphasises the possibility that inactive, dormant hereditary factors are enabled to come to activity by new conditions of life. The abundance of hereditary characters which form the soil which bears the edifice of the outward shape is so great, the number of those which actually help



to carry this edifice is so small in comparison, that an enormous number of those characters stay there unused, so to speak. Now if, as a result of training of other (acquired) characters, changes in the construction of the edifice of the outward form occur, then other hitherto inactive hereditary factors become fellow-carriers ; in other words, other hereditary characters are called in to contribute to bringing new forms to perfection. The basis of that which is apparently inherited is thus actually already present in the germ plasma of the ancestors, and, after this explanation, we should speak of a revived or resurrected rather than of an acquired character.

In addition, there is still the so-called "subsequent effect" to be taken into consideration. What is meant by this, the simple example given by *Van Herwerden* may show. If two bitch puppies from the same litter are fed very differently, plentiful food given to one and the other barely sufficient to sustain life, and later the strong and the weak animal are mated with the same dog, then an obvious difference between the litters of the two bitches will exist. In human beings, too, a subsequent effect of the condition in which the outward form lives can often be clearly recognised. Although this has nothing to do with heredity, yet it does show that the circumstances of life, inclusive of the characters which the parents have acquired, can have an effect—"subsequent effect"—on the children.

Now, whichever explanation of the phenomena which simulate a transmission of acquired characters is the right one—I consider them all jointly correct and, moreover, the possibility of an actual transmission, also, by no means improbable—in practice it all comes to the same thing as if the transmission of acquired characters were an undisputed fact, for even in these other ways the acquired and activated characters respectively exert a more or less lasting influence on the descendants.

If we keep this fact in mind, it seems to me an inevitable duty for both parents to live a physically and mentally healthy life, by emphasising their good characters and overcoming their bad ones, by training and practice of their



special talents and abilities, thus influencing in the favourable sense the primary constituents—whether they are called hereditary or not—which they can transmit to their offspring. To disregard this guiding line in life would be all the more inexcusable as adherence to it can only bring advantages in their own individual lives and can in no way harm their offspring. The history of many high-bred old families, aristocratic families, families of scholars, clergymen, artists, artisans, peasant farmers, make it decidedly permissible to assume as very valuable and probable that the cultivation of good characters through a few generations at least fixes these primary constituents and makes them capable of being easily aroused to activity in the descendants. In this theory of the probability of the transmission of acquired characters, therefore, there is, in my opinion, a highly important didactic, as it were, pedagogic principle.

To a certain extent, the negative foundation for this new and, in my opinion, important way of considering the problem of transmission—just as important for the personal weal of the individual family as for that of the national whole—is formed by the long well-known fact of damage to the germ. It arises through sudden or continuous influences on the human body which, whether directly or only after a time, also influence the generative glands, and the result is an inferior and weak offspring issued from these glands. This inferiority may be expressed as general debility, which leads to the premature decay of the embryo or to death soon after birth; it may also, however, manifest itself as predisposition to certain diseases, as disturbance of function of certain organs or as diminished capability of resistance to damage from environment; finally, it may lead to the birth of deformed, under-developed or mentally imperfect offspring. I shall discuss such damage and its consequences again fully in the second chapter.

Whilst this fact of pernicious influence of the germ is generally recognised and many corroborative observations, *e.g.*, on damage by X-rays, are to hand, another possibility of germ modification is still in dispute, although modern



investigation of the blood serology offers possibilities of explanation. We now know with certainty that the body reacts in a certain way to albumen foreign to the species incorporated in it. We also know, however, that the semen introduced into the vagina is not expelled without residue but is, to some extent, absorbed into the female body. How this is done we do not know for certain, however; perhaps the sperm gets to the blood channel in an already decomposed form and is thus absorbed into the cells. Also the duration of the effect of this absorption of albumen cannot be estimated. It is a fact, however, that for instance, hormonal sterility can be attained by semen injections. We know that albuminous preparations injected subcutaneously for curative purposes develop transforming actions in the cell complexes of the body, and hence it is not a dangerous assumption that the internal genital organs of a woman also, especially the most sensitive parts, the ovaries, might succumb to the influence of albuminous substances introduced into them, therefore, also to the spermatic albuminoid substances—in which the possibility of sterilisation by injections of semen represents the extreme case. If this is so, then is it not also comprehensible that the ova contained in the ovaries may likewise be subject to certain influences of this process, and experience a certain change, due to impregnation by the spermatic substances? Further, the animal albuminoid substances, at least those of this kind, bear an individual character, as is confirmed by certain observations. Thus, *Offergeld* attended a woman who had gone through several pregnancies, some by the man to whom she was married, some by a second man; only during the pregnancies by one of the men, she had varicose veins; when she was pregnant by the other man, she had not this trouble—an observation which has many parallels, and which *Offergeld* explains as a particular reaction of the body to foreign albumen.

Of how far-reaching this influence on the ovum is, and how long an impregnating action of this kind can last, we, however, do not know much. Breeders of animals declare that thoroughbred animals, *e.g.*, horses and dogs who mate



with animals not thoroughbred are, to a certain extent, "spoilt"; indeed, characteristics of the latter may even be transmitted to a later thoroughbred offspring, because the female is said to be still under the influence of the first mate and the action of its seminal substances which produces a change in the embryo in the likeness of the first animal. However, there are no satisfactory proofs of this so-called "paternal impression," yet the line of thought quoted above demonstrates how a connection of this kind may be imagined. Similar processes in men (procreation between white and coloured people) are recorded by missionaries and students of race questions. If observations of this kind can be traced to the absorption of sperm, which I consider is not improbable, although strict proof of it is lacking, then this gives the explanation of the possibility that the external appearance and mental characters of a child do not correspond with its actual father but may be extensively influenced by an earlier partner of the mother. If this earlier partner has produced a pregnancy, then naturally this possibility is made far stronger still by the reciprocal action of child and mother, *i.e.*, in this case by reaction of the first child on the mother and the continuing influence of the maternal body resulting from this. In the next chapter we shall return to the significance of these things.

For the production of physically and mentally healthy children, a certain physical maturity and a fixed stage of development of the maternal organism, that is, a certain age for marriage, are necessary. Not only do the capability of conceiving, the power to meet fully the demands of pregnancy and the fitness for childbirth depend on the woman's age to a certain extent, but also the number and quality of the children. The age of the father is also of importance. The most favourable age for procreation for the transmission of mental abilities for the offspring is, according to *Vaerting*, the thirtieth year in the man; in the woman, not before the twenty-third year. In this, it does not alter the fact that, in exceptional cases, men of genius or outstanding ability, such as, for



example, *Goethe*, *Lessing*, *Franklin*, *Dürer*, *Marconi*, were begotten by comparatively old fathers. Early or late marriages are not, in general, suited for securing good and vigorous offspring. For psychological and social, but also for purely biological reasons, it is to be desired further that the woman should be a few years younger than the man, for she reaches physical and mental maturity relatively earlier than the man and her sexual capabilities die out sooner. If a woman marries too early then there is a danger that, owing to the still existing under-development of the uterus, the children may be expelled too soon (premature births) and come into the world deficient in vitality. Also, for its later constitution, it is not unimportant whether the child has to develop in a mature or not yet well-grown uterus, and gets its food after birth from a mammary gland not yet at its best. Statistics show also that children born before the mother is twenty-one are decidedly inferior in vitality to those of women in the next five years. Children born prematurely have a propensity for acquiring every possible illness; they are frequently afflicted with disturbances and arrests of development, and consequently with a certain biological feebleness which weakens them for the battle of life and stamps them as children of worry. Also there is, in early marriages, the danger that a too quick succession and accumulation of pregnancies and births may occur which have an unfavourable effect on the female organism, and, at the same time, is also prejudicial to the quality of the ensuing children.

Similarly, late marriage is unfavourable for the woman and her offspring. Postponing the first pregnancy to a comparatively late age frequently causes great difficulties in delivery which signify greater risk for the child.

The new-born children of old, particularly excessively old primiparæ, as *A. Mayer* emphasises, are, even in the case of robust mothers, not exactly strongly developed, and resemble the children of too-young primiparæ. Moreover, the theory that there is a deterioration of the germ in old mothers is not to be rejected lightly, and would have an influence on the quality of the offspring. We see not too



rarely that the late comers in the family, who are treated and reared as family pets, are delicate, poor children who are extraordinarily ill-fitted for the struggle for existence, and very often come to grief. Among the children of old primiparæ over thirty-five years of age, a relatively very high percentage of epileptics and psychopaths has been established, and it has been found that the intelligence of the seven to nine year old children is less the older the parents are at the birth. Likewise, the influence of the age of the mother is greater than that of the father. It is claimed to have been found that the percentage of children with a gay temperament decreases as the age of the father increases. Meanwhile, the mental aspect of children is, of course, influenced by environment. Thus, *Agnes Bluhm* is decidedly right in maintaining that the poorer mental activity of such children is due to the wrong upbringing which their already somewhat dulled and elderly parents bestow on them, whilst their mental development would be promoted by younger, more active parents. The older the father is, the more his physical and mental constitution has suffered in the struggle for existence, the worse his children must naturally be. The long bachelorhood, the danger of sexual infection and damage to the germ by the abuse of alcohol and tobacco, lowers the number as well as the quality of the offspring. *A. Mayer*, one of our best authorities in the field of gynæcology, says: "The child of elderly parents is, to a certain extent, in an approximately just as elderly position so far as vitality and generative power are concerned. With the rest of the innate and acquired characters of the parents, it has, as it were, also inherited their condition of age. While still young in days, months or years, a late offspring of this kind is already comparatively close to old age."

From these few statements alone, it follows that to achieve healthy and vigorous descendants, the observance of a certain age at marriage is unquestionably of advantage.

Just as the unphysiological postponement of marriage affects the product of the marriage unfavourably, so also the too quick succession of births makes itself felt in the



quality of the offspring. Overtasking the female organism with pregnancies and confinements represents an abuse of the reproductive power. It shatters a woman's body if there is not a sufficiently long interval between each pregnancy and confinement to give the organism time for recuperation and involution. In time, in such cases—nowadays much oftener than formerly, as with advancing civilisation, the constitution of town-bred women has deteriorated—a pronounced exhaustion occurs in which it goes without saying germination above all deteriorates. A body weakened by too many confinements in too quick succession frequently yields damaged or inferior ova which already carry in them the germ of generative deterioration. An enfeebled organism, too, does not give the embryo those substances for the structure of the body which are necessary for the achievement of offspring of high value. Premature births and abortions become frequent in such cases, and shorten the intervals between pregnancies still more; this is, of course, also detrimental to suckling and, in these circumstances, children are often born and reared who have come into the world already feeble and lacking in vitality. Hence, it is absolutely necessary in the family to regulate the tempo of the successive births and, as *Sellheim* states, in the interests of good rearing there ought to be a pause of about three years between two confinements. This time, however, might, in some cases, be somewhat shortened between the first two confinements.

At the present day when, in many countries, a considerable proportion of married women are still obliged to contribute to the maintenance of the family by their own earnings, it is necessary to point out definitely that certain occupations can exert an unfavourable influence on the growing germ.

Propagation, which means such a prodigious strain on the female organism, which makes very great demands on a woman's body and mind, cannot progress undisturbed and lead to the development of a healthy child, if the woman, by her occupation, is put into a situation which injures the natural functions of her body. The causes of such



injuries as are harmful for offspring lie in many different directions. Overlong working time, nightwork with insufficient intervals for rest, unhealthy workrooms, lack of air and light or pollution of the air with dust and chemicals, occupation with poisons which penetrate into the body, unhealthy position of the body, lack of exercise, much sitting or standing, excessive exertion which the female body is not able to bear, may do direct damage to the germ or the embryo, as well as being the cause of troubles such as anæmia, chlorosis, tuberculosis, conditions of debility, disturbances in development which again influence the germ unfavourably.

We have now outlined from what primary determinants an ideal child can grow, and what may be the causes which prevent a favourable predisposition.

If, then, we ask ourselves what practical lessons we may learn from these observations, so that we may transmit as many good germ constituents and as few unfavourable ones as possible to our offspring on their path of life, then, in the main, we find that two conclusions are forced upon us: the first runs—every individual shall foster his good tendencies and develop and strengthen them to the best of his power, endeavouring to overcome the bad tendencies and make them ineffective.

Whether the influence of the mass of tendencies which he then transmits to his offspring depend only on secondary effect, on awakening inactive hereditary factors, on actual germ improvement, or perhaps even on all these and still other factors together, may be of the greatest interest scientifically. In practice, however, it comes to the same thing; it brings direct advantage to the offspring by improvement of their predisposition. And to the sceptic who doubts the possibilities mentioned here because all this cannot be proved indisputably, it may be pointed out that his doubts nevertheless cannot alter the rightness of the principles of conduct recommended, for adherence to them brings advantage in any case to the people employing them and to their circle and thus, indirectly, to the descendants.



The second conclusion is : that in the choice of a mate, of the being with whom one intends to unite in marriage and found and build up a family, one should not be intent only on the fulfilment of one's own desires, one's own efforts, one's own inclinations, but should consider first of all the interests of the offspring resulting from this union. The woman should ask herself : " Can I give my children this man for a father and does the family to which he belongs (and to which they will belong) give me security for their predisposition ? " And the man should ask himself : " Do I want this woman to be the mother of my children and is the inheritance which she will transmit to them worth striving for ? " If they act according to this principle and it happens that, arriving at a negative answer to that question, they have to renounce painfully the fulfilment of their desires, they may reflect that the interests of their offspring are not only more important than their own, but that, in the end, they coincide with them.

Now, how can we get a clear understanding about answering this question ? Numerous proposals have been made in this field. Most of them lead in the end to the establishment of marriage advisory bureaux which propose to test fitness for marriage and make the permission or recommendation for marriage dependent on the so-called certificate of health issued regarding those diseases which, at the beginning of this chapter I cited as hereditarily unfavourable, diseases which are to be sought for in marriage candidates by skilful questioning and searching medical examination, with the most careful consideration for the hereditary conditions.

Another proposal is to set out in the case of every candidate for marriage a genealogical table which gives information about the hereditary tendencies to disease in the candidate himself, as well as about those of his brothers and sisters. On the basis of the data received, a marriage certificate containing the most important results of this family history is to be issued.

It is also recommended that family health records be kept which, passed on from generation to generation, are



to make it possible for the descendants to examine the state of health of their line of ancestors. This idea seems to me particularly worthy of attention. Family chronicles are exceedingly interesting. Health, however, has hitherto been given almost no consideration in them. The record of the phenotype and of the racial features of the members of the family, brief observations about health, particularly illnesses, cause of death, could give valuable data for the members of the family itself as well as for candidates for marriage.

Efforts have been made in various directions to have the certificate of health given by the State and to allow a marriage only when the official marriage certificate prescribed by law permits this.

As regards hygienic marriage laws, we find even in the Bible the prohibition of the marriage of relatives, and 150 years ago *Peter Frank* demanded prohibition of marriage between people from whom "little good for a healthy population is to be expected," *i.e.*, who are afflicted with mental diseases, venereal disease, hypochondria, tabes, pulmonary phthisis, epilepsy, etc. In our day, legal sterilisation of biological detriments and individuals doing serious harm to the national physique by their propagation respectively has been introduced in numerous countries, sometimes in the form of voluntary sterilisation permitted by the State, sometimes in that of a compulsory removal by operation of the power of propagation. To go further into these laws here would take us too far. Moreover, they can, by their nature, find application only in extreme cases, whilst we have in mind here more the "ordinary individual."

Besides the fact that the idea of a State health certificate, in spite of its age, has yet only for special cases been acted on, proves that there are many difficulties attached to it, which I have already referred to in my book: "Fit or Unfit for Marriage." In the first place, these measures can bring about only a negative selection but hardly a positive furtherance of the valuable conveyors of heredity. Secondly, very many diseases and tendencies which we would like to eliminate can be ascertained only if the person investigated



voluntarily gives all the bases for them. Since, however, we have to reckon very seriously with the desire for concealment, even the most experienced doctor cannot attain his object, or at least can only get half-way with a very great expenditure of time and inquisitorial expedients. In addition, he would further have to ransack the whole family history, and this would certainly destroy for many, and especially the best, all desire to marry and give rise to all sorts of slander. Then the examining doctor without any strict lines of direction would have to make more or less arbitrarily a decision which will direct the fate of two individuals and the whole of their descendants. This responsibility no doctor who knows the limitations of his knowledge will take upon himself, all the more so as he would afterwards be exposed to reproaches as to whether he had been right in forbidding or permitting marriage to a candidate. Then, too, individual examiners would hardly decide alike; one would perhaps declare a candidate who has a glass of wine daily to be a habitual drinker and unfit for marriage, whilst another would call an individual fit for marriage who has slight epileptic fits, though only very rarely. And, finally, there are, as *Leppmann* says very rightly, still other points of view which are just as important as the eugenic: the right of the individual to his own personal happiness in life.

Advice in marriage should be just advice but not compulsion. Advice is certainly no use to those who will not follow it; therefore everything must be done to make people understand clearly that their own interests are in reality identical with those of their descendants, and that consequently not only for eugenic, but still more for personal reasons, they do well in making plans for marriage to take into serious consideration their own state of health, including their hereditary predisposition and those factors in their prospective marriage companions.

We want by every means, official and private, by word of mouth and by writing, to make people understand, and to try to convince them more and more of the fact, that care for the quality of their offspring is not only a moral duty



to the children and the community, but also that it is a wise consideration of their own interests.

Advice on these questions which, to be proper, must be based on intuition and reason and given either by a suitably trained family doctor, or in consultation with him, has to take into consideration not only the physical and mental state of health of the candidates for marriage and their forefathers in hygienic and hereditary respects but also in all reasonableness the most important irrational factor, "love" in degree and quality. The principle of reasonable choice of a mate, which must, within certain limits, undoubtedly be regarded as right, may—as *Gemünd* emphasised again recently—be compared with the opinion of *Ed. v. Hartmann*, that "the human being instinctively seeks out the individual of the other sex who, fused with him, represents as perfectly as possible the generic idea." Age-old experience, says *His*, teaches that within a not too circumscribed range the individual love choice is almost always able to find a suitable partner. As an example of this, he refers, among others, to the valuable peasant stocks which, fused with their surroundings, form, so to speak, a part of nature.

It is a strong argument against the *merely* reasonable choice of a mate that, if love does not arise subsequently and gain the upper hand, the opposition between the sexes soon asserts itself as a disturber and turns conjugal aversion not infrequently into hate. This not only makes the husband and wife unhappy, often also neurotic, but has a very unfavourable effect on the still unborn and the already existing children growing up in this atmosphere. That is to say, it is by no means a matter of indifference in what mental atmosphere the child is conceived, born and brought up, just as it is not unimportant in what mental and physical condition the parents are when they beget the child, and in what mental and physical state the mother is when she is carrying or gives birth to it.

Heredity, says *Günther* *Just* rightly, does not determine what an individual is to become but what he can become. Likewise those who reject the possibility of the transmission



of acquired characters will have to admit most decidedly that a healthy person has greater prospects of healthy, efficient offspring than a sick and enfeebled one with the same hereditary characters. Breeders of animals and cultivators of plants always take the best specimens for breeding purposes, because they know from experience that the desirable individuality is most likely to be propagated by healthy parents. In particular, the material milieu whilst the child is in the womb can strengthen or weaken, modify and kill the development brought about by the valuable inherited characters and thereby influence the peculiarity and efficiency of the individual in a favourable or unfavourable direction. When modern psychology assumes that the earliest mental impressions are decisive for the later development, one cannot dismiss lightly as a chimera that a physical influence in the period before birth should be possible and that this influence might also take effect in improving the inherited factors. On the other hand, some writers, whilst recognising the established facts of the doctrine of heredity, incline to the view that the heritability of a disease in the family is to a great extent brought about by the "transmission" of defects in rearing, such as insufficient nutrition—whereby, as in the marriage of relatives, owing to uniformity of the inheritance, detrimental factors, or genes, are added together, producing a tendency to disease or actual disease. Many go still further, speak of racial therapeutics, and are convinced of the improving action on heritable factors of a careful upbringing. The estimation of the constitution as predetermined by fate, as something inalterable, is now at any rate no longer shared by an ever-increasing proportion of scientists, and experts speak actually of a constitutional therapy which aims at altering the diseased constitution and improving it at least functionally. The "functional" outlook in pathology has aroused a therapeutic optimism which for a long time had almost disappeared in the earlier medicine which took into consideration only the inevitable changes and swore by pathological anatomy. If the constitution is conceived as the expression of vegetative equilibrium, then it is certainly



a hereditary factor, but it is capable of being influenced in its functional forms of expression. Whether this influence does or does not pass to the germ-plasm is then of no importance, because it is in the first place a question of the germ carriers as such being improved.

In spite of this, however, it cannot be denied that measures for improving the constitution brought into use through many generations would, in the end, act in the direction of improving the hereditary factors. But all the same, though one emphasises the necessity for a suitable choice of primary constituents from which descendants are to arise, one need certainly not yield to the fatalistic conception that thereby the fate of the children arising from these primary constituents is sealed once and for all. For the proper *fostering* of the primary constituents to be transmitted—and transmitted to the child long before procreation—at procreation, during the prenatal life and after birth by training and later again by self-training, can both in physical and psychical respects bring out the best of these primary constituents, and make them dominant.

I would like to add still another optimistic note to what has been said. It will best be characterised by the title which *Benn* has given his radio lecture on this subject: "Talents can be cultivated." In his lecture he suggests impressively that from certain surroundings and circles by gradual cultivation, *i.e.*, fostering, transmission and intensification of certain primary constituents and experiences, the strongest capabilities, indeed definite high talents, arise, and that, consequently, mentally developed character is transmitted and continues in its effect. *Benn* considers the hereditary milieu of many parsonages to which, at the end of the eighteenth century and the beginning of the nineteenth, the names of *Burckhardt*, *Nietzsche*, *van Gogh*, *Hermann Bang*, *Björnson*, *Selma Lagerlöf*, belong, and then continues as follows: "In addition to this hereditary milieu of the parsonage, Germany has a few others besides from which it can likewise be seen how a particular hereditary stock, moulded by the work, inclination, and inner



experience of several generations, has produced the great German talents. One can speak of families of talent which, tempered by continuous and family cultivation, produced great offshoots. There are, for instance, two groups of craftsmen playing an authentic, important part in the birth of the great painters. The great musicians and particularly the famous German musicians, to a great extent, come from hereditary lines in whose ancestry first church organists and village schoolmasters, then the simple professional musicians, orchestral players, conductors, and lastly, also talented dilettanti play an influential part. To this group belongs *Beethoven, Bruckner, Brahms, Mozart, Offenbach, Reger, Schubert, Vivaldi, d'Albert.*"

In the case of the painters, there is a hereditary milieu in which artists to some extent unknown, but also actual craftsmen, are assembled: *Dürer, Cranach, Holbein, Menzel* belong to this; in the case of *Hans Thoma*, it is the clock painters of the Black Forest who are to be found in his ancestry.

We must here conclude our considerations of the subject, important as it is interesting, which has occupied us in this chapter.

A quotation seems to me particularly appropriate for this. I borrow it from the author whom I have just cited, *Gottfried Benn*: "The tremendous ancestor worship of earlier religions is being revived again in the teaching of modern eugenics when it shows that the gene, the idioplasm, is there: productive and fundamental, natural and doubtless inevitable, but also well concealed by laws of a much more far-reaching and remote kind than our experience could digest and fathom, but, nevertheless, the spirit as another and higher principle is there also, and it and its experiences make a deep impression on the idioplasm, make an impression on the next succession of the species, make an impression in cultivation or weakness, with pictures of elevation or caricatures of depreciation, make an impression vague or substantial on the many and on the individual, the visionary and the actual."



## CHAPTER II

### CARE OF HEALTHY PROCREATION

#### *Conceptional Hygiene. How does the Mother conceive an Ideal Child?*

THE relations with the next generation which we must bear in mind in this chapter are governed chiefly by the personal attitude of human beings to their own offspring. Every one has aspirations for his children even before they are born or begotten. We would like to endow them with every advantage, provide them with the highest qualities of body and mind. But always when the mind turns to the future, it loses that certainty and exactitude which may otherwise characterise it. Hence, in the wish to transmit as many valuable qualities as possible, many come to follow advice which is quite irrational, the usefulness of which is dubious, the foundations of which are absurd. On the other hand, many people imagine that the act of procreation undertaken in a physical and mental intoxication will create products sometimes infinitely valuable, sometimes entirely worthless independent of any effort on their part. They are afraid that any interference with the laws of nature, still to some extent unexplored, might achieve the opposite effect, inferior offspring. Consequently, fears and desires struggle in the minds of the would-be parents, and their thoughts turn to offspring moved by such feelings as raged through the unfortunate youth in *Schiller's* fine poem before the picture of *Sais*.

Should the doctor in this case, where it is a question of the most secret longings of human beings, raise a warning voice, presume upon his experience; should he venture to make rules and give advice for this zenith of life? Must he not fear the reproach that he is trying to impose his own laws, his own views on the mysterious forces of nature? In



my opinion, he not only should, he must. For since he is in fact able, from his own observation, to deduce certain laws the utilisation of which is in the interests of both parties, the parents as well as the children, he must in fact regard it as appertaining to his duty to pass on his knowledge in this respect also.

It goes without saying that our hygienic measures would be few and not inclined to be hard and fast when both prospective parents are healthy, come from "long lived" families, and no marked signs of disease are perceptible in their ancestors. It must not be forgotten, however, that ordinary everyday observation teaches us that even in quite healthy families, now and again members are produced who suffer from diseases connected with heredity. Indeed, there have not been wanting investigators who have postulated a constant deterioration of the idioplasm, and have even worked out the period after which all men must have physical and mental defects. The absurdity of such apprehensions may be refuted by a comparison from nature.

We know that rivers carry with them the refuse of the big towns through which they flow. A short distance below the occupied space, the water is actually permeated with dirt and has innumerable bacteria in it. But a few miles farther down stream, the physical condition and the amount of bacteria are almost exactly as if the water had never had mingled with it the contents of the sewers. The process of automatic purification which takes place without the aid of man has caused the disappearance of all the foreign admixtures. The process is similar in the "pollution" of the idioplasm. If the "hereditary taint"—that eternal dread of many anxious people—in the idioplasm were to take effect as is feared, then not only would our children be endangered but generations of our forefathers must already have shown all the dreaded symptoms of degeneration.

The idioplasm is preserved from deterioration by natural powers; the law of the preservation of the species discovered by *Darwin* represents such an activity. If external changes force succeeding generations to assume a characteristic or



a change of function which is foreign to the species, *i.e.*, is capable of being removed, then this strangeness is lost as soon as the external pressure is removed. Nature endeavours to eliminate again as quickly as possible everything forced on it. In the individual, too, exists a power similar to this conservation of energy. We may compare it with the natural power of healing which makes injuries and remains of a recent illness disappear wholly or partly. We may with *Darwin* regard it as nature's inherent endeavour to preserve the species unchanged. In other words, acquirements effected by changed conditions of living, by cultural influences, by climate and environment tend to disappear again as quickly as possible. Similarly, this balancing power can modify the effect of influences which may have produced damage to the germ. Let prospective parents who have had fears of this kind for their offspring keep this in mind.

After these introductory observations, advice may now be given which applies to all, even to the most healthy.

Ordinary daily life, with its exhausting details, whether it is spent in happy occupation or in worry about necessities, affects the health, the well-being, the mental elasticity of the individual. When we think of begetting our offspring, we should keep in mind that we are coming in contact with an ancient dream of humanity ; we are, by doing so, creating a bit of eternity, of immortality ; by procreation, we want to transmit our ego and to make it go on living in our children and our children's children. And therefore, because we want to and must give our best, we should set a certain time for concentration on the duty in which we prepare body and mind. As the artist carries within him for a long time the inspiration of a moment, lets the idea, the *leitmotiv* mature in him but does not yet know whether a poem, a tale, an epic or a play is to arise from it ; as he does not yet know whether a short melody will embellish a song, a sonata or a symphony, since he is creating by means of the creative powers of his mind, around this momentary inspiration, an unique work, a work of art, so must parents endea-



your now together, now alone, to remove the dust and dross of daily life from mind and body. A few days' holiday spent in new and unaccustomed surroundings far from professional worries should prepare the future parents for their task.

If what has been said advances a demand for *intentional* procreation, the objection may be made that in place of a procreation undertaken in a transport of love, in complete self-forgetfulness, we are putting one worked out prosaically, *i.e.*, that we are interrupting the artist while creating, we are analysing and dissecting the physical and mental act of his creation and prescribing laws for him when apparently his genius urges him to a great creative effort. To this we reply that experience shows that the artist—even the greatest—with his ability alone accomplishes almost nothing unless he has deepened and perfected it by practice and construction. Just as the creative individual may have an occasional success, and yet in the end never attain the peak of artistic creation without this stipulation, so can a couple certainly be blessed with the production of a well-bred child, but none the less they run the risk that chance which, to be sure, produces a fine thing now and again, can also have a disadvantageous side. Hence the scientist must be listened to when he teaches us to recognise the laws to be observed, and how to eliminate, avoid, or mitigate disadvantages.

That science, especially in its application to practical life, often has by no means an easy task is shown here, however, in a very striking and even somewhat painful manner. For to the first question which represents itself automatically, namely, that regarding the time which would be most favourable for procreation, it can give no answer which could be generally recognised by investigators as accurate.

By time, in this connection, we mean the days within the monthly cycle of women's sexual life which would be most suitable for a planned procreation. As we know, an ovum is set free from one of the two ovaries in the interval between two menstruations. Even this knowledge is not certain; there are investigators who assume another time for ovula-



tion. It is obvious that the days which coincide with ovulation or immediately follow it are to be regarded as those most favourable for conception. *Knaus* and others are even of opinion that an impregnation is possible only about this time and that a conception outside that comparatively short period must be regarded as precluded. On the other hand, I, along with many other gynæcologists, am of opinion on grounds of experience that, generally speaking, sexual intercourse in human beings may lead to conception at any time, because I, in opposition to *Knaus*, assume that both the ovum and the spermatozoa which have penetrated into the inner female sexual organs have a comparatively long duration of life, and I, moreover, am convinced that ovulation, in consequence of various circumstances especially allied with an orgasm, can be hastened or delayed as a result of other influences. However, I too regard the interval and, to be precise, the tenth to fourteenth day after the beginning of the preceding menstruation as, on the whole, the most suitable time for procreation. For more precise information concerning this question, I refer my readers to the fifth chapter.

It is of great importance that prospective parents should endeavour to get the best physical condition for procreation. We know that processes of disease of any kind are undoubtedly detrimental to the ova and sperm cells, and therefore, in the interests of the offspring, we must say a word for those hygienic measures which we describe simply as normal and healthy conduct of life. Regular and sufficient sleep are recommended, preferably in the hours before midnight, because it is then deeper and more refreshing and fulfils its purpose, the restoration and recovery of the brain cells, far better than in the hours after midnight. Townspeople, especially brainworkers, should also be recommended to take a holiday in the country as a preparation for procreation. During this period, the damage resulting from their professional life can be compensated. A simple diet in which natural animal and vegetable products should be preferred, supplies the body with a great many substances of vital importance, especially vitamins, and very valuable



organic compounds which are neither spoilt by the process of preparation nor changed by storing. A satisfactory excretion of the waste products of metabolism goes hand in hand with this.

The nearness to nature frees the mind from the everlasting details of ordinary life ; the weariness which days in the sun can bring, even if we have spent them in idleness, is essentially different from that which ordinary life leaves behind it. In the former case, the happy expectation of the rest of the holidays ; in the latter, the anxiety lest the success of the day's work behind us be lessened and detracted from by some reaction ; in the former, the pleasure aroused by using one's limbs in the open country ; in the latter, the fear lest a mistake, an omission, an excess of effort might have a disadvantageous effect. The change of scene which generally brings with it also a change from the usual climatic environment, as well as a different distribution of time, revives mind and body. The joy in creating which is inherent in every true man is aroused and enriched with new impulses. The nearness to the earth and the new environment will make the woman forget her everyday worries, and the monotony of her everyday life ; and she will be brought closer to her essential task and see her inherent desire for the child strengthened.

It must seem to many readers that the honeymoon period is best suited for these demands and yet experience of weight is opposed to procreation in this period. We shall go into the hygiene of the honeymoon here only in so far as to repeat briefly my former advice. Figures have been given showing how often sexual intercourse at this time can take place without detriment to the health of the couple. Wrongly, for a statement in figures can never do justice to the individual, since the sexual capacity of different beings varies greatly. In general, during this very period, moderation may be recommended for certain reasons.

Procreation had better not be aimed for at this time. The following observations may explain this advice.

Sexual abstinence in engaged couples gives rise to mental strain which is undoubtedly harmful to the nervous system :



irritation, disturbed sleep, tendency to over-excitement and to emotional outburst, inability for mental concentration, diminution of the functional capacity, relaxation in attentiveness or capacity of recollection are well known conditions which mark the period of betrothal, and which quickly disappear after the adoption of regular conjugal sexual intercourse. It may be mentioned in passing that the impotence of many men on the wedding night has often aroused fears which later have proved to be exaggerated; now and again, however, a mental inhibition here too has made sexual union impossible for some time, and led the impotent man to a specialist who can often remove quickly a neurosis of this kind.

If the wife is a virgin or even ignorant when she marries, the sexual union may at first fill her with fear, aversion or even loathing. For this reason, there may be non-appearance of the sense of satisfaction, and it is usual now and again for nervous symptoms to start in young married women which might even at this early stage be prejudicial to the growth of a psychical harmony.

Sexual excitement not brought to an end, which in continent betrothed couples has led to the nervous troubles just mentioned, may however, owing to these very troubles, also affect the quality of the ova and spermatozoa disadvantageously.

Further, the idea of a possible inferiority of the products of pregnancy arising in the first period of marriage is explained by the observation that such pregnancies comparatively often end prematurely, that is, with a miscarriage.

Finally, as an important argument against an intentional procreation at the beginning of marriage must be mentioned the fact that in the last decade the number of divorces in almost every country has been increasing, a proof that far-reaching estrangement existed between the married couples and could not be bridged. Without going into the reason for this phenomenon which, to be sure, cannot be recognised as generally admissible, this fact may be taken into account here since, in such circumstances, the



too early procreation of a child must be regarded unfavourably. Matrimonial discords harm particularly the mental but also the physical development of a child, in contrast with which it is established that children of happy marriages, as a rule, grow up into sterling members of the human community. For this reason, prospective parents conscious of their responsibilities are recommended to have a trial period in which they should be convinced of their mutual conjugal affection and their unalterable will to continue a harmonious partnership to the end of their lives before they crown this by the intentional procreation of children.

Married couples who have already had sexual intercourse before marriage are advised for the same reasons to have a period of waiting in which they should prepare for conception. For they, too, have no guarantee of the permanence of their mutual liking, and they, too, have first to get accustomed to the new world of matrimonial partnership. This advice is recommended by the experience of psychologists; in spite of all assurances of personal freedom, of the right to dispose of one's own body, the subconscious mind estimates pre-marital yielding differently to that in marriage. Even with a superficial examination, the psychologist can learn how these "antiquated" views of the "sinfulness" of pre-marital sexual intercourse have the effect that these often subconsciously fixed moral and ethical inhibitions resulted in being detrimental to sexual enjoyment; and this may later in marriage represent considerable affliction. Further, the female side of the pre-marital sexual relations gets the worst of it; on her, along with the responsibility, falls the whole burden of the "consequences"; illegitimate motherhood stands as a spirit of dread behind every embrace. And this fear sometimes also has a disturbing effect on the marriage which has developed from these relations, particularly in the sexual feeling of the female partner. How important just this untroubled sexual feeling in the woman is in pregnancy and birth we shall see later.

Various considerations make the demand for a certain sexual abstinence before copulation seem well founded.



Breeders of animals have been able to observe that sires on which too great sexual demands have been made beget inferior offspring. The intensification of the sexual libido as a result of continence is a factor of great importance. It was known even to the old physicians that childless couples could achieve pregnancy after being separated for some time. This may be traced not only to the improvement of the ova and spermatozoa but also to the increase in sexual power of attraction in consequence of a long leave of absence from marriage. Further, however, many factors speak in favour of the fact that the sexual organs of both partners accomplish a pleasurable copulation more actively, *i.e.*, with increased activity of the contributory muscles.

The importance for the children of a harmonious sexual life in the parents has long been overlooked. Fully satisfied parents not only beget more healthy children, they themselves also remain exempt from mental and physical troubles which are accustomed almost always to follow unsatisfied sexual intercourse after a time. Popular tradition has known of these connections from time immemorial; "love children" are well known and to them are assigned great advantages; they are said to be prettier, cleverer, more capable of resistance and to thrive better than other children. *Shakespeare*, the keen observer of human nature, wrote:

Why brand they us  
With base? with baseness? bastardy? base, base?  
Who in the lusty stealth of nature take  
More composition and fierce quality  
Than doth within a dull, stale, tired bed,  
Go to the creating a whole tribe of fops,  
Got 'tween asleep and wake.

Although scientific confirmation, which has to be supported by a great mass of material, has not yet come to hand, yet many doctors can confirm the justice of this popular belief by their observation of individual cases. Yet the opposite is more plainly to be observed; women who have been made pregnant in pleasureless embrace, whose pregnancy has been overshadowed by trouble and hardship, as well as those who, owing to some experience or other, have been



hostile to the embryo in their womb. Such women give birth remarkably often to nervous, delicate children, rearing whom presents the greatest difficulties.

Whilst I have so far had healthy parents in mind, that is couples who suffer from no symptoms of any particular diseases, and I have had merely to advise them to remedy the harmful effects of everyday life, of their profession, of the nerve-racking city, I must now take into consideration those who are diseased in some respect.

Little as most of the so-called intercurrent diseases—by these is meant those of a transitory and feverish nature—at least unless they assume too serious a character, affect an existing pregnancy or endanger the embryo, yet one must be cautious with procreation where such illnesses exist, or in convalescence after them. Every feverish illness can affect the quality of the ova and spermatozoa since, in this case, not only an organ but the whole body is affected. Some infectious diseases are attended with inflammatory changes in the ovaries or testicles; most commonly, they set in after mumps, typhus and some epidemics of influenza; it may be assumed as certain that affection of the nutrient medium has as a result a change in the germatoblasts. In women, great disturbances become apparent in irregularities in menstruation, a common accompanying symptom of feverish or debilitating illnesses. Naturally, it is not possible to enumerate with universal certainty the diseases in which the symptoms of this kind appear or are absent, and so the doctor in charge must decide in each individual case whether in these circumstances procreation may be permitted or should be put off to a later date. To ease anxious minds, it may be added at once that, the most acute illnesses end in complete recovery, and consequently recovery from such an illness leaves damage in the ova and spermatozoa only in exceptional cases.

A disadvantageous influence must be ascribed to long continued worry or nervous irritation, and in the interests of the offspring I must advise against procreation in these circumstances. Experimental investigations have shown that anxiety and trouble, in short, any mental depression



(discord), influence greatly or even paralyse the secretory activity of the gastric glands. This law found in the case of the gastric glands holds good also for the other glands of the digestive tract. Indeed, it may be taken as certain to-day that even still more the ductless glands, where the hormones are produced, are subject to the same dependence on moods, that is, on mental states, and respond to mental strain with change in the character of their products. Therefore, the practical application to conception follows: where mental crises exist, one must avoid procreation and do one's utmost beforehand to get entirely rid of temporary or chronic changes due to emotional disturbances. Often these tensions are not so much to be regarded as the effect of external, *e.g.*, economic conditions; they are rather the counter-effect of spiritual, "suppressed" aspirations; and if discussion between husband and wife or with other persons concerned does not help, they can often be got rid of by psychotherapeutic procedure.

Chronic organic diseases are often not prejudicial to the quality of the children, because the body in just these circumstances will bring its tremendous capability of resistance into operation. The disease itself has mostly been confined to the organ affected, and the body, in consequence of its protective powers, is able to a great extent to remove poison by itself. In these circumstances, however, it will always be advisable to consult a doctor and to obey his instructions scrupulously. In the first place, he will have to decide whether the afflicted mother can meet the demands made by the birth without making her disease worse, whether she can keep her child afterwards or will have to give it into the care of strangers, whether the disease is transmissible to the child, and what prospects there are in general for mother and child.

Since quite erroneous ideas about the nature of diseases are widespread among most laymen, it must be shown by examples how they actually take effect in this respect, how these effects can be combated and how, in this way, the injury to the offspring can be avoided. In this, we can in general differentiate between injuries which cause curable



changes, *i.e.*, leave no trace behind, and those in which chronic diseased conditions remain behind. As an example of the latter may be cited the action of X-rays on the ovary when, for some reason, we have to bring about the temporary elimination of menstruation.

The technique of the dosage and measurement of rays has progressed so far that only a sufficient quantity of radiation to bring about the absence of menstruation for a definite period is directed at the ovary. Since this radiation attacks chiefly the growing cells, a definite quantity is able to check the further growth of those follicles which have reached a certain degree of maturity. The destroyed follicles do not grow any more and, consequently, menstruation remains absent for a definite period. It is, however, impossible to direct the rays only towards those follicles which are at a certain stage of development, that is to say, those which would cause the appearance of menstruation in the next months. Rather it cannot be avoided that other still immature follicles are affected—and injured. This action, however, will not damage these still undeveloped follicles intended for a later growth to the same extent as the more mature ones which are eliminated by the rays. Nevertheless, in these immature ova injurious changes are left behind, and this is supported by the observation that women who have menstruated again after X-ray castration and been impregnated have either aborted spontaneously or brought more or less damaged children into the world.

The effect of X-rays is comparable with the effect of many poisons or other injurious things. Conditions of this kind are, however, on the whole difficult to distinguish because the quantity tolerated varies with different people; a quantity which certainly does not harm one person may, with other individuals, lead to serious changes. This may be illustrated by the effect of alcohol, which varies not only with different individuals but also with the same individual in different circumstances.

At this stage the discussion of intoxication may show the nature of those changes which we can regard as curable.



By a state of intoxication, we understand a poisoning which begins in a comparatively short time after the consumption or inhalation of certain substances, and after an initial stimulation leads by way of weariness to conditions of depression and to insensibility. This effect of varying quantities shows us that, above all, the brain is affected, and we know that after the consumption of not too great a quantity of alcohol, elimination through various organs proceeds, and in this way a complete recovery is soon possible. Now the effect of the alcohol is by no means confined to the brain alone. Rather, many circumstances go to show that other organs also are affected sympathetically; I mention only disorders of the stomach and displacement of the kidneys. There is no doubt, however, that the sexual organs too are poisoned by intoxication, and with the great sensitiveness of the germ cells damage to them is also to be expected. If, however, the alcohol is destroyed and eliminated by the natural powers, then the spermatoblasts recover just as the other intoxicated organs do; in short, the organism is entirely freed from poison. Certainly, no harmful effect on the body is to be ascribed to very small quantities of alcohol, their stimulating effect on metabolism is generally known, and also often used with success in medicine. If the results of experiments on animals are brought forward as proof of the contrary, one can object that in this particular instance their trustworthiness is justly to be doubted.

The poisoning of the whole body by which also the spermatoblasts are affected, compels us, however, to object to procreation during intoxication as extremely serious and dangerous to the offspring. A schoolmaster who had worked for a long time in a well-known wine-growing district told me that the children begotten after good wine years are dull of apprehension, violent, unmanageable, even vicious. It occurred to him that in particular the owners of big vineyards begot inferior offspring in such years, and he is certain that this portion of the population begotten in intoxication is to blame for the economic decline of many vineyards. However, he found a remedy less original than



effective by explaining the connections to the wives and found them ready to assist him in his eugenic efforts.

The defects which children of chronic excessive drinkers of alcohol bring into the world with them need hardly be enumerated. Only in a few cases are such children physically well developed; in most cases they are born seriously harmed, scarcely capable of life, their up-bringing always causes a great deal of trouble, their mental qualities develop slowly, they are predestined to populate prisons and lunatic asylums.

This fact leads to the conclusion that prospective parents who in intentional procreation wish to give life to a child with the best possible predispositions must be advised not to drink alcohol for a fairly long time—at least four weeks. This period is not chosen arbitrarily; it is based, at least for the woman, on the consideration that a—though temporarily—poisoned follicle and vitellus developed from it might damage and endanger embryo and pregnancy.

Some consideration must also be devoted to drug addicts. Procreation must in the interests of their offspring be forbidden to all those who take alkaloids (morphia, cocaine, opium, hashish, heroin, etc.) until they are cured of their serious malady. But, in just such cases, nature itself helps marvellously; for men and women who are afflicted with this taint are generally impotent and incapable of conception respectively. Women in the case of abuse of drugs mostly show menstrual disturbances after a very short time. According to *Leppmann*, most pregnancies end prematurely, but women morphia-addicts, occasionally, have brought mature and apparently healthy children into the world. These, however, showed a craving for morphia very soon after birth.

Akin to drug addicts are to a certain extent those "sufferers" who at every opportunity, whether for physical pain, or psychological discomfort, resort to sedatives in medicines for alleviating pain. Although most of these specifics, to be sure, are harmless, and scarcely cause damage to the germ, yet in the interests of the great task, this abuse might be



discontinued at least for the period claimed above for preparation for the act of procreation.

The spread of smoking obliges us to deal also with the harm which the use of tobacco in reality and in the imagination of the smoker (but more in that of the non-smoker) is said to bring in its train, as it is connected with our subject. In this, various points have to be taken into consideration. In the first place, it is to be borne in mind that tobacco used in excess can be more or less detrimental to the sexual impulse. Then that the female generative gland is much more susceptible to nicotine than the male. And to passionate defenders of women smokers who think this "little bit of cigarette smoke" can exert no influence of any consequence on their bodies, may be mentioned, as striking proof of the contrary, the case of a woman doctor smoker whose baby declined more and more and finally refused the natural food till the mother rid herself of the effect of the poison in her body, which passed from there through the milk to the child, by giving up smoking—by no means an isolated observation. On the other hand, it must also not be forgotten that with many smokers, being deprived of tobacco leads to states of depression of a physical and particularly of a psychical nature, and consequently a depression of this kind might also have an unfavourable effect on the product of a procreation. If these considerations are to be taken into account, it is best done by keeping the husband, if he is an excessively heavy smoker, to moderation during the "preparatory period," but dissuading the wife from smoking at all during this period—which, with her, must last at least four weeks in regard to this—and during pregnancy and nursing.

The phenomena which we have mentioned in the last few pages must in general be regarded on the one hand as the result of civilisation; on the other hand, however, they are to be estimated as the expression of a fundamental nervous character in certain persons. The chronic pyramidon eater, the heavy smoker, the woman who takes too many sedatives, in many cases also the man who drinks to excess; all are for the most part individuals whose "nervousness" is



shown most markedly by these peculiarities. In other cases again, however, it is a symptom of quite a different kind by which the "nervousness" manifests itself. But almost always sufferers from it have reason to entertain fears for the fate of their offspring. For "nervous" parents are very often worried about the transmission of their malady to their children.

As to the origin of nervous diseases, no agreement prevails even in scientific circles. Some regard neuroses as an expression of damage to the germ, as hereditary or conditioned by the inherited characters, others regard it exclusively as the result of experiences in childhood—so-called psychical traumata, a condition of the body produced by a wound or external violence, from the Greek *trauma* (wound), by which is meant experiences accompanied by strong sensory perceptions. Accordingly, they regard nervousness exclusively from the psychical standpoint, and they see in the symptom, according to the attitude of their training school, the effect of complexes of various kinds (inferiority, power, sexuality, etc.). Many medical considerations favour the first mentioned view ; in many nerve diseases inadequacy is observed with a certain regularity in certain organic function ; organs or systems of organs frequently show an insufficiency in function ; the functional capacity of the body is generally lowered. The supposition mainly supporting transmission, however, is based on the circumstance that certain forms of disease are repeated in members of the same family, that is to say, that the symptoms of disease within the circle of blood relationship show a similarity not to be overlooked. Opposed to this, the significance of the psychical causation follows from the circumstance that psychical treatment of the sufferers—psycho-therapy—is able to remove all or, in any case, the worst symptoms and to make disappear, along with the psychical troubles, also numerous physical symptoms. Even at the present day, we are still unable to decide with certainty the question of the origin of nerve diseases ; we can, however, without doing violence to medical experience very well assume as probable that the truth might lie half-way between, that is, both causations—the physical and the



psychical—exist side by side. Hence, if we endeavour to avoid maladies of this kind in the offspring, we have perhaps to give the somewhat mystical advice to produce the greatest feeling of change of living, *i.e.*, to strive for the changes recommended earlier in mode of life, if need be in *milieu*, in luxuries, in order to undertake procreation in a state of psychical and physical elevation; for there is much to be said in favour of the idea that this intangible condition which we perceive as well-being, high spirits, good humour, in spite of its variability, influences not only temperament and character but also the physical qualities of the children. This seems to me to be the most important prenatal neurosis—prophylaxis. The part of the neurose supposed by psycho-therapy to be essential—*i.e.*, that acquired in childhood—does not, it is true, yet come into consideration at this point.

Neurosis has to be drawn within our circle of consideration from another side. I have made mention above of the importance of the woman's orgasm for the high value of the offspring, and wish to bring forward here those factors, in so far as they are caused by neurosis, which prevent the orgasm's taking place. The absence of the sense of pleasure in copulation, if no other definite causes (*e.g.*, organic disease of the genitals, inexperience or antipathy to the partner) are present, must be regarded as a rule as the effect of a neurosis when conscious, but, for the most part, unconscious ideas prevent the sensation of *dénouement* being experienced. In recent years, gynæcologists—to some extent under the influence of psychotherapeutic investigations—have given greater attention to these connections, and they have recognised the removal of sexual frigidity as a hygienic necessity, important not only in the interests of the husband and wife but also in those of the offspring. Sexually satisfied married couples are more closely bound to one another; the up-bringing of the children proceeds more easily. Unsatisfied parents visit their disappointment upon their children; their attitude to them is emotional; they treat them with exaggerated love or excessive antipathy, and spoil their children either by an excess of solicitude or by undue hardness,



strictness or even animosity. It seems to me opportune to put in a few words here about the hostility between husband and wife, although I have devoted the second book of my Trilogy to this subject. Antipathy is differentiated from sexual frigidity and from its equivalent in man, impotence, chiefly in that the former (antipathy) is essentially felt consciously, whilst the latter—sexual frigidity—arises from unconscious sources. However, this does not exhaust these very complicated conditions by a long way, but the shortness of space prevents my going into the subject more fully. Only it must further be borne in mind that hostility in the wife can often be traced as reaction to unkindness, egoism and want of interest in the husband, although the doctor, in judging the conditions, will refrain from any decision on the question of blame. Certainly, hostility often comes all of a sudden, and then the doctor or clergyman called in will almost always succeed easily in finding a more or less plausible cause. I, however, am by no means sure if one may believe wholeheartedly in such an account, or if there is not some other cause concealed behind the one admitted, whether or not the behaviour of one partner is a reaction to an act of commission or omission of the other. Further, the question of the choice of mate, the knowledge of the reason why just this partner was chosen, is very instructive.

Finally, when I mention want of experience in both partners, and above all, that egoism in the husband who does not trouble about the satisfaction of his wife, thus giving rise to an apparent sexual frigidity in her, I believe I have cited most of the important factors, but not all by a long way.

This question interests us preponderantly in connection with our subject whether well-bred children can come from a bad marriage.

There has been no lack of authors who have brought—like *Eisler*—miscarriage or—like *Grodeck*—even abdominal pregnancy into connection with physical factors of this kind. Although most doctors assume purely physical causes for these disturbances, yet with a little reflection it is difficult to preclude altogether the demonstrations, particularly of the first-named writer ; above all, if one takes into consideration



the effect of these factors on the collective action of the hormones. As has already been mentioned, the want of a sense of pleasure might have as a result a decrease in production of glandular secretions. Since the firmness of the settlement of the fertilised ovum in the uterine mucous membrane is dependent on the vitellus; further, since the nature of this organ with internal secretion is influenced by the frame of mind, the psychical equilibrium, it seems comprehensible that a fertilised ovum in consequence of disturbances of this kind may be expelled soon after its imbedding or also at some later date. In the former case, we have a menstrual period delayed for a few days, in the other a regular miscarriage. I will not deny that both occurrences may be brought about by other causes, and stress these other possibilities expressly thus without enumerating them individually. Here, however, in connection with the formulation of our question, it is the psychical-hormonic causes which concern us.

Therefore, we may and indeed must suppose that along with many other causes, unpleasurable sexual intercourse can have a detrimental influence on the quality of the embryo, although we certainly do not want to go so far as to maintain that such an injury to the quality of children begotten in circumstances of this kind must be the case; for there are assuredly fine and perfectly healthy children of such unions. Conditions, however, to be discussed later, in another connection as lethal factors, may however have such a great effect, just as in hostility (or sexual frigidity, etc.) the product of such a union is either incapable of living, or sees the light only as an inferior being.

A practical application follows from these considerations which benefits not only the children but also the mothers; the psychical factor in the relations between husband and wife should by no means be underestimated; the marriage tie should not be strained by too many fruitless confinements; the mother or future mother should not be weakened by repeated unsuccessful attempts, and it should be remembered that pregnancies ended prematurely undermine the health, consume the reserve strength of the woman, and



result in her becoming prematurely old and faded. For every miscarriage is to be regarded as a heavy demand on a woman's body and soul. I know many doctors who, like myself, estimate its importance so highly that they have a woman given the same care after a miscarriage as after a confinement.

I would now like to mention further a number of diseased conditions in prospective parents which may be detrimental to the quality of the offspring. Certain diseases, unless they are got rid of before proceeding to procreations, make illusory those measures that I have proposed in the interests of the offspring. Timely medical treatment can, in many cases, get rid of these diseased conditions. In earlier works, I have examined thoroughly various of these abnormalities, and cannot repeat here what I said there. Also the discussion of sterility and impotence lies outside the scope of this chapter, which is occupied with the hygiene of the child to be begotten.

The most common disease, as a result of which injury to the male seminal cells may be left behind, is gonorrhœa, which will be fully discussed later.

In the case of the woman, great attention must be paid to affections of the vagina. Abnormality in its contents may occasionally damage spermatozoa, healthy in themselves, so seriously that anxiety for the offspring is justified. Many affections of the female sexual apparatus are indicated by a discharge which is characterised according to its appearance as mucous, serous, purulent or bloody. Every discharge alters the normal reaction, and this change, if it goes too far, may injure or destroy spermatozoa. The treatment of these diseases in women is often protracted. Consequently every danger of infection must as far as possible be prevented.

The same is true of exudations from the uterus. Affections of it are characterised first of all by increased mucous, serous, and finally purulent discharge which poisons or destroys the spermatozoa. Also the character of the uterine mucous membrane which is dissolved away at each



menstruation and is built up again afterwards, is of great importance for the spermatozoa.

The Fallopian tubes, the mucous membrane of which shows no marked menstrual reaction, are, in affections of the uterus, often more or less affected sympathetically, and may then not be adequate or only insufficiently so for their task : the conveyance of the ovum and its union with the semen. The narrowness and length of the oviduct, as well as its curvature, make it a point of attack for many injuries which disturb its function. One does not need to be an expert to understand that all changes which obstruct the normal course of physiological processes involve the danger that either no fecundation at all takes place, or that the fertilised ovum does not develop to a healthy sound embryo.

Hence the utmost should be done to prevent such changes from arising or to get rid of them before an intended procreation. The well-known saying, "Prevention is better than cure," is more than ever true in this case. It is not only—though in the first place—applicable with regard to diseases of the genitals but, above all, also to the question of prevention of puerperal diseases ; for these diseases, among which the effects and consequences of puerperal infection have the greatest and most serious significance, endanger the life and health of the mother during the puerperium itself as well as her capability of giving life to further healthy children.

By way of warning, let us call to mind with special emphasis the dangers to a woman's later capability of being the mother of healthy children which arise from an artificial and particularly from a criminal abortion. In spite of the threat of severe punishment, in spite of incessant medical warnings, and notwithstanding the repeated grave admonitions of clerical and secular moralists, the number of abortions is still alarmingly high ; the consequences for the women, taken altogether, are terrible and the harm done to the physique of the nation is immeasurable. If those who decide to have this interference made on them are more or (mostly) less aware of the dangers directly connected with it, then they surely hardly ever reflect that they are likewise



exposing themselves to the destruction of their highest capability as women, becoming a mother. Gynæcologists and particularly psychologists know just what this means to many women. Therefore, let the warning once more be repeated in connection with the subject being dealt with in this chapter.

We have to give special attention to menstruation. Its importance for the date of the impregnating copulation has already been emphasised. At this point, however, it must be discussed not only in so far as wrong conduct may harm the woman herself but also, in addition, how it may have an unfavourable effect on the offspring.

Menstruation has this in common with all the processes which are connected with the female act of propagation, that the normal is extraordinarily close to the morbid. To consider it as of secondary importance will not do of course, yet, on the other hand, it must not be thought of with anxiety as a disease. The healthy woman will pursue the proper middle course. She whose organs are in the main perfectly healthy feels no particular limitation during these days, apart from the discomfort of the discharge of blood going on, and scarcely any radical hygienic measures are to be recommended for her. For constitutionally weak women, on the other hand, suitable care of the body at this period is required.

Certain hygienic measures are made necessary for all women by the processes in menstruation. Since the period proceeds with the discharge of the uterine mucous membrane and, consequently, the place left by it presents a wound-surface, the greatest cleanliness is recommended. This is all the more necessary as the menstrual blood excreted lingers for a time in the bacteria-containing vagina, and is exposed to the action of germs of putrefaction already there as well as in the external genitals. The avoidance of the introduction into the vagina of objects which might convey germs of putrefaction, or worse still germs causing disease, is therefore necessary. Indeed, it is almost as important to keep the vaginal orifice, which may, in this case, be regarded



as including the "external genitals," as far as possible free from germs of this kind, as from there they may easily penetrate farther.

It would take us too far were I to try to deal with the whole hygiene of menstruation here. On this all-important point of cleanliness let only this much be said: the pads absorbing the menstrual blood should be renewed as often as external circumstances permit. Of the manufactured "sanitary towels" which are to be found on sale, which consist of cellulose covered with dressing gauze, the majority are very useful, yet not by a long way ideal. The towels mentioned have the advantage that after use they are thrown into the water closet and disappear. Thus there is no possibility of their being used again after being inadequately cleaned, as used to be the case with the home-made diapers of old linen or cotton formerly in general use. It must be admitted, however, that the "old-fashioned" home-made and washed towels have their advantages—chiefly those of being easier to fix and cheapness—and that doctors have no objection to them, provided that they are cleansed thoroughly (best done by boiling). Nevertheless, this system of absorbing the menstrual blood is capable also of improvement by means of scientific and technical advances.

Underclothes, which even with the most careful cleanliness are often soiled with menstrual blood, should be changed as often as circumstances permit; as a rule at least once daily. What we gynæcologists have to look at in this respect is often shocking. And in this respect it is by no means always women not in a position to pay sufficient attention to the cleanliness of their bodies and underclothing who are concerned.

During menstruation, the external genitals must be washed as often as possible. The water should be lukewarm; it is useful to add something to it to assist the cleansing effect and to prevent the skin and mucous membrane as far as possible from irritation and chafing. The application of a suitable skin cream can also help in this. A doctor should be consulted in the choice of such a specific.

The physical exertion necessary for normal life need not



be prohibited. In a number of women and girls, moreover, an increased desire for rest will prevent excessive exertion. Nevertheless, I must advise even the healthiest against any over-exertion. Women for whom menstruation has from the beginning been associated with a feeling of illness must be advised to spare themselves. Attempts to get rid of this restriction by being energetic are in most cases made only with great sacrifices but made in vain and the discomfort is merely prolonged. The causes of these disturbances are various and cannot be diagnosed without consulting a doctor. This consultation should not be omitted, for the neglect of an actual disease in these circumstances is just as wrong as indulging one's inclinations and suffering pain. In most cases, the doctor will be able to give relief without much difficulty. A great proportion of these menstruation troubles are due to psychical causes ; behind them, however, various diseases of women may also be hidden.

The devastation which diseases of the genitals cause in the body of the individual is so serious, so varied in its effect, that we cannot pass these contagious diseases by. Although here they interest us chiefly from the point of view of procreation and in regard to the offspring, yet a preliminary survey of their nature must be given so that my deductions may be better understood.

Gonorrhœa as the most common malady may be discussed first. Nowadays, we know that this malady can, in certain circumstances, cause such serious changes in the body of husband and wife that the opinion of many old doctors who characterised gonorrhœa as a children's disease in the adult has been abandoned. Efforts are even made in various countries to check the evil by State measures of various kinds, because not only the immense harm and danger for the victims but also to the offspring has been recognised. Gonorrhœa is the commonest cause of sterility in man and woman ; it can bring about serious affections of vitally important organs ; the prospects of cure are satisfactory only if medical treatment takes place at once and is carried on to complete recovery. The infectiousness fluctuates



extraordinarily ; it may happen that an old infection latent for years, which was apparently quite cured, revives again and becomes infectious anew without any recognisable cause. There are married couples who have infected each other but show no more symptoms of the disease ; it has become relatively inactive. If a third comes into this marriage, however, it may happen that he expiates the adultery with a serious infection. In this disease, there is scarcely a norm ; individual infections follow different courses and it appears as if the infectivity of the existing cause varies very greatly. Nevertheless, one can speak of typical courses which then hold good for fresh cases.

A certain germ—the gonococcus—was described by *Neisser* as the exciter of this infection, and its stainable and biological peculiarities are so widely known that the clinical diagnosis in each case can and should be confirmed by proof of its presence. Then, since the germ is an inhabitant of mucous membrane only, since its viability disappears very quickly by drying, the possibilities of infection are fairly restricted : sexual intercourse, unclean (*i.e.*, contaminated with this germ) fingers or instruments, towels, sponges, bidets, etc.

Two factors are decisive for the development of the infection : the power of resistance of the individual infected and the nature of the existing cause—that is of the infecting breed of gonococci—which often alters in virulence. The possibility of an inherent or acquired immunity cannot be contested. It is so rare, however, that it hardly comes into question in practice. The observation that infections from similar sources sometimes follow a slighter, sometimes a more serious course doubtless tells in favour of a certain defensive power in the organism of the individual ; nevertheless, one cannot rely upon it, as the natural protective measures of the body may be diminished by illness or by outside influences. In consequence of the varying virulence of the exciting cause and the difference in the defensive power of the infected body, the form of the disease sometimes proceeds very quickly, sometimes much more slowly. Separate outbursts set in later, for example, in connection



with a harmless cold or as the result of a morbid condition insignificant in itself.

When the exciting cause has settled on a mucous membrane which suits it, then it can, by developing further, get into the bladder from the urethra, from the vagina into the uterus and from there into the Fallopian tube; it can be conveyed through the blood stream into the joints, to the heart, to the brain. Transport to the lymph-tracks is also possible. Finally, the pus containing the germ can be transmitted by fingers, under linen, etc., from the genitals to the eyelids and there evoke a specific inflammation of the eyes.

In women, there is really no period of incubation (as the time between infection of the disease and its becoming visible is called), for within twenty-four hours from the introduction of the germ, morbid pus corpuscles and epithelial cells can be demonstrated. Nevertheless, the first of the more serious symptoms set in three or four days after the infection. The same holds good for men with the exception of those cases where the weakened germs produce inflammation only after ten to twenty-one days.\*

\* Whilst engaged in correcting these proofs, I read in a particularly interesting essay by *G. Rahlwes* (Hanover) in the "Medizinischen Welt," 1934, No. 35, regarding the alteration which has taken place in recent years in the rise and course of gonorrhœa in men whilst the disease has scarcely changed in women.

"Gonorrhœa in men was an acute affection of the urethra which proceeded with violent, inflammatory symptoms which reached their climax at the end of the third week to die away towards the end of the fifth week. Then the new rather less high epithelial layer free from gonorrhœa had formed. The time of incubation amounted to 48 hours to 3 or, more rarely, 5 days.

"This urethritis, often very violent and attended with a high amount of secretion, has nowadays become from the beginning a lingering, at any rate in comparison with the former, affection subacute in its course, the slight pains and scanty secretion of which are often scarcely noticeable.

"The time of incubation rarely amounts to two or three days. As a rule, after four or five days, or even after the lapse of a whole week, the first symptoms of disease appear. And the rarity at one time: an incubation period of one to two weeks almost every practitioner in our time has seen! *The beginning, which is shown by a slight burning only in micturition, is often overlooked at first, and the scanty secretion is taken for a harmless catarrh of the urethra. This conception has a particularly unhappy effect if the victim consults, instead of his doctor, older acquaintances or the encyclopedia, both of which still subscribe to the old opinions. He is then inclined to regard this—de facto—treacherous and lingering beginning as a specially favourable sign just in his own case. Hence, too, he thinks he is not obliged to carry out correctly the treatment prescribed by the doctor and thus gives the*



In women too, all violently acute symptoms of the fresh infection may be absent, that is to say, in those cases the course of the disease is slow.

The typical gonorrhœal infections in women proceed as follows: The disease in most cases first attacks the urethra, causes swelling and painfulness there and, in addition, disturbances in micturition as well as a more or less copious production of pus. As a rule, these symptoms for the most part disappear of themselves after the pain, sometimes considerable, has abated. Meanwhile, however, the little mucous glands in the neighbourhood of the urethra have become infected, their orifices reddened, the glands themselves filled with pus.

The vaginal walls, on the other hand, in the normal woman are, as a rule, spared from the actual gonorrhœal infection, as the germs cannot insinuate themselves there. The pus which the vagina contains comes from the neighbourhood, especially from the canal of the uterine cervix.

This canal is in most cases also attacked by gonorrhœa, and in acute stages it discharges quantities of pus which, after very long continuance of the disease, changes in appearance and quantity, for the most part loses its strictly purulent character and becomes more mucoid. Finally, as the last symptom, only an increased secretion is left behind.

The spread of the disease to the mucous membrane of the uterus is serious. The germs settle in the mucous membrane, and rapidly penetrate into the depths of the tissue.

*gonococci time to develop more than ever, as well as to establish themselves in the recesses of the mucous glands. Later, these gonococci, hidden in the glands and at first little combated, make the continual recurrences." (The italics are mine.—V. de V.)*

Briefly, it may be said: Gonorrhœa in men has in its nature to a great extent drawn nearer to the gonorrhœa in women.

In all these considerations the question as to the cause of the incisive changes which have arisen in such a relatively short time in this disease so important in this respect obtrudes itself involuntarily. Has the virulence of the gonococci abated or does man's organism not defend itself sufficiently? These discussions of a theoretical kind naturally cannot be examined thoroughly here. Only so much may be mentioned that the collation and comparison respectively of careful observations of the disease in various places in the course of about 20 years seems to indicate that the natural defensive power of the body is weaker in function than formerly."



The great quantity of the excretion prevents any new formation of mucous membrane. Not till a few weeks after fresh symptoms have died down does it regenerate itself normally. It is then superficially free from germs, but from the deeper layers these may at any time lead to a revival of the process in which, however, the symptoms grow gradually weaker. The mucous membrane changed by the inflammation is, however, devitalized; either it cannot admit a fertilised ovum or if an implantation does take place, then, in most cases, the nidus is defective and development is interrupted.

Likewise, the mucous membrane of the Fallopian tube responds with swelling and disintegration when the germs of gonorrhœa settle in it. Almost always the swelling closes up the Fallopian tube. The cavity is filled with pus, the wall very delicate before, swells, thickens and loses its spontaneous movement. At the beginning of the inflammation, the pus flows from the tubal orifices into the abdominal cavity, the infection goes on to the peritoneum. Apart from the swelling, the fimbriated ends of the Fallopian tube thicken, they adhere to one another and also close up the Fallopian tube towards the abdominal cavity. The tube-sacs filled with pus become distended to many times their circumference, the orifice to the uterus which is normally already very narrow, becomes closed owing to the swelling of the mucous membrane. Exudations from both the tubes and the peritoneum are then soon replaced by connective tissue, and the result finally is a mass of adhesions.

With the affection of the Fallopian tube, which, in most cases, sets in bilaterally, is usually associated inflammation of the ovaries. The germs first occupy their surface but also frequently reach the recesses, and cause inflammations which may result in the formation of abscesses in the ovary, and generally cause the organ to adhere to its surroundings. The thickening of the surface of the ovary prevents the maturation and bursting of the membranes of the ovum, whilst, on the other hand, the inflammation may cause precipitate and imperfect maturation. As a result of interrupted ovulation, menstruation becomes



irregular. The adhesions and swellings make of the internal genitals a painful conglomerate mass, and every activity of these organs, such as, for example, ovulation and menstruation, proceeds with violent pains, rises in temperature and revival of the inflammation. The painfulness of the illness, and the flooding of the body with the poisons formed by the germs, are a grave danger to health.

The processes described in the foregoing are, as has already been mentioned, merely a possibility, for gonorrhœal infection does not always proceed with these violent symptoms. In the majority of cases, the natural defensive powers of the organism prevent the spread of the germs to neighbouring parts of the female sexual apparatus. But none the less this quiescent infection, owing to some occurrence, for example a miscarriage, a confinement, sometimes even a menstruation, may lose its non-malignant character and then cause one of the above-mentioned subsequent illnesses.

It is clear that serious changes in the inner generative organs, among others the complete closure of the Fallopian tube alone, must cause the absolute sterility of the woman afflicted with them. Yet although—in less serious cases—fecundation is not entirely precluded, according to the exposition given, the possibility of injuries to the egg-cells as a result of gonorrhœa is obvious. These injuries may befall the ova not only during any phase of their development but also on their way to the uterus. The inflammatory process, if the occasion should arise, hastens the maturation of the ovum as a result of the congestion of blood in the affected organ and its neighbourhood; the danger exists that such ova are defective because they leave their nutrient medium and their protective apparatus prematurely. If they are fertilised in spite of this, then, owing to their feebleness, they will no doubt perish at or shortly after implantation in the uterine mucous membrane. The mucous membrane itself, however, as I have already mentioned, is defective in its structure after a gonorrhœal infection; hence, it may easily happen that it is not equal to the demand made by the rapidly enlarging ovum; and moreover, in consequence



of this, the expulsion of the embryo takes place with hæmorrhage in the first weeks of pregnancy.

In many slighter cases of female gonorrhœa, in spite of the difficulties which exist even then, a normal fertilisation takes place and the pregnancy goes on uninterrupted. While it is going on, the child is not directly endangered. The mother's infection cannot harm it, since it is protected by its amniotic membranes and by the placenta which acts as a filter. It is different however when, during parturition, the unavoidable direct contact with the vaginal mucous membrane and uterine secretions takes place. For, on the way through the narrow genital passage, the mother's infectious mucus is easily pressed between the child's eyelids. The dreaded inflammation of the eyes, which even a few centuries ago deprived a high percentage of all new-born babes of their eyesight, is the result, unless this danger is removed by prophylactic treatment, which should take place immediately after birth, and can be carried out by every midwife. New-born girls, moreover, may at birth get an infection of their genitals from the same cause.

Gonorrhœal infection in men produces only in exceptional cases serious symptoms. The fresh infection shows itself as suppuration from the urethra, and is accompanied by pain and swelling of the penis. Swelling and inflammation of the lymph glands prove that the disease is not confined to the sexual apparatus. However, in most cases—although not all—germs are prevented from settling in more remote organs by the formation of protective substances which destroy such as get into the blood. Hence, as a rule, the infection is confined to the sexual apparatus, the various parts of which may be attacked by the germs. The effect of male gonorrhœa is precisely similar to that of female. In the early stage, the spermatozoa are injured or destroyed by the pus in the manner already described, but the chronic form, too, has the same effect, as the formation of pus, although not in the same volume, continues for a long time. Further, the prostatic glands, the secretions of which after union with the spermatozoa make the latter motile, either produce secretions containing pus or become



atrophied as a result of the numerous attacks of inflammation, so that the chronic form of gonorrhœal infection is in every case characterised by injury to the semen. As a result of inflammation of the epididymis, complete closure of this organ is not infrequently produced, so that it cannot fulfil its task of conveying the spermatozoa onwards. Male sterility is to be regarded as the most frequent result of gonorrhœa, which has not had treatment or not been completely cured.

If we sum up, we see that as a result of this much underestimated disease in both sexes, long-continued suppurations appear which do the body serious harm, damage the urinary apparatus considerably, and may bring about more or less serious inflammatory dangers in important organs remote from the first focus of infection. The ova and sperm cells are in every case affected sympathetically, and that as long as either new or old inflammatory symptoms (and their consequences) are present. In both sexes, then, sterility often results, a condition which we really ought to welcome inasmuch as serious inflammatory changes may be detrimental to the spermatoblast and cause deterioration of its quality. Although there can be no question of transmissibility in this disease, yet the damage it causes is of such a kind that all processes connected with copulation and the act of delivery may be complicated by it, and one must for this reason be apprehensive about the fate of the offspring.

Whilst gonorrhœa causes preponderately local changes and, in most cases, a general affection is rare, another disease of the genitals shows a wholly different procedure. The serious harm done by syphilis as a rule does not appear till later. The earliest manifestation, which, in a man, usually appears in the genitals and is the first sign of the existence of the infection, may occasionally proceed almost unnoticed; in women, it can be proved only by a suitable examination, since it is in most cases situated in the vaginal portion of the uterus. The so-called secondary stage often proceeds just as mildly, whereby the typical skin eruption is misunderstood by the inexperienced, since it, like the



first manifestation, disappears after a short existence and is not accompanied by any marked sensation of illness. Not till later when the symptoms of a serious local affection (*e.g.*, cardiac, cerebral or spinal cord phenomena) appear is the doctor called in ; and at this stage he can do little or nothing. Hence it must be pointed out, to start with, that anyone who has been exposed to the possibility of an infection must not treat lightly symptoms of the kind mentioned, and should also consult a doctor in case of the slightest signs. Moreover, the initial symptoms in by far the majority of cases do make themselves plainly perceptible ; also the onset of the secondary stage proceeds with considerable symptoms of disease. People must not neglect them from fear or carelessness.

In comparison with gonorrhœa, conception in syphilis is much less often prevented, yet the embryo is much more seriously harmed, so that it is a general truth that untreated syphilitic parents will never bring healthy offspring into the world. The first pregnancies frequently end in miscarriages, only the third or fourth may reach the normal termination, yet the children are for the most part so seriously affected or predisposed to disease that they succumb at an early age either to their hereditary syphilis or to some simple intercurrent malady. The enumeration of the pathological changes which may manifest themselves in every organ would vastly exceed the scope of this chapter ; it is sufficient to state that an apparently healthy child of syphilitic parents is tainted to such an extent with abnormalities that very careful supervision of its later development is essential. The harm unfortunately does not end with the first generation ; grandchildren and great-grandchildren are also seriously endangered. This observation, which is unhappily verified a thousandfold by clinical experience, makes it impossible to estimate the magnitude of the danger which threatens individuals and the race from this disease. It is now generally known that in the present state of our knowledge it is quite possible to combat syphilis successfully. Effective weapons have been put into our hands which are used with the better prospects of



success the younger the disease is. Even during pregnancy we can, by suitable treatment, protect the embryo endangered by syphilis from this serious hereditary disease; indeed, we can still cure isolated phenomena of hereditary syphilis with success even after birth, if the child comes into the world moderately viable.

From what has been said here of the two most important diseases of the genitals, there are four conclusions: (1) People should avoid the danger of being infected through sexual intercourse by remembering the seriousness of this danger at every moment and in all circumstances; (2) if an infection has, nevertheless, taken place, they should immediately resort to medical treatment and have this continued till completely cured; (3) they should always be conscious of their responsibility to others and not expose anybody to the risk of infection; (4) they should refrain from procreation as long as a child may come into existence injured as a result of the disease.

Perhaps many readers may raise objection to the discussion of various diseases here given by thinking that the mention of horrible and unpleasant things cannot possibly strengthen the individual's will to procreate; and that the glimpse of this inferno may draw attention to dangers of which we do not want to know, because the responsibility of the individual to himself and to his offspring seems thereby to become too great. Now anybody who leaves the inherited characters of his child to chance will be unlikely to take up this book. Greater sense of responsibility ennobles the possessor, and the desire to save one's child from all hardship, to protect it by increased strength and beauty of body and mind from the dangers which have had an unfavourable influence on the parents' course of life, is innate in every true human being. It thus follows that the conscious avoidance of knowledge of these things must be equivalent to that hopeless pessimism which would cast doubts upon what is greatest and finest in mankind.

In recommending intentional procreation, I would not,



however, wish to arouse in the reader's mind the impression that I regard this alone as admissible, and would at all consider unintentional fecundation as a misfortune. I spoke earlier of the children of love and mentioned their often striking advantages. In this, I emphasised that so far science could not yet explain this phenomenon satisfactorily ; but that the assumption that intimate physical and psychical sympathy between the parents provides excellent qualities for the product of their union has been justified by daily observation. Therefore it must be emphasised that close affection may also accompany a coitus of which the time and preliminary conditions have more or less been decided in advance. I should be unhappy if I had given even one of my readers the impression that the intentional act of procreation should be done as a duty, that the physical union should lack the spiritual.

Nevertheless, I must emphasise the fact that the absence of an actual transport of love in procreation by no means admits the inference of diminished qualities in the offspring, just as, conversely, children begotten in the most favourable conditions occasionally disappoint high expectations, for the importance of the various factors can in individual cases not be estimated with accuracy. As we know, many an inferior child has, in the course of its later development, given the lie to dismal predictions. Experience frequently tells in favour of the fact that inferior primary characters can be made good by training, so that later scarcely a trace of earlier weakness can be seen—unless we are to comprehend the over-accentuation of the capacities acquired later and the special pride in the increased ability as a sign of the original insufficiency. Ordinary daily life shows the attentive observer numerous proofs of the truth of this rule ; in this connection may be mentioned the example of the Athenian orator *Demosthenes*, of whom it is recorded that in spite of his defect in speech, which he adjusted by constant practice, he became the best orator of his time. History tells of physically insignificant men who, by their energy, acquired dominant positions (Napoleon, Prince Eugene, Cæsar). Even the individual organ endeavours to cover a



defect by a maximum of strength, an increased efficiency. A broken bone is supported at the fractured place by a specially strong cicatrisation so that greater force is needed to break it a second time at the same place. The heart injured by the results of an inflammation can, by an increase in its muscular substance, postpone its failure for a long time. Thus, the same holds good both for the individual organ and for character ; and we may add also for all the physical and mental capacities of man only so far as the will to overcome a congenital weakness is inherent in him. This may be said for the comfort and consolation of all those parents who worry about the quality of their existing or future offspring, and those people who become conscious at any time of a certain weakness in their physical or psychical qualities.

Also let it be kept in mind by eugenists who recommend artificial abortion in apparently unfavourable or inopportune pregnancy. At this favourable moment, let it be repeated that so many and such great dangers of various kinds are associated with the interruption of pregnancy, that, looked at from the medical point of view, in my opinion it can come into consideration only where the life of the mother would be lost without this interference.

We have, finally, still another important question to discuss which at the present day is of no slight importance to many people : the question of the lot of children resulting from conceptions in which attempts have been made to prevent them.

Besides certain other disadvantages, above all, that of uncertainty is connected with contraceptives. Pregnancy can occur in spite of the use of such measures, either because the method of prevention itself has been unreliable or because its application took place wrongly. In recent years, deformities in children have been ascribed to the ineffectual use of certain specifics, and because the parents concerned had begotten healthy children before and after, people have been inclined to suppose a connection between the ineffectual contraceptive and the appearance of the deformity. I know numerous doctors who have seen



pregnancy take place in such circumstances but have never been able to observe this effect. The literature of the last decade, however, records six cases in which an injury to the embryo from this cause is supposed to have been probable or certain. In my opinion, these cases are not sufficient either qualitatively or quantitatively for the causal connection between contraceptives and deformities. Moreover, the great love of publicity in doctors would hardly have kept a further case secret. If we consider, however, that thousands upon thousands use the various specifics, and a great percentage of them, whether from carelessness or ignorance, use the methods badly, we must come to the conclusion that if contraceptives damaged the ovum then the number of deformed children who come into the world would have been very great. How very wrong this is thousands of parents to whom this "failure" has happened are fortunately able to verify. The chemical contraceptives are (comparatively) so very effective that if they are able to act on the spermatozoa they also kill them. And so far as the mechanical expedients are concerned, the worst effect which would occur with the failure of pessary or condom would be the prolongation of the passage along which the spermatozoa had to travel. We shall even see in the fifth chapter that, in certain circumstances, efforts may be made to prolong the passage although not by these means. Thus, though I think I can soothe anxious minds in this respect, yet, on the other hand, I must point out the great danger of all methods of preventing impregnation. That is, the dread of impregnation in spite of every assurance of the reliability of the means used can never be wholly banished, and this very fear disturbs in many married couples the sensation of exaltation appertaining to copulation.

Further space may be given here to an observation which is confirmed by numerous psychologists: children begotten in spite of the use of contraceptives react with strong emotion to the information that their birth was undesired. There are cases known where a serious attempt at suicide followed this communication. Then, again, it has been observed that existing or suppressed feelings of hatred for



the parents have been highly intensified and the fear that these children would seek their parents' lives justified. Less serious but still very thoroughgoing conflicts of this kind are exceedingly numerous. It is unquestionably the duty of the parents to avoid disclosure of this kind in any circumstances.

This little extension regarding observations supplementary to our subject may lead to a few further words about the mental hygiene of conception. I have already indicated above the desirability of having a period of relaxation and change of environment preceding conception by emphasising the great value of mental change of air for this period. Nevertheless, I must outline with a few suggestions still other conformities to rule which seem to me to be of some importance to our subject. The psychology of the unconscious is based on the knowledge that along with the conscious desires, hopes, aspirations, others are present for which we shall assume, for the sake of brevity, the opposite direction; that is to say, the conscious desire for a child may be opposed to the contrary but unconscious mental sense, *i.e.*, dread of the child. Now this latter may take effect in various circumstances. For the sake of simplicity, we will illustrate this by a little practical example whereby I would like to remark that the following example by no means represents an exceptional case. In spite of a strong desire for the child, a young wife showed shortly after becoming pregnant an increasing depression which caused the people about her to get medical advice as they feared a serious mental disease. The psychological examination, however, revealed that the wife had had for a long time a feeling of strangeness towards her husband, and she had subconsciously not yet been satisfied with the fact of her marriage. She therefore shifted the emotion of antipathy from her husband to the child, because she considered it would strengthen the marriage tie, and a dissolution of the marriage, subconsciously taken into consideration by her, could therefore only be carried out with great difficulty after she had given birth to the child. Subconscious aspirations



of this kind complicate pregnancy now and then, but they may also have a disadvantageous effect during the later development of the embryo, hinder valuable primary characters in their growth, and intensify the feelings of hatred innate in all human beings. Now, by turning this line of thought to good account in practice, I would recommend the greatest possible candour with oneself in this point; I would advocate that the prospective parents should confess—not to each other but only under psychotherapeutic guidance—all their conscious aversions and animosities, from a realisation that knowledge of these downward-tending trains of thought has a liberating and purging effect, and certainly, in many cases, is able to paralyse their effects. Where there is an earnest desire for honesty with oneself, they may easily be inferred since they are often betrayed by baseless antipathy, by fits of anger following a secondary cause, by day dreams in which, in place of one's own partner, a stranger plays a more or less distinct part. It may, of course, happen that these symptoms are not unequivocally confined to aversion to the husband (or wife); they may just as well correspond to the urge for freedom innate in every human being. Nevertheless, I think I must point out these difficulties, in order to stimulate the more profound mental promptings of the future mother towards her sacred and sublime task.

In this sense, I desire of every woman that she should experience her longing for a child, not only with every fibre of her body but also with every impulse of her soul; and that she also should be conscious of awaiting a new being, of conceiving a real individual, something indivisible, unique. Let parents keep before them as a motto, *Nietzsche's* words: "Marriage is the desire of two to create one greater than those who create it." Then will the child, which is destined to be born by special forethought, do justice to its essential duty not only to fashion a valuable life for itself but also to be a worthy member of its family, its nation and mankind. Only when the parents have been equal to their essential—and hardest—duties: to hope for everything and demand nothing; only when they do not burden their



child's existence with claims, when they can restrain selfish expectations, only then can this child rise to expectation. For they set free energies in their child which act not against them but for them. And if their child is begotten on a "holiday," if its birth is really a joyful event, then will its days indeed be an inexhaustible source of joy not only to itself, not only to its parents, not only to the family, but also to the race and mankind.



## CHAPTER III

### CARE OF THE HEALTH OF THE UNBORN CHILD (PRE-NATAL HYGIENE)

#### *How Can the Unborn Child Best Develop?*

“EVERYBODY will agree with me that it would be very improper for a doctor to date the life of a human being, as the parochial registers do, from the time when it sees the light of the world; that rather, for the doctor, it exists, lives and makes demands on his attention and foresight with the very first imperceptible beginning of its procreation. Why do we not give it these earlier, and not, as is usual, only when it has become a visible and audible member of human society? Indeed, I have no hesitation in asserting that this pre-natal treatment is still more important than the subsequent.”

This, written more than a century ago by an old physician, *Christoph Wilhelm Hufeland*, one of the greatest of his time, out of the fulness of his experience was, at that time, a courageous expression of opinion, for the recognition of the growing human embryo as a rightful human being did not take place till during the nineteenth century. Up to the year 1869, the Church upheld the distinction between the foetus with a soul and that without a soul; and thus it is little wonder that the medical world at that time also paid no great attention to the child in the womb, although it goes without saying that its preservation was valued. Mankind, however, was then still so prolific that the life of the individual child played a comparatively insignificant part. Nowadays, the peoples of all civilised countries have learnt that the life of every single child is of value not only for its parents but also for the nation. Therefore, they support all measures which can lead to the “good birth” of the individual. In the end, all public care for pregnancy



must come to care for the individual, for only by the individual mother being properly treated, and by her acting properly before and during pregnancy, can a healthy rising generation be promoted.

The significance of the choice of a healthy mate and the importance of healthy ancestors has already been gone into in previous chapters. Consequently, we presume these preliminary conditions to be known and in this chapter we are mainly concerned with the health of the child in the uterus. Everything that concerns the mother passes on also to the developing child. Each one of her acts exerts an influence in some form on the unborn child. In everything she does, whenever she takes her food, she must consider : am I being of use or of harm to my child by this ; and she must weigh carefully the importance of perhaps contradictory interests. This is sometimes difficult, especially for the woman who is to be a mother for the first time. For, where is she to get her knowledge of what is good and beneficial for herself and at the same time not harmful to her child ? Obviously she must ask advice from somebody who can tell her, and so it is best to have recourse to a doctor of experience. Unfortunately, there still exists in the circles of the good bourgeoisie, in almost to a greater degree than in the working classes, a dread of getting advice from the proper source.

Whether advisory bureaux for pregnant women are organised by the State or by town councils, or whether the task of giving advice to pregnant women devolves upon the individual doctor in the consulting room, is, in the end, a matter of indifference ; for, in either case, the advice will always be given by doctors who have the desire to make the period of pregnancy as free from danger and as little unpleasant as possible for every woman, and who feel responsible for the life of the child developing in her uterus. It seems also to be of importance that a bond of trust should exist between doctor and mother, for only thus can there be a real guarantee that the mother has recourse to the doctor in every problem, and discusses with him all the difficulties which crop up.

If medical care for mother and child during the whole



period of pregnancy is important, then it must be of still greater value in the last months. Complications and difficulties which threaten in this period can, in most cases, if recognised in time, be avoided or alleviated.

Not only the woman who must continue to carry on a profession during pregnancy, but the mere housewife also, the physical demands on whom are underestimated by most men, needs medical advice, medical supervision. For this supervision, in my opinion, the family doctor is best, for he knows not only the wife, but also the husband and the rest of the family. He can best foresee the predisposition of the child up to a certain degree, and give simple advice which is often of more benefit than complicated medicines.

There is no doubt that we can influence the child extensively during pregnancy by our measures, for, as has already been said, everything the mother does also acts on the child. We know that the majority of medicines, especially the poisons, pass through the circulation of the blood of the mother into that of the child, and can be sensibly harmful to the delicate organism still in process of development ; while, on the other hand, methods of treatment used with the mother extend curatively to the health of the child. It is, therefore, of outstanding importance to diagnose betimes certain diseases of the mother, and to provide a cure for them during pregnancy.

To have a child of syphilitic parents come into the world healthy, it is necessary to carry out an anti-syphilitic treatment in the first months of pregnancy. It often happens that even the most careful examination of the blood gives no proof of existing syphilis, and in spite of this a child is born tainted with this disease. Usually, in this case, it is a question of silence having been kept about an infection which had occurred earlier. Therefore, one cannot take measures too often against the widespread idea that an infection of the genitals is a disgrace which must be concealed as far as possible, even from the doctor in attendance. An infection of the genitals is often a great misfortune, but no disgrace ; and the diseases of the genitals are so widespread in many



civilised countries, particularly in the large cities and sea-ports, that one can almost call it luck when a family is free from them. Consequently, anyone who has ever had such a disease owes it to himself and to his children to inform the doctor who is attending the prospective mother during pregnancy, even when the trouble has, to the best of human and medical knowledge, been completely cured before marriage was entered upon. The doctor will then decide whether further treatment is necessary. In the first five months of pregnancy, an anti-syphilitic cure has particularly good prospects of success. It is supposed that the spirochætes (the excitors of syphilis) are not able to penetrate the dividing wall between the maternal organism and that of the child till the second half of the pregnancy, and that the excitors circulating in the mother's blood in the early months are killed off before they reach the child's circulation. Later, either the syphilis-excitors become more virulent owing to the altered metabolism, or the exchange of blood between mother and child is made so much more active owing to the greater quantity of nourishment needed by the child, that the placenta can no longer offer the necessary resistance to the noxious causes.

In all cases of old-cured syphilis, or of still existing syphilis, it is necessary in pregnancy to make a thorough and repeated examination of the blood. It is even claimed with a certain amount of justice by many clinicians that in every pregnant woman a serum examination should be made in the first months, especially as, later, such an examination is no longer of positive value, for, owing to the altered serological conditions, an infection may then be simulated.

Gonorrhœa can also be aggravated in pregnancy, and particularly in childbed. Gonorrhœa is not actually transmissible, but is highly contagious; and, at parturition, especially for the eyes and, in a lesser degree also, for the vagina of the new-born child. A high percentage of the inmates of asylums for the blind have been infected at their birth by gonorrhœa in the mother, and, as a result, become incurably blind.

The number of cases affected by gonorrhœal inflammation



of the conjunctiva has been considerably reduced owing to the fact that in most continental countries, putting drops of a silver-solution into the eyes of new-born babes is required by law ; but, either because of carelessness or laziness, it still happens that the prescribed administration of drops is not, or not properly, carried out. Indeed, there are even parents who regard it as a personal insult. Nobody should evade this duty. A sensible midwife will not waste words about it, but carry out the duty imposed by law. I would like, however, to create in the circle of my readers a better understanding of the necessity for this being done.

Naturally, it is better so long as there is existing gonorrhœa or syphilis that no pregnancy occurs. When it has occurred, however, then it is a question of observing also all precautionary rules, in order to bring it to a successful end in spite of the aggravating circumstances. An existing syphilis may be the cause of numerous miscarriages, premature or still births ; gonorrhœa can lead to "one child sterility." Both can be avoided by timely treatment.

There are, however, still other causes of miscarriages, premature and still births which are not always recognised and investigated. Leaving aside accidents which, owing to the great physical shock to the mother, may effect a premature separation of the placenta, we have still all kinds of disturbances of nutrition, as well as acute illnesses of the mother, to take into consideration.

The most uncommon are no doubt the disturbances caused by wrong nutrition of the mother, for experience shows that the embryo—even to the detriment of the mother—is able to get the necessary food substances from her organism. It is probably common knowledge that in consequence of the great supply of lime which the child needs for the structure of its bones, maladies due to want of lime, such as diseases of the teeth and softening of the bones, may occur in the mother. Besides the lime, there is also a deficiency in vitamin "D" in these cases. Women deficient in vitamin "A" are said to have a particular tendency to infectious diseases, among others to puerperal fever, a point of particular interest for our consideration inasmuch



as the death of the embryo in the uterus may be caused by acute feverish illnesses in pregnancy. But puerperal fever, too, is highly detrimental to the new-born babe ; just because a healthy child requires a healthy mother, and, for its nutrition, the capability of suckling should not be impaired by illness.

American investigators have demonstrated in the case of rats that a deficiency in vitamin " B " may cause miscarriage, premature birth, or premature death of the young brought into the world. These facts concern not only the animal kingdom but the human young, for they may also be endangered in the highest degree by vitamin deficiency in the mother, and healthy rearing thereby made doubtful.

Therefore the modern doctor gives particular attention to the nutrition of the pregnant woman ; and he will continually insist on her food containing all the substances necessary for building up in particular the vitally important vitamins. On the other hand, however, by proper feeding, the child can be influenced in such a way that too great growth is prevented, and the weight at birth kept within bounds, which guarantees an easy delivery and the least possible injury at birth.

This method of feeding, first described by *Prochownik*, is at the present day a question not absolutely settled. It is stated that the great experiment during the War gave counter evidence ; and the fact that the child can get through to the detriment of the mother and at her expense, is beyond question. Indeed, I have often enough been able to make the same observation. Nevertheless, *Prochownik's* fundamental idea is sound. The doctors who are able to observe their patients from the beginning of pregnancy to the end continually state that, where the suggestions for nourishment are respected, the weight at birth has always kept within moderate limits.

Modern dietetics has in general given proof that it depends less on the quantity than on the quality and composition of the food, when one wants to get a certain result. The point of view from which we must start in diet in pregnancy now is this : that building up the tissues of the mother and



child from starchy substances such as we find chiefly in potatoes and bread is to be deprecated. Also an excess of animal albumen, as well as great quantities of fluids, has to be avoided. On the other hand, one can never give enough food rich in vitamins. The bill of fare to which it is best to keep looks something like this :

In the morning before getting up :

(1) A rusk and a small plate of stewed fruit.

*Breakfast* : Coffee, substitute, tea with cream and sugar, 10 gr. (two teaspoonfuls). One slice of wholemeal or crisp bread with plenty of butter ; a little honey or jam ; a soft boiled egg occasionally.

*Mid-morning Luncheon* : 200 gr. fruit (about 7 ozs.) or a glass of milk.

*Mid-day Meal* : Meat (two or three times a week), 100 gr. (about 3½ ozs.), otherwise 150 gr. fish (5½ ozs. approx.) or egg dishes made from two eggs. Plenty of vegetables and salad without flour, prepared with fresh butter or oil or perhaps vegetable fat. 100 gr. (about 3½ ozs.) potato or 50 gr. (1¾ ozs.) macaroni, semolina, rice, etc. Fresh or stewed fruit *ad lib*.

*Tea* : Tea or coffee (as free from caffeine as possible), cream, 10 gr. sugar. 50 gr. bread and butter or pastry.

*Supper* : A good portion of vegetables or salad, prepared as above. Light egg dishes ; mild varieties of cheese ; 50 gr. bread ; butter ; fresh or stewed fruit.

The food accessible to most people during the War did not correspond to the guiding principles laid down above ; in order to be satisfied at all, people had to stuff themselves with potatoes and substitutes ; fruit and vegetables were in general unattainable in the winter months, not to mention fat.

Besides fruit, vegetables and butter, the sun is the greatest dispenser of vitamins. The young people of the present day have rightly understood the body's need for sun, and consequently brought into being a true worship of the sun, which is fundamentally good but, in excess, can be even harmful. At any rate, the pregnant woman must be



protected from sunburn such as occurs too often after warm sunny days. As we now know, the skin is just as important for the metabolism of the body as the lungs and stomach; it can absorb substances and gives off by evaporation, which need not necessarily be accompanied by violent perspiration, substances which might otherwise cause disease. By excessive exposure to the sun's rays, it may be disturbed in this function. The pregnant woman, however, needs this exchange by means of the skin to a particularly great extent. She should take careful air and sun baths, which, in winter, may be supplemented by artificial sunlight in order that the child may come into the world with a body capable of resistance. She should also, by proper care, baths and washing, keep her skin clean and capable of absorbing the vitalising rays of energy.

As sport in its various forms might easily endanger the child by too quick or too violent movement, it should be given up as such, but not the physical exercise which is the basis of all sport. On the other hand, gymnastics are important, but they must be adapted to the physical needs, as I have stated in my book "Sex Efficiency through Exercises." I go into this more fully in another chapter, but would like to emphasise here only the special importance of all breathing exercises, as, by means of them, the interchange of gases in the blood is promoted not only in the mother, but also between mother and child, and hence in the child itself.

The regulation of metabolism in the mother is naturally also important for the child. In particular, care must be taken for satisfactory elimination of all waste matter. If this is not done, if the intestines and bladder are not sufficiently evacuated, then there is danger of self-poisoning, which also passes to the child. If, that is to say, substances destined for removal remain too long in the intestines, then the poisonous substances which they contain are absorbed by the intestinal wall; they reach the blood, and from there they may have an injurious effect not only on the mother's body, but also on that of the child. It is nevertheless strictly forbidden to take violent purgatives in pregnancy.



No matter whether the purgative is vegetable or mineral, it stimulates the peristalsis (wave-like movement in circles) not only of the intestines, but also of the uterus; and if a number of mischances coincide, it may come to a premature detachment of the ovule, a miscarriage or premature birth.

Unfortunately, in the first months of pregnancy, obstinate constipation often occurs, mainly caused no doubt by the pressure of the swelling uterus on the rectum. In this, assistance can easily be given by an enema (clyster). For this one takes  $\frac{1}{2}$  to 1 pint of lukewarm water (temperature of the body) or, better still, 3 or 4 ozs. of olive oil which one lets run in slowly and holds as long as possible. If the cause of the constipation lies in the upper parts of the intestine, then a suitable softening or regulating specific, to be taken not once, but daily, must be ordered by the doctor. Liquid paraffin is particularly good as a rule, especially if the cause of the constipation lies in the terminal section of the intestine. In most cases, however, one can achieve without trouble the lasting success desired by a diet containing a plentiful supply of fruit.

The bladder, too, often gives trouble in the first as well as in the last months of pregnancy, though it is hardly really more than discomfort. Owing to the pressure of the uterus on the bladder, frequency of micturition arises.

Likewise, owing to the increased demands made on the kidneys, injury may occur which may be dangerous both for mother and child. This is easy to diagnose owing to the secretion of albumen in the urine. We therefore put special value on regular examinations of the urine. The secretion of albumen may be of a relatively harmless nature; it may also signify the first warning signs of the most dreaded complication, eclampsia. In any case, as soon as there is evidence of albumen in the urine, measures must be taken to relieve the damage to the kidneys, and, if occasion should arise, to clear up further symptoms which have already appeared. By complete rest in bed and by non-stimulating diet with little salt, in worse cases without salt, it is generally possible with timely diagnosis to avoid serious developments. In difficult cases and as an exception, artificial delivery



may be necessary in the interests of mother and child. It should be taken as a rule that wherever difficulties of this kind crop up or are to be expected, the delivery shall be done in a hospital.

It goes without saying that every malady of the mother should be carefully treated not only in her own interests, but also in the interests of the child, for the disturbances of the normal functions which arise during an illness, as well as the formation of poisonous matter which takes place in the maternal organism, may injure the embryo considerably. Hence no illness during pregnancy should be taken lightly or neglected.

What is true of the poisonous matter formed in the body itself is, naturally, more than ever true in regard to the poisons which are introduced to it from without. They pass, as a rule, to the embryo and may temporarily or permanently damage it. The pregnant woman should therefore avoid all poisons as far as possible not only for her own benefit, but above all in the interests of the child. I have already fully discussed above the so-called toxins, and need not repeat here what was stated there. Only let it be emphasised that those poisons and harmful influences which we have learnt to know as injurious to the germ may, as a rule, also damage the further developed embryo, so that the woman has to guard against them during pregnancy just as much as during the preparation for procreation.

In the first place, the necessity for avoiding any effect of so-called occupational poisons, such as iodine, lead, mercury, arsenic, bisulphide of carbon, nicotine (workers in tobacco factories) and various others, must be considered. Likewise, the pregnant woman should not, particularly with regard to the child, be exposed to the action of X-rays (woman doctor, nurse assistant) or of certain radio-active substances (making luminous watches). It is the business of social hygiene to prevent injuries of this kind. In many countries, laws regarding this have come into force.

Most of the poisons which women absorb voluntarily are less virulent in their effect. Among these nicotine is again the first to be mentioned ; and what was said with regard to



smoking in the preceding chapter is to be borne in mind. Fortunately, in most cases, it is not difficult for women to give up cigarettes during pregnancy, since, in the first months of pregnancy as a rule, a marked repugnance to tobacco sets in even in the most confirmed smokers, but this unfortunately—for many a woman has hoped she had overcome her passion—can after the end of the period of lactation give place to a fresh craving.

As to how far the regular or occasional taking of small quantities of alcohol which do not lead to conditions of intoxication can have a harmful effect in pregnancy, opinion is still very much divided. In deciding this question, we must not forget that alcohol in various forms has been a luxury used by our forefathers for centuries; and we thus may consider it wrong to forbid the expectant mother, who has already many inconveniences into the bargain, a comparatively harmless desire. However, it must be borne in mind that alcohol increases still more the great demands made on the kidneys, and that this is particularly the case when it is taken in certain forms such as whisky, cocktails, etc. Hence, I would like to see the concession, which, moreover, must only be granted to the perfectly healthy pregnant woman, limited to an occasional glass of wine or beer.

On the actual narcotic poisons and the more serious soporifics, we need not waste any words. Everybody will understand without further discussion that they are forbidden at this time more than any other.

Moreover, not only decided poisons, but medicines also, which we take customarily, such as aspirin, for example, may have an influence on the developing embryo and may happen to harm it. Therefore it is to be regarded as a rule, that no medicines are to be taken without previous consultation with the doctor.

It would be going too far were I here to go into every single malady which may have a direct or indirect influence on the unborn child. I have already stressed above in general the importance for the child of an illness in the expectant mother; and we shall dwell more on the subject when in the discussion of the hygiene of pregnancy (Chapter



VII) we turn our attention to the mother herself. Whilst we must say on the one hand that every illness of the mother may exercise a harmful influence, on the other hand, we can state for their consolation that during pregnancy women possess a certain peculiar immunity, a stronger power of resistance to disease than usual; that is to say, nature of itself provides for the protection of the unborn child and therefore we need not be too anxious.

One question to which sufficient attention is not given, either in scientific literature or in medical practice and yet which seems to me to be of great importance, I would like to discuss here briefly in conclusion. It is whether it is possible to treat by way of the mother an unborn child in which the doctor for some reason suspects general weakness.

It goes without saying that here is not meant the case in which the "weakness" has a specific cause, such as syphilis. There the treatment should above all correspond to the specificity of the cause. I have in mind rather that in which the symptoms of general physical weakness in the family, or relatives, explain the apprehension that the new-born child will also be afflicted with them, an apprehension which seems especially justified if its preceding brothers and sisters have come into the world in a feeble condition.

Naturally the doctor will treat a weak mother suitably and thus presumably also influence the offspring favourably. By what means, however, can we specially aim at the child? The answer to this question unfortunately must be that such means are not yet known to us. I have already mentioned in Chapter I a few methods of treatment of this kind which, moreover, aim not only at the improvement of supposed conditions of weakness, but also strive for the prevention of disturbances in the development of the child due to hereditary causes. The details of these methods cannot be discussed here. That is a purely medical concern. It may be called to mind, however, that it is particularly homœopathic doctors who put value on the treatment of the constitution of the unborn child by way of the mother, and are convinced of its good results. I also consider it possible and even probable that likewise with methods of treatment



of a different kind—such as those recommended by *Aschner* for constitutional therapy, favourable results may be obtained ; although, of course, the *proofs* of the favourable effect in the very cases involved here cannot be given, because one can never tell how the child which is born would have been constituted without the previous treatment of the mother. Now, further methods for the treatment of general physical debility, and increasing the body's power of resistance to injurious influences from within and without, have recently been brought into use ; and these seem to me likewise suitable for the purpose in prospect here. In this I have in mind particularly the method of treatment of the Venetian doctor, *Protti*, who, by means of a sterilised syringe, takes 1 to 2 ccs. of blood from a vein of a young man, healthy and strong in every respect, and injects this without further ceremony into a muscle of the patient under treatment. In this, *Protti* proceeds from the idea that the cellular radiation discovered by *Gurwitsch* is of decisive importance for the operation of the blood thus conveyed ; and he therefore chooses as blood-givers young men in whose blood the presence of a strong power of radiation of this kind has been proved by the biological test (with yeast cultures). Now, whether the explanation of the mode of action of his blood inoculations—*Protti* speaks of inoculations, not of injections of blood—is valid or not the *effect* itself seems to me unquestionable. I have been able to see for myself on the spot that the slight interference produces no unpleasant accompanying symptoms or consequences at all. Moreover, patients of the most varied kind appear completely satisfied with the subjective result. With regard to the objectively perceptible effects, the periodical, *Radiobiologia*, published in Venice, contains very remarkable information. In numbers of pregnant women and babies, the harmlessness of the treatment has likewise been shown. On these grounds, in my opinion, the said method of treatment can be taken into consideration also for the purpose in view here. Whether in this case the blood of young men is to be used, or in consideration of the peculiarity of the pregnant organism the blood of women or pregnant women should be



preferred, for the present, one can only try to get an answer to this question theoretically. In this, two main considerations come into the foreground: the strong power of radiation of the blood of robust young men and the relative constancy of its hormone content, contrasted with the varying action of the hormones in women generally, and the presence besides of a great deal of waste products of metabolism and of special hormones (*e.g.*, of the placenta) in the blood of pregnant women. These considerations seem to me to tell in favour of the use of the blood of young men rather than of women, if we are to try to influence favourably the (supposed) delicate child in the uterus—an opinion which, according to information by letter, is shared by *Protti*.

After the previous discussion of the care of the physical health of the unborn child, now let us turn to the realm of psychological qualities and psychological influences.

One of the great riddles which has occupied mankind from time immemorial is whether and how far we can, by psychological means, influence the growing child in the womb physically and psychologically. Science can bring forward no evidence either for or against the many theories regarding this; popular opinion affirms the possibility, as we know from the widespread belief in maternal impressions. We ourselves, however, have seen and experienced too many inexplicable things to be able definitely to reject the problem as non-existent. We must admit that there really is a problem here, and must try to find our way in it so that we do not feel ourselves in conflict with existing scientific facts, and yet do justice to the possibilities which are open to us. In the last decades, we have often had the experience that there is a grain of truth in old popular beliefs: only one has to be able to sift it, and take pains to separate the wheat from the chaff. We must not reject in advance but rather examine and draw the community into co-operation.

The problem falls into two parts. On the one hand, the question crops up how far we can influence the child in its *psychical* qualities; on the other hand, we have to consider whether a *physical* influence on it in the uterus by violent



experiences of the expectant mother is possible. We are going to frame a hypothesis, derive a theory from it, and try to prove it so far that confirming it will be a matter of research. The two parts of our problem we must consider separately: let us start from the psychical and try to get from it an explanation for the physical processes.

Let us just leave aside the connection between mother and child. Each of us has had at some time the experience of thought-transference. Thought-transference—telepathy—is nowadays regarded as proved scientific fact, whilst comparatively a few years ago it was still rejected as superstition and not provable. A few isolated men of courage, engaged in serious experimental research, proved that there is actually telepathy. The first movement for the investigation of this problem began in England, where, in the year 1882, a society was formed for the investigation "of certain obscure phenomena including those which are commonly called psychic, mesmeric or spiritualistic." To it belonged English scientists of renown who, in various subsidiary groups and committees, had to investigate various partial problems. *Barrett*, the Dublin physicist, and other reputable men of learning were members of the committee for telepathy. Very careful and cautious experiments were made which, for the first time, established scientifically the fact of thought-transference, and thus gave rise to further research. It took further years of conflict to clear up the question of telepathy. To-day the majority of medical men are convinced of both these phenomena.

The great difficulty in all questions which apply to the human mind, both conscious and subconscious, consists in this, that the result of experiments in this domain is dependent on incalculable factors. Now—to take an example from the medical world—if one adds acetic acid to urine containing albumen, in boiling it one will always get a deposit, but if one gets into the thoughts of another human being, one will only very rarely get an answer to the question asked in the thoughts. In this, concentration, the momentary humour, mental agreement and so many other things besides are more decisive. With physical reactions, con-



vincing experiments can be made : the effect of a medicine can be proved readily, although even there differences in the conditions of the experiment may produce different results ; but in order to experiment with the human mind much more is required. The most important requirement is perhaps a very great capacity for concentration, which by far the majority of modern human beings possess only in a slight degree. Hence, to start with, we have to reckon with the fact that a great percentage of all experiments of this kind must prove unsuccessful. Also, one cannot absolutely recommend the reader to try to prove telepathy by his own experiments, although I believe that most people are vaguely conscious of this phenomenon.

Besides telepathy, which means the transference of the contents of the mind from one individual to another, we also know the phenomena of clairvoyance and thought-reading. This latter ability, thought-reading, is to-day often included with the " transference of the contents of the mind " in the concept telepathy, as we shall continue to do here. It is different with clairvoyance. Personally, I am firmly convinced that there are people who have the capacity for clairvoyance ; indeed, I go beyond this and believe that, under certain conditions, almost every individual might experience the " enlightenment " of clairvoyance. However, here it really is a question of a phenomenon, a " vision," which, in common with all other " visions," has the quality of rarity—rarity, not only as regards the number of people who share this experience, but also as regards the frequency with which the individual among these rare beings has the experience. Exceptions prove the rule in this case too, but when we see the number of those, particularly in big towns, who seek to earn their living by " clairvoyance," then a horror of the want of discrimination of these prophets and their victims takes hold of those accustomed to consider such things seriously.

Let us return to telepathy, however. The thought-influence which people who live in close contact exercise on each other can, I believe, scarcely be estimated highly enough. Consider, for example, how depression of spirits



in one member of a household can affect the others. Without the father—in most families the father is the member of the family most heavily burdened with worries—giving any expression in words to his vexation about an occurrence in his professional life or in business matters, his whole family feels an oppression ; a gloomy mood prevails in the family in spite of everybody taking the greatest pains not to appear to notice it. And without anyone knowing why, one member or other of the family, without any reason and in any case unintentionally, begins to speak of something connected with that occurrence. It “ was in the air.”

Although in a family of adults, each of whom has his own personal interests and follows his own profession, such transference of thought takes place, how much easier to understand—and how much more convincing as well—is such transference of thought from mother to child. In particular, those observations in which the thoughts aroused in the mother by her reading pass into the dreams of the child sleeping beside her (in one case, to twin sleeping children) may engage our interest here. For from there to the assumption of the possibility of a thought-transference from the mother to the child she is carrying in her womb is not a very long step. If we regard the phenomenon of thought-transference as a fact at all—and that it is so we have assumed as a working hypothesis—then the thoughts and mental processes of the mother, especially in the last months and weeks of pregnancy, must be able to exercise a strong influence on the unborn child, and consequently it is the most profound moral duty of every mother to adapt herself to this possibility.

Let us consider the following : a great deal can be explained by inheritance, but let us just assume here that the scientists who reject the possibility of transmission of acquired characters are right, whilst yet we nevertheless continually find that even individual knowledge is apparently transmitted in the blood. Then we can scarcely have inherited it ! But might it not be that we get many things by thought-transference from the father and especially from the mother ?

I mean by this not such things as can easily be explained



by actual inheritance such as, *e.g.*, musical or scientific talent, but the knowledge about things which the parents know, with which too they are much occupied, without, to their knowledge, having told or passed them on to their children. Having manual skill, the ability to make work easier by certain manipulations, the same lines of thought as the father, as well as similarity in movements, is this inheritance, or can we trace it to telepathic-transference? How does a lawyer's daughter who has never studied law know with absolute certainty things which another acquires with laborious study? To be sure—talent and the predisposition to a profession can be inherited, but still it is a fact that the son who takes up the same profession as his father finds his way in it more easily, knows many things more thoroughly, than the young man from a different milieu, although he (the son) has not grown up constantly in his parents' household; that is to say, could not learn the profession by looking on. Whence does the little child know exactly about its mother's linen cupboard if not by thought-transference? Later, many a mother is surprised that the child can no longer help so well, and no longer has such precise knowledge. It has forgotten much of what was unconsciously taken in, as it detached itself outwardly and mentally from the mother and began to go its own way, when school and playmates began to have an influence on its mind.

Nevertheless, a great deal is retained of what was absorbed unconsciously; and it is certainly worth while to make the attempt to influence one's unborn child by thoughts.

It is generally assumed as a fact that women are particularly susceptible to psychical impressions during pregnancy, and that they can be more easily and more strongly swayed by external influences than usual. Body and mind are absorbed by the task of creating, of constructing, and everything unfamiliar which comes near a woman in this period will necessarily leave traces not only in her own mind but also in the growing mind of the child. All the mother takes of food and drink, medicines and poisons from such things as tobacco and alcohol, exercises an influence on the child's body; then does it not seem, following a law



of logic, that likewise the psychical fare exercises an influence on the mind of the unborn child? To be sure, we cannot prove this, but there are many things between heaven and earth which we cannot prove—are they therefore less true?

As with so many things for which we cannot give reasons, but instinctively feel to be right, it is certainly better to regard also the possibility of telepathic thought-transference by means of the parents and environment—on the by-path *via* the mother—as probable till there is proof to the contrary and to direct one's course accordingly. In adhering to this theory, we shall certainly not take a wrong path, but may preserve the mother, and probably the child too, from much trouble and deep affliction; may give it, on the other hand, perhaps a big plus for life. In any case, it is also to be borne in mind that the mental peace, the happy, confident frame of mind, the bright reading, the pleasant diversion, the cultivation of which we shall recommend in Chapter VII in the interests of the mother, may likewise act favourably on the child.

Even the Ancient Greeks took for granted the possibility of influencing the embryo physically through the mental life of the mother, and acted accordingly. They endeavoured to stimulate the expectant mother to bear beautiful children by looking at beautiful sculptures and statues. If, at the present-day, we look at the works of art which have been handed down to us from the Ancient Greek civilisation, and read the description of the physical structure and the nature of the Ancient Greeks, we have to say: the result has proved them right.

Maternal "shock" in the banal sense we can in all probability relegate to the realm of fable. At any rate, it has never yet become scientifically admissible that children should bear on them the traces of a maternal fright in the form of birth-marks and other malformations, for, when further investigation is made, almost always similar phenomena are to be found within the same family. Evidence of the hereditary tendency to such things will in future be still better brought forward than hitherto, since, with the growing interest in questions of heredity in the whole world



and in all classes of the population, more attention will be directed even to apparently unimportant phenomena. We cannot, however, prove at present that unpleasant experiences of the mother can exercise any influence on the embryo. Only let it be borne in mind how, with a sudden fright, all the blood withdraws from the head and a swoon takes place or is threatened. How, in other people, face and neck are flooded with hot flaming red by an involuntary contraction of the blood vessels. Disturbances of circulation of this kind—for this is what is involved here—must also be able to exercise an influence on the circulation of the child, which is in the closest connection with the mother. Psycho-analysis has been to some extent occupied in recent years in analysing prenatal impressions and explaining from them the defective reactions of adults. Although personally I am of opinion that people go too far in this extension of psycho-analytical methods, yet I have to recognise the idea at the root of these considerations to be quite admissible.

If we try to get an idea in what ways the processes which take place in the mother may encroach on the growing child, then influence by change—sudden change as well—in the secretion activity of certain ductless glands is not the last to be considered. Although we have not yet much knowledge of such changes, yet the connection between shock and fear, sudden change in the adrenalin content of the blood (adrenalin is one of the very valuable hormones supplied to the blood by the suprarenal capsules), and the state of contraction of the small blood vessels is known to us. We know further that a constant exchange of matter between the maternal blood and that of the child takes place. And, therefore, we can very well imagine that in this way the child feels the reaction of what occurs in the mother.

Another possible way of influencing the child by changes which are produced as a result of the action of organic products in the mother's body—or are produced even earlier—we see when the female body absorbs substances in sexual intercourse which are contained in the semen of the male. These substances are absorbed by the vaginal walls, and



pass on into the woman's blood (absorption of semen). If the woman is pregnant then, as has been proved, a stronger absorption of the substances introduced into the vagina takes place. On the other hand, it is clear that the substances absorbed into the mother's blood may pass into the child's circulation, and thus have an influence on its body. Since the sperminum, a chemical compound contained in the semen (which can also be produced outside the body by a chemical process), has a favourable invigorating effect on the organism, the influence of the absorption of semen may be favourable to both mother and child. It is probable, however, that the action of the seminal substances absorbed into the blood goes beyond this, in the sense that both mother and child are, so to speak, impregnated by the paternal substances in a way which we do not yet know. If these substances come from the actual father, then their influence on the growing child can only be strengthened; and this influence must, as a rule, be recognised as desirable—an idea which, in my opinion, wrongly, is not taken into consideration when it is a question of counterbalancing the advantages and disadvantages of sexual intercourse during pregnancy. At the same time, however, it is clear from this idea that a still greater significance must be attached to intercourse with a man other than the father during pregnancy than has already been done from generally valid considerations.

This question, however, proves still more significant when we reflect that there are many facts which suggest that the absorption of seminal substances, and the impregnation of the woman with these substances, has a far more lasting effect than is commonly thought.

A particularly interesting point crops up here, which has been often considered in zoology, but is for the most part entirely ignored in human life. This is the question as to how far offspring can be influenced by a previous mate. Breeders of animals declare—and they cannot be diverted from this opinion by assurances to the contrary—that a female once covered by an inferior partner may, in consequence of this, at times bring inferior young into the world



later as well and, therefore, has to be debarred from breeding. Whether and how far such an occurrence can be assumed in human beings I leave undecided: I would not reject the possibility. For I know of an instance which makes me take this possibility into account, and in any case gives me cause to warn women for this reason also against premarital sexual relationships.

A young healthy woman of a hereditarily healthy family was first married to a man who, after a few months, died of a malady the nature of which was not quite cleared up. Of this marriage, she bore a son who, even as a child, was rather weak-minded and afflicted with goitre, and when grown up proved absolutely unfit for the battle of life. This woman, now aged seventy, still healthy and fit, married two years after the death of her first husband a thoroughly healthy man as little tainted hereditarily as she. Neither of them comes from a goitrous locality nor did they settle in such a locality. Of this second marriage, there are four sons, the three elder of whom all have goitre, and, although they cannot be said to be weak-minded, yet they must be regarded as greatly inferior as far as their intelligence is concerned, whilst the youngest is quite normal. Fortunately, no moral weakness exists in any of them. A farmer who is a friend of the family first raised the question whether the same rule might not hold good as is known to the breeder in the animal kingdom. At any rate, this case has made the doctors of the family think.

Romantic literature, too, has seized on this question. In the novel by *Robert Hitchens*, "Lady Brandon's First Husband," it is treated in a very interesting manner. The heroine is unhappy and childless in her first marriage, which lasts for seven years, but then finds full satisfaction and happiness in her second marriage. A son is born of this second marriage who, the older he gets, the more strongly he shows all the doubtful psychical qualities of the first husband, while, in outward appearance, he resembles his father, Lady Brandon's second husband.

How complicated these things are is clear from another interesting case in which, not a preceding physical union,



but a strong psychical influence, which set in during pregnancy, had an effect on the child. The case is as follows :

A woman was made pregnant by her husband against her express wish, and, in consequence of this, a heavy depression developed in her. In this state, in the third month of pregnancy, she got to know a man for whom she felt strong sympathy, which quickly deepened to such an extent that her whole mental and sentient life was entirely centred on him. He, too, felt himself more and more strongly drawn to her. They saw each other a great deal and he did all he could to help her to overcome the depression. In the end, this was to a great extent successful. Love was never mentioned, and the idea of physical relations in these circumstances did not come into question at all.

The child—a girl—was born. As a result of an illness occurring, the mother was unable to feed it herself and had to leave the whole care to a nurse. After the woman's recovery, the psychical intellectual relations with her friend was resumed : they developed into love, divorce took place, and wife and friend went far away and married. The child remained with the father ; he too married again and a very happy family relationship resulted which, for special reasons, was not influenced by any communication between mother and daughter.

Then fate led the grown-up daughter to her mother and the latter's husband. Between him and the child there quickly developed, from a mutual liking at first sight, a marked confidential relationship, in spite of the fact that the girl had, as may be understood, every reason to have an antipathy to a man who had brought trouble into her life. The most remarkable part, however, was that the child not only showed a congenital peculiarity of physique which strongly suggested a physical (acquired) defect existing in the man, but also had various qualities of character which were similar to his, and which gave rise to the impression that a mental, psychical kinship existed which might be called an incorporeal paternity.

Was this evidence of a telepathic influence—for we have returned to this subject with this case—on the child develop-



ing in the womb? It might have been thought possible to produce it, if the agreement of significant qualities of character had been proved by a comparative graphological examination. This attempt proved futile; the well-known graphologist *Robert Sandek*, to whom the handwritings were submitted, could not get the impression of striking agreement from them. It appears, however, from his answer to a question regarding this that a positive result was scarcely to be expected. For the most part, marked agreement of graphological peculiarities cannot even be shown between parents and children, or between twins otherwise wholly similar to each other. In general, there is nothing definite yet known in this domain. Now and again, the handwritings of members of a particular famous family outstanding in art or science are examined, but nothing has resulted which could convince the real expert.

However that may be, the question: "Proofs?" in a case like that just sketched must be answered by "No." Nevertheless, such a case makes the unprejudiced observer think.

I believe we have before us in the foregoing a problem, or rather a series of problems, which may be of vital interest for the happiness of every single family; therefore women should reflect with very special care on the question of pre-marital connections as well as that of connections during pregnancy; for in some circumstances, offspring appear to be influenced in an incalculable way. That such an influence may also operate in a biologically favourable sense, I am willing to admit. (There are writers who deduce from this a justification of the *jus primi noctis* and similar institutions—*se non è vero, è ben trovato!*) However, even a biologically favourable influence may, in the circumstances which result from our social structure, prove to be a fatal influence as far as marriage and the family are concerned. This should not be forgotten.

From all that has been said, we have seen that—apart from the hereditary influences—the influence of the mother on her unborn child does not begin at the moment of con-



ception only, but that conduct and actions which are a long way back may be of importance in this way.

It is therefore important to educate the children growing up in responsibility to, and in ideas about, the coming generation. Boys should be directed in the most healthy mode of life possible, and warned betimes of the consequences of drunkenness and of sexual excess. Especial value, however, should be put on the education and physical care of girls. Proper food rich in vitamins, plenty of sun and air and sensibly conducted and regulated gymnastics from infancy will contribute to developing the body properly, and avoiding malformations of the pelvis such as occur in rickets. And bringing home to the adult young woman the idea that the significance of sexual intercourse may extend far beyond the moment for herself, and be decisive for her children, will be not less important for training first-rate mothers physically and psychically.

#### A FEW WORKS RELATIVE TO CHAPTER III

- C. W. HUFELAND (1762-1836). "Von der Krankheiten der Umgeboren, etc.", Berlin, 1827. (*Aus. dem. Journ. d. pract. Heilkunde*) zit; *Theorie und Praxis in der Medizin*, 1934.
- DURAND-WEVER. "Die Verhütung der Schwangerschaft," Antäus Verlag.
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- V. NOORDEN. "Die Fettleibigkeit." Safari Verlag, Berlin.



## CHAPTER IV

### PRECAUTIONS AGAINST INJURIES OF THE CHILD AT BIRTH. NATAL HYGIENE. HOW DOES THE CHILD COME INTO THE WORLD WITHOUT INJURIES ?

BIRTH is the separation of two organisms which have, till then, formed a unit. It proceeds with a great expenditure of forces, the most marked of which are the contractions of the uterus, the labour pains. The number and strength of the pains, naturally, depend on the extent of the resistance to be overcome. Their effects may be disadvantageous both for the woman giving birth and the child being born ; and we propose giving here those helpful expedients which reduce to a minimum the risk to the child.

A little reflection shows that during delivery the interests of the two participants—mother and child—may easily be brought into opposition to one another. It is bound to be to the interest of the mother to force as small a child as possible into the world outside, for then the labour pains are less. For the child, however, it is advantageous to be born as mature and capable of resistance to disease as possible, and to be able to meet the shock, that the change of surroundings brings, in a fit condition and in possession of as great a reserve of strength as possible. The bridging of these, to a certain extent opposite interests, often makes the greatest demands on the obstetrician's skill ; it is, at the same time, a test of obstetric ability in general. The old midwifery almost always acted on the dictum that, if necessary, the child should be sacrificed to the mother. This point of view cannot be abandoned altogether even in modern midwifery. It must, however, be emphasised that, in consequence of our extended knowledge and the improvement in technique, the sacrifice of the child's life by the gynæcologist has become more and more of a rarity. Thus *Sellheim* was able to express



himself with pride to the effect that the ideal aim of midwifery had almost been attained: making it possible to carry to full time the child conceived, bringing the full-time child into the world alive, and keeping it alive when born.

The difficulties which stand in the way of the unimpeded birth of the child proceed from the generative canal and from the child. It is plain that the narrowness of the former may retard and even obstruct the expulsion of the child. The bony resistance which, in certain cases, is presented by the pelvis may be so considerable after certain illnesses that the passage of the child is either not possible at all or only after changing the shape of the head. Obstruction, too, may be caused by the soft parts, the deficient dilatibility of which—as a result of age, past illness or previous difficult labours—may make the passage of the child difficult.

Further, there are various illnesses or abnormalities of the mother which have an unfavourable influence on the process of labour: general debility, under-development of the sexual apparatus, swellings of the generative canal, changes in presentation, excessive pendulous belly, etc. Likewise, certain disturbances in the course of the pregnancy itself may be the cause of delivery being obstructed or endangered: I may mention among others prolapse of the placenta and eclampsia.

Finally, for the sake of completeness, may be added to the list, though rare, affections of the brain and spinal cord, the effects of which may influence the process of delivery disadvantageously.

The difficulties proceeding from the child may be due to abnormal size or by (fortunately very rare) malformations. But not infrequently it is the irregular presentation of the child which causes interference with delivery. Multiple pregnancies may in both ways lead to disturbances in the process of labour, and thereby may endanger the child being delivered.

Of all these difficulties which endanger the child—and often the mother as well—the abnormal presentations are



of greatest importance. This is due both to the relative frequency of their occurrence and to the ease with which, as a rule, they can be avoided. It is necessary to give the mother a certain idea of these things so that she may grasp their importance and follow the advice to submit to medical control. By doing so, she will save herself and the child from the dangers associated with these abnormalities.

By presentation is meant the relation of the longitudinal axes of the uterus and of the child to one another : hence we speak of longitudinal presentations when the axes are parallel to one another and of transverse or oblique presentations when they form an angle with one another. In longitudinal presentations, we differentiate according to the presenting lowest part of the child, head presentations and pelvic presentations. The attitude denotes the relations between the individual parts of the child's body to one another : in the occipital attitude, the head is bent forward, the chin pressed against the breast : if it is extended, then it is a question of a frontal or face attitude. With the pelvis presenting, a breech, knee or foot attitude may exist. In mentioning these differentiations, it may be observed that in practice, presentation and attitude are not kept strictly separated, so that we generally speak of occipital presentation, face presentation, breech presentations, etc.

Normal birth is that in the occipital presentation (occipital attitude), that is, a longitudinal presentation in which the child's occiput is lowest and is born first. It is the most favourable both for mother and child. We are going to describe a birth of this kind, and then review the most common deviations from the normal, treating them here exclusively with regard to the interests of the child.

The act of delivery can be divided into three parts : the period of dilatation, the period of expulsion and the after-birth period. In the first period, the uterine occlusion towards the vagina is made passable. The dilatation of the uterus is done by the action of its muscles, which is assisted by the pressure of the amniotic sac. In the period of expulsion, there comes into activity, in addition, the force of the



abdominal muscles, which helps to push the child forward through the pelvis and along the pelvic floor towards the outside. With the emergence of the child's body, the second period is finished. (The description of the third stage, the after-birth period, is reserved for a special chapter.)

Regular contractions of the uterus recurring at not too long intervals, which need not be painful at first and have as their object the dilatation of the uterine cervix, indicate the beginning of labour. After some time, they become more frequent, the pauses between two pains shorter, and sensation goes from the lumbar to the pelvic region, being now felt most strongly in the sacrum. During the pains, a hand placed on the abdomen feels the uterus becoming harder; indeed, it hardens so that in a thin person its outline can easily be seen through the abdominal walls. During each pain, the water in the amniotic sac is pressed towards the os uteri, which is enlarged in this way by a soft yet energetic pressure. When the os uteri is entirely obliterated, the amniotic sac, which has pressed between the presenting part of the child (in normal cases, the head with the occiput presenting) and the wall of the cervix, has fulfilled its task; it bursts, and now the child's skull comes into contact with the vagina. Till then, the amniotic sac has had a second important task as well: the protection of the presenting head, which, as a result of its intervention, is not directly exposed to the pressure of the labour pains. After the amniotic sac has burst, if delivery does not proceed quickly, there arises on that presenting part of the child which is spared from the direct pressure of the uterus, the caput succedaneum—an accumulation of fluid in the various layers of the scalp, which disappears soon after birth.

A short pause in the pains often follows the bursting of the amniotic sac, and the passing of the bag of water; the uterus has to compensate by contraction for the diminution of its contents in order to be able to work with fresh force at the expulsion of its contents. After the period of dilatation comes the period of expulsion, the abdominal muscles are set in action, the uterus by contraction upwards has forwarded a portion of its contents, the child's body, into



the lower genital passage. There the child's head meets a resistance in the pelvic floor so that it must adapt the shape of the skull to the genital passage ; the bones of the head, if they have not already done so, push against and over one another ; and, if the passage through lasts rather a long time, the *caput succedaneum* previously mentioned is enlarged. The occiput conforming to the curvature of the generative canal presents towards the pelvic symphysis, and the head rotates and arches the pelvic floor in front of it, so that a bulging downwards can be observed externally. Now a small section of the head appears between the labia. At each successive pain, a bigger section is pressed forward, but at first it recedes again altogether in the interval between pains. After a few more pains, it remains visible in the interval also. A few more pains—there need only be a few, though with *primiparæ* the process may be further protracted—and the head by violent adaptation to the external genitals comes through. Shortly after it is quite delivered, that is, it has emerged from the vaginal orifice. The delivery of the head is followed after a short interval in the pains by that of the shoulders : these, too, stretch the perineum, although to a slighter extent than the skull. The expulsion of the rest of the child's body presents no further difficulties.

This brief description of normal birth will, no doubt, make every reader realise that during delivery, owing to the pressure exerted, and as a result of the resistance made to expulsion, the child is exposed to a considerable stress, which may even become a danger if the pressure is too great, or too protracted, or the resistance too violent. But if this is so when delivery takes place normally with a head presentation, in which the pressure acts on the child in a way least burdensome to it, then how much greater must the dangers be to which the child is exposed when the delivery is other than this presentation ? This, too, everybody will understand. Fortunately, I am able to add that these dangers can be avoided in the great majority of cases. Abnormal presentations and positions of the child can, in most cases, be diagnosed by the obstetrician in the last period of pregnancy



and can, as a rule, be changed without great difficulty to the normal presentation. Indeed, a number of unfavourable positions of the presenting part of the child can often be put right even at the beginning of delivery.

Two measures which I regard as the most important in natal hygiene, and therefore cannot urge too earnestly on my women readers, follow from what has been said : one is to call in the obstetrician or the midwife—at the very beginning of labour, so as to give him the opportunity of seeing that everything is in order ; and the second, better still, is to put themselves under obstetric guidance during the last months of pregnancy. This guidance is just as much to the interest of the mothers as to that of the children. It should include a survey of the mother's general health, and an examination of her renal function, the shape and size of the pelvis, the state of the genital organs and, finally, the position of the child. This guidance, particularly being concerned with the position of the child in the womb and the size of the pelvis, which makes possible the passage of the child, represents one of the most important measures in the hygiene of pregnancy.

It should not only be made possible but easy for every pregnant woman without exception to put herself under guidance of this kind. Where it cannot be done privately, town clinics or advisory bureaux for pregnant women should be instituted ; and suitable publicity should continually impress on women how exceedingly important it is both for themselves and for their children that they should make use of the opportunities provided for this guidance.

No country should hesitate over the expense of this propaganda and these advisory bureaux. Not only is it in its own best interests for any country to be able to incorporate the children into the nation alive and uninjured, but also it saves itself the far greater expense of public provision for mothers and children injured unnecessarily.

Let us now consider the dangers with which, in consequence



of the circumstances mentioned, a child is threatened even in normal delivery.

The skull, as the hardest and largest part of the child, is most exposed to strain by the act of delivery. Between the child being delivered and the genital passage there always exists a relative disproportion. The adaptation of the skull made necessary thereby consists in a slight displacement of the not yet quite hardened bones of the head which—especially the parietal bones and the tabular part of the occipital bone—overlap a little at the edges, but are also changed in their arch. The soft spaces between the skull bones permit of the contents being displaced to some extent and, in conformity with the varying conditions of space, to press forward here and there. Sometimes, however, damage to the brain may arise owing to this, especially when delivery is protracted. Pressure exerted on the surface of the skull may then be extended to the brain; and, if the pressure is too great or too long continued, may result in phenomena due to this pressure or even to hæmorrhage from the blood vessels on the cerebral surface or in the cerebral substance—a condition which may endanger the life of the child. That is to say, if a vital centre, *e.g.*, that of breathing or of the heart, is injured by hæmorrhage, then death takes place either during parturition or soon after. But if the injury affects another part of the brain, the functions performed by it may be impaired throughout life: many cases of blindness or deaf mutism, of paralysis, are perhaps to be explained in this way. Fortunately, however, we need not worry too much about the extent of these dangers. For, in the first place, the suggested consequences of the pressure exerted can, in most cases, be entirely eliminated by the restorative power of nature, and—what is of far greater importance—in normal delivery of a child, healthy in itself, they will not occur to any considerable degree. Hæmorrhages inside the skull in this case may be avoided and the slighter phenomena caused by pressure pass away quickly. Hence it is only a question of taking care, by the preventive measures set forth in the pertinent chapter of this book, that the child about to be born is healthy and the birth



takes a normal course. Regarded from this point of view, the whole preliminary care and precautions during pregnancy and even before pregnancy appertain also to natal hygiene.

The action of the child's heart, too, is affected by the act of delivery. This is likewise partly due to the pressure exerted on the skull and thereby on the brain of the child ; partly, however, it depends on other influences.

In the majority of babies, a slowing down of the heart-beats at each pain is observed ; and this the obstetrician must watch, as a long-continued slowing down indicates a risk to the child. The more quickly the pains succeed one another, the greater is the demand on the foetal heart, which, however, is compensated by the intervals between the pains : the heart has a few moments to recover. At the moment of birth, however, the whole of the child's circulation is essentially transposed. Till then, the exchange of gases, as well as the exchange of its building-up substances and waste products, takes place through the placenta. This method of supplying the child with the necessaries of life is impeded by labour while the pains last, and is wholly interrupted with the end of delivery. So long as the foetus gets sufficient oxygen from the mother, it does not breathe, but with the diminution of the oxygen contained in the blood from the mother an attempt at breathing is set in motion from the child's brain. This transposition normally takes place after the birth of the child. As the result of certain complications in delivery, however, the supply of oxygen from the placenta may be interrupted, and the child may consequently try to make respiratory movements too soon. If this happens while it is still inside the maternal organs, these respiratory movements will be useless for want of a supply of air, and will lead to the sucking in of mucus, blood and liquor amnii. The child is in danger of suffocation, which, if not relieved as quickly as possible, leads to death. With the expulsion of the child, however, so long as it has remained unharmed, the pulmonary respiration is set in motion, and at the same time the circulation of blood is wholly transposed.



After delivery, the child still remains for a short time connected with the placenta by the umbilical cord, and hence also with the mother. Immediately after the expulsion, the vessels contained in the cord still pulsate, a sign that exchange of blood with the placenta is still taking place. Most doctors are now of opinion that the severing of the umbilical cord should not take place till the visible and palpable pulsations in it cease, and the uterus has again contracted strongly and the child has uttered its first cry. Thus, a not inconsiderable quantity of blood (the so-called reserve blood) is received by or supplied to it—whichever way you take it—that is otherwise lost with the placenta. In the opinion of these physicians, however, this reserve blood is absolutely necessary to the child, as, owing to the expansion of the lungs, the area of flow of the circulation of the blood is considerably extended.

From the preceding description it is clear that even "normal" delivery represents a great strain on the child. Fortunately, ever-provident nature has taken the necessary precautions for protecting the foetus from these pressures.

The great friction to which the child has been exposed whilst making its way through the, to it, close-fitting genital passage, is considerably reduced or even eliminated by the mucus produced by the genital passage, by the liquor amnii and by a peculiar secretion of the foetal skin (sebum).

Then, while the amniotic sac, which "makes room" for the after-coming body by helping to dilate the genital passage, remains, the great pressure is distributed equally to all parts of the child. Even after the amniotic sac has burst, there is still, as a rule, in normal delivery enough liquor amnii left to effect an approximately equal distribution of the pressure.

The child's head, owing to the sutures and fontanelles (places where the sutures meet) between the bones remaining open, can, to a certain extent, equalise the very great disproportion between the head and genital passage in human beings in contrast with animals; it can, besides, be further



moulded temporarily to fit the passage, as its lamellæ of bone are really only very slightly hardened.

In spite of the great increase in pressure, the supply of blood, and with it of oxygen and nourishment to the fœtus, is actually never insufficient, as the amount of oxygen contained in the venous blood is enough to sustain the internal tissue respiration. Moreover, the umbilical cord is protected from the pressure of the fœtal body owing to its slight specific gravity, which permits it to float in the liquor amnii ; and its round shape and slipperiness make it easily avoid any harmful compression in spite of its vessels being rather superficial.

In abnormal circumstances, nevertheless, the natural protective measures do not suffice to guard the child against the dangers of delivery. In such situations, it is the business of the obstetrician to give help, to get the child out of its dangerous position—which, moreover, may often endanger the mother as well. The help given will mostly consist in hastening the end of delivery. Now and again, strengthening the labour pains will suffice for this ; but sometimes operative interference is necessary as well. We propose saying something about these interferences in the second part of this book. At this point, two obstetric operations only need be mentioned, as they are undertaken in certain cases to get the child away from the threatened danger.

The first of these operations is Cæsarean section, *sectio-cæsarea*, in which the child avoids the natural genital passage and is brought into the world by cutting open the abdomen and the uterus. Readers may be inclined to attach heroic significance to the name of this interference—"Cæsarean section"; and, indeed, in olden times when there was no narcosis, no asepsis and only a primitive technique of operation, this could really not be denied. But in these days this would not be right. The name, as many readers will be interested to hear, has a very commonplace origin : the word "*cæsarea*" does not come from "*Cæsar*," but, as *Pliny* asserts, from "*cæsum*," the participle of "*cædere*," which may be translated by "cut." The correctness of



this derivation is attested also by the fact that those born by this operation in Ancient Rome were called "Cæsones" (cut-outs). Since "sectio" also means "cut," "sectio cæsarea" is a pleonasm and "Cæsarean section" a wrong translation. These expressions, however, have been adopted and so we will keep to them, although there are correct names—but too technical for laymen—for this operation.

The most important indication for the operation, which can often be decided before the commencement of labour, is the confirmation of a significant disproportion between the pelvis and the foetal head. In great pelvic contraction, *e.g.*, as a result of rickets, a fairly well developed child will be able to pass through the genital passage only with difficulty, and accompanied by severe and protracted labour pains or else not at all; but an overdue or an unusually big child sometimes cannot be born in the natural way. For such cases, we have in Cæsarean section a possibility of delivery with comparatively little danger both for mother and child. Some well-known obstetricians have even recommended delivery by Cæsarean section for the majority of births as the favourite procedure, for, in their opinion, the operation is less dangerous for the mother than the natural delivery, while it spares the child the strain due to pressure by the labour pains and the genital canal, and is more likely to bring it into the world alive and sound.

Of course, this procedure is really necessary in certain cases, and we should choose this way particularly in certain illnesses of the mother so as to save her the strain of delivery. In the interests of the child, however, we should take this course only when, in our experience, it seems to be exposed to greater risks, either by waiting or by using some different method of interference rather than Cæsarean section. For we must not forget that the deep narcosis during this operation is detrimental to the child, and that the operation is attended with changes in the body of the mother which make her liable, in a later confinement in the natural way, to rupture of the uterus through the operation scar. Hence, though on the one hand special attention must be called to the fact that delivery by Cæsarean section, where abnormali-



ties in the normal course exist, may be regarded as the best way, in many cases, both for mother and child, and the dread which people used to have of this operation must give way to confidence in it, yet, on the other hand, it must be emphasised that any interference of this kind must, nevertheless, always be regarded as a serious undertaking, and should not lightly be put in place of the normal or approximately normal delivery.

Another possibility of bringing delivery to a rapid end, if it is a head presentation, is by the use of forceps. These will often save the child (its application for indications in the mother calling for treatment, we are not considering here), but they can also do a great deal of harm. The pressure which they necessarily exert on the child's head should decidedly not be regarded as of no importance. This may endanger the life of the child; it may also lead to injuries which become perceptible in later life. Therefore, the woman in labour should leave it to the obstetrician to decide whether this certainly often beneficial instrument is to be used, and not influence his decisions, which involve great responsibility, by urgently begging for the end of delivery by means of the so-called delivery forceps. Modern midwifery manifests the greatest reserve in the application of this instrument, even though it often saves life and is, in certain circumstances, indispensable. Fortunately, this conservatism is made considerably easier by the progress which medical treatment of protracted labour has made recently, particularly on hormonal lines.

Close observation of the foetal cardiac sounds during parturition—a procedure which women often find annoying—is for many reasons of the greatest importance. I mentioned that the pulsations of the foetal heart, which can be heard by putting a stethoscope on the abdomen of the pregnant woman, is slowed down by each pain, but that the normal number of about 120 beats to the minute is again reached shortly after the end of the pain. Now, if the frequency of the cardiac sounds remains for some time below 100, if the strength of the sound is also lessened in the interval between pains, then it must be assumed that there



is risk for the child—an assumption which is still more likely if afterwards the number of heart beats is accelerated considerably above the normal.

In this situation, it is a question of expediting delivery, because the prospect of bringing a living child into the world quickly grows less. In these circumstances, in cranial presentation with the head sufficiently low, the application of forceps is the prescribed procedure. In other presentations of the child, or if the preliminary conditions for operation with the forceps seem otherwise unfavourable, interference must be made in another way. As I have just indicated, however, the obstetrician of to-day has a number of drugs at his disposal, the effects of which in increasing the pains bring delivery to an end comparatively quickly in less urgent cases. Some of them make the application of the forceps superfluous (a medicinal substance of this kind has been characterised very aptly as forceps in the injection syringe). Its action can be graduated easily and accurately by the method of administration (injection by the mouth, or by under the skin, into the muscles, or into the blood channel). However, here, too, alternative courses must be considered; and experience must decide the choice and method of administration of the specific.

The apparent death of the new-born babe represents one of the commonest and most important complications of delivery. This manifests itself as absence or deficiency of respiration: the child does not cry, or only feebly. The causes of difficulty in breathing are mostly either after effects of the pressure exerted on the brain, and, in worse cases of this kind, injuries to the brain, or the drawing in of mucus, liquor amnii, or blood into the air passages. The colour of the baby's skin indicates the degree of the harm: the "blue" apparent death is the less serious; the "pale" far more critical. In the former, corresponding to the extent of the harm, the heart generally beats strongly, whilst, in the "pale" apparent death, the heart beat can often not be distinguished. In this situation, it is the duty of the obstetrician to try as quickly as possible to set the respiration going. Thus the sucked-in mucus, etc., must be removed



from the upper air passages, for which purpose, after the oral cavity has been wiped out with the finger covered with a bit of gauze, the child is held head downwards and the buttocks and the soles of the feet slapped (not too hard!) alternately. If this does not achieve the desired result, then a thin rubber tube (catheter) is inserted into the naso-pharynx and the trachea; and one sucks the obstructing substances (with the interposition of a glass bulb) with one's own mouth. Suction with the mouth is better than with a rubber ball, as with the mouth one can feel what one is doing.

Not till after the removal of the substances obstructing the breathing should attempts be made to set the respiratory movements going by mechanical means, or to replace them temporarily by passive movements. The old swinging (according to *Schulze*) was condemned by many because on the one hand it might increase an existing laceration of tissue which would perhaps heal up; on the other hand, it might drive sucked-up masses of mucus and blood further into the lungs, besides forcing the contents of the stomach (in being born almost every child swallows mucus and liquor amnii) into the lungs. In place of this procedure, there have been numerous others, *e.g.*, artificial respiration according to *Sylvester* (as it is used in cases of drowning). All the same, it must be confessed that they are not so effective as the old swinging method of *Schulze*. Apparatuses, large and small, have been constructed which move the diaphragm, in which case the heart is massaged at the same time. Unfortunately, these appliances can be used only in hospital, for their transport to private houses is very troublesome. I read recently an interesting idea of a doctor: he applies sheets of rubber as suction pads on to each side of the thorax (like those of leather with which in our youth we drew paving stones out of the plaster owing to the vacuum resulting from pulling) and uses these as a means of alternately expanding and compressing the thorax. The expedients mentioned must be assisted further by skin stimulation applied in the form of alternate baths—hot and cold—or sprinkling the child with cold water. In doing so, how-



ever, the child's body must never be made too cold; it should be protected by warm towels between the various processes. Anyone without much experience in this domain would do best, in my opinion, to let the child lie in his left hand in warm water, holding the neck with the thumb and little finger, and with the back of the head lying on the inner side of the forearm and with the right hand spread as much as possible over the thorax, compress this rhythmically about twenty to twenty-five times a minute. One must not lose courage too soon, but continue it for some time, interposing now and again the application of skin stimulation in the form of brief cold dips, taps on the buttocks, rubbing of the skin with the towel.

In the slighter cases of breathlessness, skin stimulation is sufficient. These cases are often met with when the expulsion period has lasted very long, and the umbilical cord, twisted round the neck, was at the same time being pressed upon. There is no need to worry in such cases if the child does not cry at once. In most cases, even a still slighter irritant, *e.g.*, pinching or nipping a fold of skin or the ear, is sufficient to evoke the first cry.

A worse appearance can be caused if the child is delivered by means of an operation in deep narcosis of the mother. We must not forget that it also gets a corresponding share of the narcotic. Sometimes, then, it is limp and pale after birth as if asphyxiated: the condition, however, is distinguishable from the real "pale breathlessness" by the comparatively good and strong heart beat.

In true cases of white asphyxia, in which, that is to say, not only the respiratory centre but also that of the heart has suffered severely, injections of drugs which stimulate the heart are employed. Unfortunately, however, these expedients in such serious cases only very rarely lead to success; and even then it is not always lasting, for the fate of apparently still-born babies is always uncertain in the first days of life: 25 per cent. soon succumb to the cause of their breathlessness and perish as a result of cerebral hæmorrhage. With every day, however, the prospects for the child's living improve.



As a conclusion to our remarks on resuscitation, private baptism should be mentioned. Every doctor, whether devout or not, whether Protestant or Catholic, if he finds himself faced with a child of Catholic parents which is in danger of its life before it has been baptised, is morally obliged to baptise it. He does this by sprinkling the child's head, preferably the forehead, with ordinary water and meanwhile utters the words : " I baptise thee in the name of the Father and of the Son and of the Holy Ghost."

The water should be plain water, that is, not a disinfectant solution ; it should, however, be boiled. The necessary quantity should be so measured that the water *flows* over the head.

If a child is in serious danger of its life, then the private baptism, in case not the head but perhaps another part, *e.g.*, a foot or a hand or the buttocks, is within reach, must take place by pouring water on that part whilst uttering the said sacred words. (In just such a case, for the sake of asepsis, freshly boiled water is of importance.) After the birth, should the child live, yet still hovers between life and death, the private baptism is to be repeated by now pouring water over the head (brow) and the baptiser saying the words : " If thou art not baptised, I baptise thee in the name of the Father and of the Son and of the Holy Ghost."

It seems to me imperative to speak also of the changes which the act of delivery leaves behind temporarily in the body of the new-born baby. Many a healthy child whose later growth progresses quite satisfactorily looks quite deformed immediately after birth. *Caput succedaneum* and skull configuration change the appearance of many children so much that they look like monsters ; and many obstetricians consider it advisable not to show sensitive mothers their children till the following day. The *caput succedaneum* is to be understood as a phenomenon of obstruction in which, in consequence of the difference in pressure between the part of the head still inside the uterus and that already in the vagina, a disproportion between the afflux and defluxion of the blood occurs which thickens the skin



and now and again leads to slight extravasations of blood in and under the skin. Also in the neighbourhood of the caput succedaneum there is slight congestion which likewise alters the skin though more slightly. In protracted delivery the caput succedaneum may reach a considerable degree and simulate deformity; often the skull of a new-born child looks somewhat like the top of a tower. All these changes are hardly noticeable even the day after birth; the rarer hæmorrhages also disappear completely after a few days.

The shifting of the skull bones towards each other (configuration) adds to the unnatural appearance of a head greatly compressed during delivery. The edges of the bones, as I have already said, are pushed under one another as a result of the pressure of the genital passage exerted on them, so that the skull looks polygonal. However, these alterations too are not permanent, disappearing in a few days.

The bright red of the whole body which occurs immediately after the first washing likewise subsides in a short time; only it generally fills the anxious mother with apprehension immediately after delivery.

The question whether the condition of the child cannot be so influenced that the danger of delivery is diminished may be considered from various angles. As we have already said, it has been proposed simply to avoid the danger by removing the child from the uterus by operation and thus eliminating the whole labour. This way must, however, be rejected as not practicable in normal cases, for reasons which I have explained above.

Strengthening the child during pregnancy so that it is as capable of resistance as possible is, of course, to be recommended. However, in doing so, such methods of strengthening should be chosen or sought as do not, at the same time, increase the size of the child.

Another possibility is to start labour artificially before the normal end of pregnancy. The child, then, because of its smaller size, meets with less resistance on its way through the genitals, and it has thus less to suffer in this respect.



The child, however, is, in its not quite mature condition, so much more easily injured and so much less capable of resistance to the harm affecting it, that the disadvantages of such a procedure far outweigh the advantages. The obstetrician can therefore proceed on this principle only in certain exceptional cases.

Thus, normally, nothing decisive should be done in either the one or the other of these directions ; and it may be said, moreover, that nothing need be done as the normal child gets through normal delivery without injury. It is only a question of shaping the preliminary conditions for labour in such a way that it can and will proceed naturally, and of getting and keeping the child in a condition which may be regarded as normal.

As regards this, however, we need not wait patiently to see how things develop. For we can endeavour to make the child healthy ; and we can strengthen as far as possible its capability of resistance to harmful factors. Furthermore, we can take care—and this I consider important—not to let the child become “supernormal.” I mean by that, extending obstetric control to the whole duration of pregnancy and hence increasing the size of the child. This seems to me all the more necessary, as with the greater care of pregnant women, on which we must absolutely insist, the prospect of an extra length of pregnancy increases. On the other hand, I consider it useful, by careful supervision of the diet of pregnant women, to see not that the child remain abnormally small—for it should not do so and, besides, nature would oppose any such intention—but that it does not become bigger than it need be naturally ; and I aim at such a constitution of its body that it can adapt itself as easily as possible to the demands of configuration made by parturition. I have discussed this in the preceding chapter, but would like to refer again here to the necessity for the individualisation of such expedients as are practical. In this the woman should not act on her own responsibility, but leave the decision to the doctor. And in what he prescribes he will keep in mind the interests both of the child *and* of the mother.



If I were to extend this chapter, then all the disturbances and deviations of the normal course of labour which can endanger the child would now have to be discussed. I do not wish to do this because I should then have to review the whole of midwifery. I make only one exception : delivery in the pelvic presentation, *i.e.*, delivery in which the child presents in such a way that its head is born not first but last. The danger of suffocation in this case, if the expulsion does not proceed smoothly and quickly, or if no obstetrician is present, is great. The dilatation of the maternal tissues does not take place by that part of the child which is the largest and hardest, but it comes behind and hence has to pass through the not yet sufficiently dilated genital orifice. Thereby the circulation of blood in the umbilical cord is obstructed by the pressure before the mouth and nose are free for respiration. The danger of suffocation is all the greater the narrower the genital passage—that goes without saying. It goes without saying, too, that the situation is far more critical when it occurs in a primipara than when it exists in a woman who has already borne several children—just as even “normal” danger to the child is greater than when the vagina and perineum have not yet been made more extensible by previous births.

The conclusion to be drawn in this case, too, is self-evident—prevention of the abnormal presentation by supervision and possible correction in the last period of pregnancy ; and competent assistance at hand if for any reason the preventive measures have failed.

With these words the whole of “natal hygiene” is summarised. For, in them is comprised the whole of parental hygiene in the widest sense (making the child as viable and strong as possible) and the whole of *midwifery*, the aim of which is to make delivery easier and to obviate the dangers connected with it.

How the mother can conform to the precepts of natal hygiene, that is to say make possible the best chances of birth for her child, is shown then by the following rules : she should give the child the best physical and mental tendencies she is able to confer on it ; she should conceive



it under the most favourable conditions ; and whilst she carries it in her womb, she should ever bear its welfare in mind. She should endeavour to get the best obstetric advice for the pregnancy and the best assistance for the delivery. She should follow the advice given her by her competent advisers, and, after she has entrusted herself to these advisers, should further give them her full confidence. During pregnancy, particularly in the last months and weeks, she should submit to regular obstetric guidance. At the beginning of labour, she should give the obstetrician the opportunity of examining her, and she should follow scrupulously his directions during the labour.

If she conforms to these demands, she can then, humanly speaking, be certain that the birth will be not only for her child, but also for herself, an ideal birth.



## CHAPTER V

### THE ARBITRARY DETERMINATION OF SEX. AN INTERMEDIATE QUESTION : BOY OR GIRL ?

THIRTEEN girls in succession were born to a famous professor whilst, at the same time, the wife of his house-superintendent had boys only. This gave cause for jesting, and was at least annoying. Tragedies, however, do happen because children are not of the sex desired ; and it is comprehensible that human beings, even in the most ancient times, made efforts to find a way to fulfil their desires with regard to this.

An ideal birth in the sense of this book should, of course, also be a desirable birth, the child corresponding to *all* the expectations of the parents. Intellectual and sentimental reasons, family questions and questions of succession often cause the desire for a child of a certain sex to come definitely into the foreground. Innumerable marriages have been wrecked by this wish not being fulfilled ; and the map of Europe would now have a different appearance had in this or that ruling house a successor to the throne been born at the right time.

In popular belief—and not only in civilised nations but also among primitive peoples—there is a firm conviction that a determination of the sex of a child as desired is quite possible. In this domain, an infinite number of customs of great ethnological and psychological interest are well known. Most of these customs have an animistic conception, the idea being to consign something male to the young wife. At the wedding, people put a boy in her arms, or put a man's tool or perhaps a garment into her bed, make the husband get into the marriage bed with boots and pipe, or do similar symbolical deeds. But certain times for fecundation, too, or certain ways of nutrition for the wife



are given in many old precepts. Many old religious rules, as well as Hindu and Chinese love books, give instructions in this matter. Likewise, in the domestic laws of many noble families, there are orders about the time of the marriage and the first cohabitation which are drawn up with regard to the desire for an heir. In relation to this, it may be noted as interesting that, although people more often want a boy for their own child, generally they prefer a girl as an adopted child. In the former desire, the head prevails, and in the latter the heart.

It is, of course, very questionable whether it would be a good thing if mankind could determine arbitrarily the sex of the child in every case. Although there are neither ethical nor religious objections to influencing nature in this way, yet such a possibility if it were generally accessible would give rise to many problems of a personal, social and political nature. At present however we are still as far away from it as from the arbitrary influencing of the weather, and so we need not worry about difficulties of this kind.

Meanwhile, it is undeniable that in many *individual cases* it would be of the greatest importance if it were possible at least to increase the *probability* of begetting a child of a particular sex. Therefore, it seems to me necessary to bestow attention also on this side of sex at choice, and to explain what possibilities science discloses in the matter. It is not my intention, however, to collect and discuss everything that has been stated about it; but I am going to confine myself to examining the methods recommended as to whether they seem at all able to influence the determination of sex.

The reason it is so difficult to get any lucidity in the vast mass of advice with regard to this, is that even the most stupid and useless expedient can count on success with 50 per cent. of certainty (in boys even more). The statistical method would get us further only if we could test every single procedure in long series of experiments, which is, of course, hardly possible. And experiments on animals have the disadvantage that they cannot simply be trans-



ferred to human beings because, with the latter, things are different in many respects.

Theoretically, the whole question would be simple to solve if we knew on what the sex of the future child actually depended. But here we have an obstacle already. Research has by no means reached agreement on this point ; individual observations contradict each other to some extent, or are variously interpreted, so that it is difficult for the layman to get a clear idea of the present position of the problem. Nevertheless, I must try to sketch at least the outline of the theories at present under review, for only on the knowledge of the factors which *determine* sex can practically useful methods for the arbitrary *choice* of sex be based.

As early as the beginning of the nineteenth century, more than five hundred theories about the determination of sex were counted. Many even go back to ancient documents of Chinese, Hindu and Chilian origin or to Greek literature. Thus, the opinion again advanced at the present day that the right ovary gives more or exclusively boys, was advocated as early as the fifth century B.C. by Greek physicians. Also another modern theory that the semen merely plays the part of a liberating factor—many experiments on animals in which fecundation is influenced artificially, chemically or mechanically tell in favour of this theory—was advanced by *Aristotle*. And the present-day hypotheses regarding the decisive *rôle* of the maturity of the ovum in the determination of sex had practical application long ago in the precepts of Oriental love books thousands of years old.

To make the survey a little easier, I am going to assemble the various theories in groups : one group sees the decisive factor in the age of the parents ; a second in their state of nutrition or strength ; a third, however, takes the view that the germ-plasm itself is the determining factor, in which again some make the ovum responsible for the result, other the spermatozoa, others again the reciprocal relation of these two.

Now there are theories which are interesting in themselves, and can, besides, be applied to experiments in animal breed-



ing, as here one has a free choice in the animals to be mated. But they have little practical importance for human beings, because with married couples we have to deal with particular individuals, and therefore with established conditions which cannot be altered arbitrarily as in an experiment. However, I will briefly mention these theories because, in some circumstances, the conditions required by them happen to be known and can then also be complied with. Moreover, there may be isolated cases in which the desire for a child of a particular sex is so strong that the desirer will act in accordance with it in the choice of a mate.

What has been said holds good, for instance, in all theories which see the decisive factor for the determination of sex in the *age* of the parents. Statistical inquiries into this question, it is true, do not show quite unequivocal guiding lines. In an examination of two and a half million children, it was observed that *very young* and *very old* mothers get a preponderance of boys as first children. There is, besides, a moderate preponderance of boys in those marriages where the fathers are about ten years older than the mothers. Moreover, very young fathers with very young mothers also get boys more often than girls as first children; whilst women at the height of maturity more often give birth to girls.

Other circumstances to which value is attached in various theories, such as the *season of the year*, *climate*, the altitude of the dwelling place, can only get consideration in exceptional cases. Nevertheless, it is interesting to find that statistics show a preponderance of boy births if the children are conceived in the late summer, or at altitudes above 500 metres. In suitable cases, one can make use of these two circumstances to increase the probability of the desired birth of a boy.

Certain influences, such as the "rhythm of life" according to the period theory, the astrological constellation, and many other more or less supernatural powers, are very variously esteemed. While some regard them as authoritative, others put belief in them on the same footing as that for the ancient incantation ceremonies and super-



stitious rites of primitive peoples. I do not presume to judge the numerous theories of this kind in which sometimes, under all kinds of mysterious overgrowths, there lies hidden a true observation of nature ; and I leave to each individual the belief which gives him most satisfaction or makes him happy. Finally, there is much in the world which has an effect without exact science being able to compute it in figures or by mechanism. Besides, it can hardly be maintained that astrology, for example, stands on weaker foundations than the "compensating tendency" which in a shortage of one sex is said to bring it about by natural necessity that more children of this sex are begotten.

Especially after wars, an increase in male births is believed to have been shown. In this case, the compensating tendency just mentioned is said to come into operation owing to the fact that the comparatively few men are in great demand and the nutrition of the population is reduced. Both explanations, which, moreover, by no means turn out to be generally true, encroach on another domain, namely, on that of the maturity of the spermatozoa, and that of the general constitution of the parents.

The modern theories of constitutional investigation have, of course, also their ancient precursors. When, to give an example, in ancient writings it is said : the "stronger sex" puts its seal on the future child, or passionate, slender fathers beget a preponderance of boys, then it is in fact a question of views regarding constitutional peculiarity. Also the fact brought out by statistics that with relative in-breeding, as is the rule in remote valleys, the number of boys is higher, appertains to a certain extent to this.

Now the *constitution* of a human being, that is, his general physical composition, is, on the whole, stationary ; but modern constitutional theory has ways and means of bringing about a certain change in this composition. In addition, it differentiates between "constitution" and "condition," which is the general state of the body at a certain time. A man of athletic build—just to make it clear—is fundamentally different from a narrow-chested asthenic (weak man) ; but his condition can vary much at different times



according as he is at a high grade of his physical constitution by suitable nutrition and exercise, or at a low one owing to debauchery and laziness.

There are, in the main, four ways which lead to a gradation of the constitution or to its change of tone respectively : the mode of life, nutrition, constitutional therapy according to *Aschner*, and influencing the endocrine glands (glands with internal secretion).

There is not the least doubt that a natural, hygienic way of life which has all the organs acting properly, furthers the development of the future child. I have already discussed this in another place. Any assured influence of such a mode of life on the determination of sex, however, cannot be proved.

It is quite a different matter with nutrition. Many ancient precepts with some mystic embellishments contain rules for nutrition for expectant mothers. Thus, an ancient Hindu physician gives a woman who wants to bear a son the advice to keep apart from her husband in a bed prepared from certain plants, and to take a special diet of sesame oil and a certain kind of bean. Only on the fourth day, when washed and dressed, was she to show herself to her husband amid mystic-religious ceremonies. The husband, too, got directions about his food : he was to eat rice cooked with butter and milk.

In general, the various rules of diet amount to this, that the mother who hopes for a boy is to be only moderately or badly fed. I will not, however, omit to mention that the contrary advice is also given.

One of the first to try to determine sex arbitrarily in animals by diet in a great number of experiments was a breeder in Texas. When he wanted to get young bulls, he had the cows fed abundantly ; the stud bull, on the other hand, he had weakened by restricted diet and frequent coition elsewhere. He followed the reverse procedure when he wanted young cows ; he fed the mother badly and had her go about with newly-castrated young oxen, who made vain attempts to cover her. It is possible, however, that with this method, the decisive factor consists in the semen



suffering a certain injury, or the ovum undergoing a change, but that the constitution or the general condition respectively is not of so much importance.

The theory of nutrition advocated by *Schenk* was particularly emphatic. He started from the observation—moreover, not sound—that diabetic women give birth chiefly to girls, and on this based dietaries for pregnant women. Scientific investigation produced no evidence in support of *Schenk's* theory, but when Czar *Nicholas of Russia*, after four daughters had been born to him, applied to *Schenk* for advice and, after following his dietary, the Czarina actually brought an heir into the world, *Schenk's* theory got a great deal of publicity in the Press. The extravagant hope that now the problem of the determination of sex was solved, of course, soon proved a delusion.

By dietary alone the sex of the child can certainly not be arbitrarily determined. But nutrition is not wholly without value all the same, although it is only to be used as an accessory expedient. In practice, all rules concerning this must in any case be certain to keep clear of the experiment being made at the risk of the mother's health, or of the prospects of the robust development of the child. Further, care must be taken, on principle, that expedients are practised only before pregnancy, or at most, in its earliest beginning, as later, of course, the sex is already fixed. I am going to speak of this more fully presently.

It seems to me best that the diet should be radically altered for a time from the usual by changing, for example, from a specifically meat or vegetable diet to the opposite; or, with people who are very fat, that metabolism should be increased by diet and suitable physical exercise. At the same time, the general way of life as well as the action of the bowels, the excretion from the skin and kidneys also, would usually become subject to new rules. In this way the results recorded by *Schenk* can easily be explained. Moreover, measures of this kind, if they are carried out in accordance with reasonable biological principle, also have a favourable effect on the general development of the expected child, and they are, therefore, to be recommended



even when the actual object of sex determination is not to be attained by them.

To go into the constitutional therapy aroused to new life by *Aschner* would take us much too far. I do not know whether it has been applied in any particular to sex selection. Widespread as it was for many centuries, it would not surprise me if it had also been applied to this. And, in any case, I would consider it proper if it were brought into use as an auxiliary measure in suitable circumstances by a doctor experienced in these methods of treatment.

As we gained more insight into the exceedingly complicated collective action of the ductless glands, the idea came naturally that the sex of the child might be influenced by the ductless glands of the mother, just as the development of the sexual characteristics in the young as they grow up is determined by specific glands.

In *Schenk's* theory of nutrition, the sugar content of the blood played a part. As you know, this can very easily be influenced by the incorporation of the hormone of the pancreas, insulin. Now, if insulin is administered to rabbits in heat, they do *not* become pregnant. Consequently in experiments on animals, this is a method of producing temporary sterility. Now, if the animals mate again a few months later after the effect of the insulin has died away, they produce almost exclusively female young. This fact is explained by the maturation of the ova being influenced by the insulin in the blood.

A transient sterility is got also by administering the hormones of the ovaries in very great quantities to the female animals. These animals, however, when they become pregnant again bring far more male young into the world than in normal conditions. Even in experiments on animals, enormously big doses have to be employed to get such a result. Moreover, contrary results are even known to occur. Interesting as these experiments are theoretically, and simple as the procedure would be in practice, yet they cannot be applied to man at least in the meantime. The reason for this is that all these substances are very difficult to estimate in their effect, because the



various endocrine glands act in complex conjunction with and against each other, and the effective quantity of their secreted products is also very difficult to determine. Any excess, however, obviously harms the generative glands, as may be concluded from the temporary sterility, just as, to give another example, exposure of the generative glands to X-rays can also result in such a sterility. In all these cases, moreover, there is the risk that by treatment of this kind, very much damaged germ-cells may come to fertilisation. In experiments on animals, one can, of course, take a risk that is not allowable in man. In the present position of our knowledge, therefore, such an experiment in influencing the sex-determination with hormones carried out by the most careful specialist should be taken into consideration only under very special circumstances. Such circumstances would arise only when the desire for a child of a certain sex is extremely urgent, and other methods have so far proved unsuccessful.

In this connection, I would like to discuss a question which does not really appertain to sex determination, but which is connected with the functions of the endocrine glands mentioned: *prenatal diagnosis of the sex of children*.

When pregnancy sets in, the activity of the endocrine glands changes extensively, and on this depends the hormonal diagnosis of pregnancy. Now the idea of investigating whether the *sex* of the embryo could also be determined in a different combination of these internal secretions was an obvious corollary. And it was found that this is actually the case after a definite point of time in pregnancy. In this case too, there is nothing new under the sun, for even the Ancient Egyptians had a method based on this. They sowed spelt and barley in a vessel containing earth, and this was watered daily with the woman's urine. If the seeds grew, she was pregnant; if the spelt grew more quickly than the barley, then she might expect a girl. A result of this kind is easily understood when one knows that comparatively big quantities of these pregnancy hormones are discharged with the urine.



Incidentally, I might mention here that an explanation is sought in a similar way for the remarkable proportion between pregnancies with boys and with girls (far more boys are conceived whilst only very few more boys are born); the male product is more alien to the mother than the female. Hence the defensive reactions of the mother's body would be stronger, and the result of this would be the greater tendency in male embryos to miscarriage and premature birth.

As is clear from what has been said, the first two groups of theories about sex determination present only limited prospects of being able to make a choice of sex in practical life; for the age and circumstances of life as well as the constitution of the parents can be altered only within moderate limits. Now let us see what is the practical value of those theories which seek the decisive factor for sex in the *spermatoblasts* themselves. There are investigators who regard as hopeless any attempt at making an arbitrary choice of sex on this basis, because the sex of the offspring is settled from the beginning in the spermatoblasts of the parents, either "ab ovo," that is, from the ovum, or from the spermatozoon. If it is not possible to separate male determinant germ-cells from female before fecundation, then it is pure chance whether a male or female spermatozoon fertilises it.

One theory in particular which considers the sex determined beforehand in the spermatozoa has found much acceptance in science in the last decade. It started from very interesting investigations into the spermatoblasts of insects and other lower animals. It was found that in the maturation of the spermatozoa of these animals, two different kinds arise, which are differentiated by the number of chromosomes in the cell-nucleus. In order to understand this properly, one must know that every cell-nucleus has a number of chromosomes—constant for each species of animal—which plays an important part in the multiplication of the cells by cell-segmentation. In a certain phase of the cell segmentation, these chromosomes split each into



two sister chromosomes of which one half moves into one, the other half into the second of the new cell nuclei, so that again two cells with an equal number of chromosomes in the cell nucleus arise.

In human body cells, the number of chromosomes amounts to twenty-four. In the formation of spermatoblasts, however, we come eventually to a stage in cell-segmentation when the chromosomes are not first halved (karyokinesis), and so cells with half the number of chromosomes come into existence. These are the mature spermatoblasts. These, accordingly, have only twelve chromosomes.

After this brief explanation concerning the circumstances in man, let us turn again to the investigation in insects which has advanced considerably further. It had been found in a species of bug that the cell nuclei of the body cells of the male have twenty-one chromosomes, those of the female, however, twenty-two. To be sure, in many species of animals (in man, too, this is the case) the missing chromosome in the male cells is found ultimately, but it is quite atrophied. The supernumerary chromosome in the female cell is called the X chromosome; its much atrophied partner in the male is named the Y chromosome.

Now, in the karyokinesis of the male germ-cells of this bug the fact that we have to deal with an unequal number of chromosomes leads to a peculiar result. That is to say, if the chromosomes—as mentioned above—do not split up, there is lacking a partner for the detached X chromosome; then of the 21 chromosomes, 11 come to one pole of the cells, but to the other only 10. Then, if the cell is divided into two daughter cells, one contains a nucleus with 10 (or 10 with an atrophied Y chromosome), the other nucleus with 11 perfect chromosomes. In the karyokinesis of the female germ-cells, however, which contain the 22 perfect chromosomes, there arises a pair of cells of equal value, each with 11 perfect chromosomes.

Now if in fertilisation, one of these male cells with only 10 chromosomes is united with a female cell which contains its 11 complete cells, then there comes from this union male offspring with 21 chromosomes in each cell. On the other



hand, the union of a male germ containing 11 chromosomes with a female germ-cell produces female offspring with 22 chromosomes in each cell.

In spite of the chromosome division in other animals being much more complicated than I have represented here, the discovery of the zoologists just described caused great enthusiasm among scientists, which is all the more comprehensible as it could very well be connected to the facts of the doctrine of heredity. The idea that sex may be just as inheritable as any other character of the parents—an idea which *Gregor Mendel*, in his first experiments with red and white flowering peas, had not been able to dismiss—now no longer appeared “too strange,” as this father of the doctrine of heredity had designated it.

As I have already explained in more detail in the first chapter, the basis of every hereditary character consists not of one hereditary determinant but always of a pair of determinants, one half of which comes from the father, the other from the mother, and of which one half is more prominent, *i.e.*, predominates or, as the expression goes, is dominant. This law holds good also in the sex determinants. Since 1907, there have been many investigations which confirm that the inheritance of sex is subject to the well-known Mendelian laws, and that the *two* halves of the hereditary characters are always demonstrable. This, as we all know, is true also in the physical and mental respect for the sex determinant in human beings.

In human beings—also in the higher plants, most insects and mammals, this is likewise so, whilst in butterflies and birds, the reverse is the case—the male individuals are capable of transmitting both sexes; the female, on the other hand, only the basic characters for their own sex. Now, in conception, the hereditary female determinant of the female can either encounter a male determinant or a female determinant of the male. Since the male determinant is dominant, there results, according to *Mendel's* law, 50 per cent. male and just as many female sex characters in man, *i.e.*, just as many determinants for boys as for girls. Precisely the same proportion results from the pure chromo-



some theory. As we all know, however, according to all the statistics of new-born children, there are 106 boys to 100 girls, and if we count the premature and still births, even 116 boys at least to 100 girls. Efforts have therefore been made to explain this proportion, which does not coincide with the pure chromosome theory. By theoretical consideration and by means of very cleverly planned experiments, the assumption was arrived at that the male determinant spermatozoa which, as we know, have one chromosome less, had a greater mobility and skill in overcoming obstacles than the female determinants, which have one chromosome more. In cases where very great obstacles have to be overcome, *e.g.*, when very young or relatively old women become pregnant for the first time, or, in conception, near the time of menstruation as well as in other impeding circumstances, the boy determinant spermatozoa thus gain an advantage. The greater number of boy births in such cases may be explained by this, and the greater mortality of the male embryos as well, because the very spermatozoa from which these proceed may not only be more agile, but also weaker both in themselves and as a result of the obstacles which they have had to overcome.

(For completeness, I might interpolate here that the doctrine of heredity also tries to explain the remarkable ratio just mentioned. It knows, that is to say, of the so-called "transmissible lethal factors," that is, hereditary characters which make the embryo non-viable. Now it is assumed that there are such lethal factors connected with the male sex which do not permit the organism to live in the male form.)

There are other theories which regard the determination of sex as in the semen, but see the determinant not in the number of chromosomes but in other circumstances. Thus, quite recently, a Russian investigator maintained that with the help of electric current, the spermatozoa can be separated into male and female, the male determinants proceeding to the cathode.

Other investigators showed by experiments that a certain damage to the spermatozoa suffices to bring about an



excess of boys. In this, it does not matter whether this weakening takes place by the spermatozoa coming to fertilisation in a still rather immature state, or by having mechanical or chemical obstructions put in their way, or by being damaged by external influences. The higher mortality in boys is explained by each investigator in the light of his own theory.

The theory that the male determinant spermatozoa are weaker in some way has something to be said for it, although practical conclusions are to be drawn from it only with caution, for the risk that in an intentional weakening of the semen, a boy does result but that he suffers owing to damage to the germ is, theoretically, only too obvious.

In any case, however, I consider the method of attempting to influence sex in man by actually damaging the male spermatozoa to be impracticable. How far a "natural selection" of the spermatozoa in this direction can be achieved by different expedients we shall see later in discussing other theories.

As regards the *rôle* of the ovum, we find scientists' views almost parallel with those in the case of the spermatozoa. Here, too, there are investigators who take the view that the future sex is settled from the outset in the ovum, whilst others support the opinion that it is dependent on the state of maturity, on nutrition or other influences which reach the ovum before impregnation, whether a male or a female product results.

Various observations on the ova of crayfish, worms and insects, in which it was possible in certain circumstances to demonstrate certain differences between male and female determinant ova, are in favour of the former view. *Leupold* found in the ova of rabbits that the nucleus sometimes contains a compound of phosphorus histologically capable of being stained, but sometimes not, and that from the former ova come females, but from the others which lack that compound of phosphorus come males. *Fels* corroborated these microscopic observations also in the male egg, and ascertained the difference in staining even in the early



stages of the ovum. It is questionable, however, whether this peculiarity of the ovum is not the expression of a certain stage of its nutrition, which, to be sure, may be of the greatest importance for its further development.

Whilst these theories concerning the *rôle* of the ovum give no, or only a slight, possibility for the arbitrary selection of sex, those which follow have a positive basis in regard to it.

In animals, in which both "heat," *i.e.*, the time of maturity of the ova, and mating can be closely studied, one could easily investigate whether the proportion of sexes in the offspring depends on the maturity of the ova. (Nor is this idea new either; as early as the Middle Ages, it was advanced by *Avicenna*.) If, for instance, female frogs are not admitted to males till after "heat," so that only over-mature ova could be fertilised, then males almost exclusively come from the larvæ. Similar results are got in the higher animals, in wild and domestic animals, if they are not allowed to copulate till the latter part of heat.

Now this observation of the zoologists was tested by the gynæcologist *Siegel* when, during the war, a good opportunity arose, in the case of the men on leave, of investigating the relations of the maturity of the ovum and the date of copulation to the sex of the child. He found a striking agreement with the experiments on animals. That is to say, if sexual intercourse took place soon after ovulation, that is, after the date at which the ovum emerges from the ovarian follicle (Graafian follicle), and hence the ova present were still very young, then girls were born, but if it took place later, then boys were born. *Siegel* found approximately the same situation, as in the wives of men on leave, in primiparæ who became pregnant within the first six weeks of marriage; that is, did not menstruate again after their marriage or menstruated only once.

In cases where an ovary had been removed by operation, and, in consequence, great demands were made on the remaining one, and therefore it would be difficult for any more over-mature ova to be formed, he found girl offspring predominant; on the other hand, with young primiparæ



whose very viable ova are supposed to tend to over-maturity, he found far more boys.

By reason of his enquiries which, it is true, could only partially be easily reconciled with his maturity theory, *Siegel* advanced the following formula: if sexual union takes place in the last days before or up to the ninth day after the commencement of menstruation, then 80 per cent. boys result. Between the tenth and fourteenth day about an equal number of boys and girls are begotten, whilst intercourse from the fifteenth to the twenty-second or twenty-third day after the last menstruation, gives 80 per cent. girls. The last days preceding menstruation, *Siegel* at first regarded as sterile (we know *Knaus* and others quite recently also maintained the sterility of the days before menstruation), but saw later that in these days too the possibility of a conception does exist. Children conceived in these last days were, in *Siegel's* material—in this respect, however, much too limited—all boys.

This very simple theory, it is true, found a certain amount of confirmation in the statistics of counter-examinations by other investigators, but was also attacked from various sides. First of all, the objection was made that these circumstances could also be explained differently. The difficulties here lie chiefly in our ignorance concerning the exact time when the ovum is expelled.

Now, in order to realise the state of affairs, let us call to mind for a moment the processes as I have already described them in Chapter VI. of the first volume and in Chapter IV. of the third volume of my "Trilogy." The ovum growing in the maturing Graafian follicle of one of the two ovaries is usually expelled from the ovary on the twelfth, perhaps even not till the fourteenth or fifteenth day, after the commencement of the last menstruation. It begins its fourteen-day journey through the Fallopian tube to the uterus, and thus accomplishes its separation due to maturity. If, on its way, it is fertilised—and that mostly at the beginning of the journey through the Fallopian tube—then it establishes itself in the mucous membrane of the uterus; this does not disintegrate as usual on the twenty-



eighth day (after the commencement of the previous menstruation) ; menstruation does not take place, but the ovum already consisting of numerous cells now grows into a child.

On the opposite path, the spermatozoa deposited in the sexual union near the outer os uteri has to go all the way through the uterine cervix, the whole uterus and almost the whole length of the Fallopian tube to find the ovum. This passage, in proportion to the smallness of the spermatozoa—they are about five hundredths of a millimetre long, and their head only four thousandths—is enormously wide and full of obstacles. That it can be surmounted at all is a miracle scarcely within human powers of conception. But how long it takes we do not know precisely. It obviously depends on numerous contingencies. If we imagine a dwarf not more than three inches in height (we thus increase the spermatozoa, *i.e.*, their essential part, the head, twenty thousandfold), standing at the foot of the highest mountain in Europe—this corresponds in the same ratio of increase to the passage from the os uteri to the beginning of the Fallopian tube—proceeding upwards over hills and valleys, ravines and walls, through streams and storms, in order to find up there its mate sitting concealed in one of the thousand crevasses. Our dwarf, it is true, can go with considerable speed, and is an excellent mountain climber, but it is obvious that it gets him on relatively faster if a storm-thrust happens to hurl him from one peak to another than if he had to pass through all the valleys between.

No doubt it is like this, too, with the spermatozoa on their journey through the confusion of folds in the uterus and the mucous membrane of the Fallopian tube. And the passage through the uterine cervix can be greatly shortened for it if, as a result of the orgasm, the semen with the mucus of the cervical canal is drawn up a bit further. The way can be made still easier in some circumstances perhaps by a flow of secretion in the womb. Thus is explained the fact that as early as an hour and a half after coitus spermatozoa have been found in the woman's Fallopian tube. This is, of course, exceptional. Usually, it should take at



least a few hours for the spermatozoa to reach the upper part of the Fallopian tube.

Two French investigators have ascertained quite recently that the mobility of the spermatozoa depends greatly on the nature of the secretion of mucus in the uterine cervix, which, in its turn, is governed by the hormones of the ovary. If this mucus is clear and thin, then the spermatozoa can ascend much more quickly into the uterine cavity than with a viscous or purulent secretion. They attribute easy or impeded conception on the various days between two menstruations to the variation in the composition of the contents of the womb.

Now, on the one hand, the spermatozoa, if they have once reached the, to them, congenial surroundings of the uterus, are capable of living for a fairly long time. Some investigators, it is true, think that even there they live hardly longer than three days; others, however—and I have explained in the third volume of my "Trilogy" why I side with these latter—assume that the spermatozoa in favourable circumstances live up to ten days. On the other hand, in accordance with my experience, I also adhere to the opinion that the possibility of fertilisation of the ovum likewise lasts longer than only two days, as some writers state. For I know cases in which, either owing to the temperature curve or to the so-called inter-menstrual pain (the pain which some women feel at ovulation), the time of ovulation was ascertained precisely, whilst the considerably later time of the only (or first) following copulation to which healthy children owe their lives was likewise known.

Hence it may well be possible, although only in exceptional cases, that impregnation takes place a very few hours after sexual intercourse if the spermatozoa come across an ovum very quickly. Just the contrary also, however, may occur, and impregnation does not take place till several days after the union of the husband and wife, because the spermatozoa make their way very slowly or have to wait for an ovum.

Now, from these particulars, it follows in practice that: Assuming that sexual intercourse has taken place on the



fourteenth day after the commencement of the last menstruation, and that ovulation has actually taken place on this or the following day, then the "young" ovum is not certain to have been impregnated on this or the following day, for this may, in some circumstances, not happen till several days later when the ovum is already "over mature." Thus *Siegel's* theory as such becomes very unreliable.

In addition, there is a second source of error; the time of ovulation is not quite certain. At least, in various women it is not always the same. In general, I believe, I admit that in the majority of cases the ovum is set free from the Graafian follicle on the twelfth day after the commencement of the last menstruation, and that only in exceptional cases does it continue for some time longer attached to its place in the follicle; while it may perhaps happen more frequently that, if an orgasm in copulation happens to take place, the follicle bursts prematurely.

However, I will not conceal the fact that some writers have a different opinion with regard to this. Thus, some put ovulation off to the fifteenth, others to the nineteenth day, while *Brodauf* differentiates two different types of ovulation; type A in which the ovum is released about five days before the fresh menstruation sets in, and type B in which this takes place about seven days after the last. If one allows four to five days for the actual menstruation, this type B agrees approximately with my opinion.

Thus we see that we cannot determine with absolute certainty either the momentary state of maturity of the ovum or the time of the actual impregnation.

This explains the often quite contradictory formulæ of various authors regarding the best time for conception in general, and for the procreation of boys or girls in particular. I give here only the statements of two investigators along with those of *Siegel* :—

<i>Siegel.</i>	<i>Brodauf.</i>	<i>Bolaffio.</i>
1st-9th day, Boys	4th-11th day, Girls	5th-7th day, Girls
10th-14th ,, Equal	12th-19th ,, Boys	8th-9th ,, Equal
15th-22nd and 23rd day, Girls		10th-20th ,, Boys
23rd-(24th)-28th day, Boys		



Finally, another important objection to *Siegel's* theory may be advanced. In order to be able to explain the most important fact of his conclusions, namely the very great percentage of boy births which come from procreation in the first days after menstruation by an over maturity of the ovum, he has had to resort to the imputation that the non-fertilised ovum survives menstruation (in the Fallopian tube), and is only impregnated in connection with a copulation which has taken place after menstruation, an imputation which, according to the general conception, I too share, seems too daring. I would rather regard it as probable that the said boy births come from premature ovulations provoked by coitus which produce ova not yet quite mature, and assume that the relative immaturity of an ovum has the same effect as regards the determination of sex as over-maturity.

From what has been put forward, it can be seen that what *Siegel* established damages the theory on which it was based, and that his doctrine, in spite of the importance of his practical conclusions, must in its original form be regarded as untenable. Therefore, in recent years, there has been less talk about this theory, although the maturity theories can certainly not be rejected offhand.

Another opinion about the *rôle* of the ovum in the determination of sex, which, however, proceeds from quite different points of view and at first met with little approval among specialists, is now being investigated very seriously. I refer to the theory of *Otto Schöner*. By numerous gynæcological examinations, and also by observations in operations and in dead bodies, he ascertained that both ovaries certainly may supply both boy- and girl-dominant ova, but that the right ovary gives about twice as many boys as girls, and the left, on the contrary, twice as many girls as boys. Alternately, in the right and in the left ovary, an ovum matures—those of the right, however, were rather more often fertilised—and hence it results, as *Schöner* thinks, that in successive ovulations the succession of the sexes goes in quite a definite rotation.

For instance, if the ovum last fertilised had been from



the right ovary and a boy resulted, then the ovum of the next ovulation must come from the left ovary, and when fertilised a girl must come of it ; that of the following one, the third, would again produce a boy, that of the fourth from the left ovary a girl, that of the fifth from the right ovary again a girl, that of the following one, the sixth, from the left, a boy. From this point, the series is repeated. From the following table, for instance, one could reckon that, according to this theory, the eleventh successive ovulation—in the table designated twelfth, *after* the first time, a male ovum from the right ovary (1 Ov. in the table) had been fertilised—will again give a boy, but this time from the left ovary, while the preceding tenth ovulation (reckoned *after* the 1 Ov. which had led to a boy and thus called the 11 Ov.) had produced a girl.

RIGHT OVARY.	LEFT OVARY.
1 Ov. Boy. }	2 Ov. Girl. }
3 Ov. Boy. }	4 Ov. Girl. }
5 Ov. Girl.	6 Ov. Boy.
7 Ov. Boy. }	8 Ov. Girl. }
9 Ov. Boy. }	10 Ov. Girl. }
11 Ov. Girl.	12 Ov. Boy.

In proof of this theory, which he obtained from the particulars of the birthdays of a series of children of one woman, and the statement of the sex of the two first children, *Schöner* was able to estimate correctly the sequence and the sex of all the rest.

Now, since in many cases it can be ascertained by a gynæcological examination just from which ovary an ovum issues, as the menstrual periods of women, by keeping accurate notes, can be settled or else calculated, *Schöner* maintains that the sex can be selected arbitrarily with great certainty, even in the case of the first child but, with later children, with mathematical accuracy, as he attributes no importance at all either to the uncontrollable state of maturity of the ovum or to the ungovernable chromosomes of the semen.

It is objected to *Schöner's* assertions, however, that the



position of the Graafian follicle which has just burst can by no means be ascertained by gynæcological examination with such certainty as he maintains, and that the number of post-mortem and operation results instanced by him is too small. Likewise, the assertion of the regular alternation between right and left is called into question. Further, *Schöner*, it is objected, treats the number of menstruations as equal to the number of ovulations, which is not correct, as the ovum following the last menstruation is fertilised. Thus, a woman who had menstruated twice after a confinement has three, not two, ovulations if an ovum is again fertilised.

This last objection to be sure—as far as I can gather from *Schöner's* works—is allowed for by his calculation of 280 days for pregnancy, and for the nursing period 42 (that is, 28 and 14). As to the justification for the other objections, there certainly seems to me to be a particular difficulty in the fact that in many women ovulation and menstruation do not proceed so regularly as is often supposed, and as might be desirable for these calculations. Unfortunately, only a very few women have the habit of making accurate and uninterrupted notes with regard to their menstruations. I am taking this opportunity of referring once more to the importance which these regular notes have for the supervision and proper judgment of the vital, specifically female functions, and the general state of health of the woman concerned.

And, finally, as far as my opinion of *Schöner's* theory is concerned, I must say that I do sympathise with the opposition which many doctors feel towards such arithmetical biology; but that, on the other hand, I have got the impression, from what *Schöner* has said of the results of his investigations, that his statements are worthy of testing seriously in a great number of cases. Furthermore, there seems to me no objection to making use of this theory as a foundation for practical experiments.

From a line of thought, which so far we have only just touched upon, comes a practical method for the arbitrary



determination of sex which has recently made a great deal of talk, and was first advocated in regard to man by *Unterberger*. It depends on a kind of theory of selection of spermatozoa by means of external circumstances.

*Unterberger* has found in women who were under treatment with him for sterility that the vaginal contents had a markedly acid reaction. After he had made the reaction alkaline by means of douches with a solution of sodium bicarbonate, pregnancy very often took place, and noticeably almost always with boys.

Therefore, in cases where a male child was wanted, by douching with the solution mentioned, and by dusting the male member lightly with sodium bicarbonate respectively, he brought about a weak alkaline reaction in the secretions of the sexual organs if he had previously ascertained an excessively high lactic acid content there. In the course of twelve years, he had positive results in seventy-four cases by this method.

*Unterberger's* procedure depends upon the influence of the external circumstances on the vitality of the spermatozoa. Experiments in this direction, which also take into account the *rôle* of the other secretions of the male genital glands, such as epididymis, seminal vesicles, prostate, support this view. It is likewise considered probable that the secretions of the various sexual organs are influenced by food, by the general conditions of life, and by many other circumstances besides. Further, it is certain that the lactic acid content of the vaginal secretion shows regular fluctuations which are connected with the menstrual cycle. Thus here we again come across various factors which we have already deemed worthy of mention in the discussion of other theories, and may very well suppose that those factors may be effective also in this direction of influencing the reaction of the mixture of the female and male secretions in the sense of secondary determination of sex. An influence of the reaction of the vaginal content in this respect agrees in a certain sense also with *Siegel's* observation of the increased number of boys in conception just after menstruation; for, apart from the fact that the admixture of the



alkaline menstrual secretion can influence the reaction of the vaginal contents in this direction, sexual desire—so the supporters of the theory under discussion explain—in the woman is increased at that time, so that in copulation it comes to the discharge of greater quantities of alkaline secretion from the cervical canal whereby the alkaline reaction of the vaginal content is increased. In the same way the significance of the orgasm in women could not but be explained, though this certainly does not exhaust the explanation.

Thus, various circumstances which, as we saw earlier, appear to exercise influence on the births of boys and girls, can, in fact, be brought into harmony with this theory. Whether, however, this must be explained in the sense of a selection of the spermatozoa by external circumstances is another question. For it is quite conceivable also that in this a "natural selection" of the spermatozoa is not involved, but because these tolerate a certain lactic acid content better than alkali, and that they are weakened a little by the sodium bicarbonate. Consequently male embryos would then develop. Since experiments on animals likewise confirm this possibility of influencing the spermatozoa by chemicals, and as it were harming them very little, then, it seems to me, the theoretic basis for *Unterberger's* method might well lie here. The fundamental question for its practical application then is changed to whether or not by this method any danger to the offspring is to be found.

I have endeavoured to make the foregoing survey of the theories of the determination of sex as simple as possible, and in the main to confine myself to what seems to give a handle for the practical selection of sex. I am afraid, however, that the information given is still rather confusing, owing to the profusion of contradictions. There is really no scientific agreement yet with regard to these questions. Still, many theories very different in their essence have yet much in common, as we have just seen in the discussion of *Unterberger's* method.



Now, since I do not intend to attempt here a scientific criticism of all the theories concerning the determination of sex, but I have a practical purpose in mind, I will put forward a kind of auxiliary hypothesis which comprises as far as possible what is common to the various theories reduced to the shortest formula, in doing which I leave it open to doubt whether this assumption is even theoretically indisputable. For I think a combined auxiliary theory of this kind gives a much wider basis for practical application than all the suppositions from one point of view only. The possibility of success in a practical trial of the selection of sex increases as soon as we can combine several methods, although they come from different hypotheses. Furthermore, I believe that none of the theories so far clears up the problem thoroughly, and that the determination of sex is not decided by one circumstance *exclusively*, but that even in reality (not only in my theory) various factors co-operate in it.

But can the contradictions really be got over if, in the first place, it is maintained that the sex is determined by the spermatozoa ; in the second, that it is determined by the egg-cells ; whilst there are still further reasons for supposing that external circumstances can also be of influence ? I cannot help thinking so. Thus, for instance, we can well imagine that there are two kinds of spermatozoa which are differentiated by their chromosomes, by chemical or electrical structure, vitality, mobility, power of resistance, and that these differently predisposed spermatozoa also react differently to external influences so that they can, to a certain extent, be sorted out.

On the other hand, it is just as conceivable that sex is determined by the ovum at the moment of impregnation, yet that it depends at the same time on external influences (for example, on the sugar content of the blood and on further circumstances of a similar or different kind) whether there is more likelihood that a male—*i.e.*, predestined for development into a human being of the male sex—or that a female ovum has been fertilised, an ovum in which a certain state of maturity is necessary so as to make it



capable of developing sex and specially of developing a particular sex.

In my opinion, there is in any case no absolute certainty that the sex of the child coming into existence is settled from the very beginning in the fertilising spermatozoon or in the fertilised ovum. A co-determinant influence of various circumstances is at least conceivable before, during, and perhaps also a short time after impregnation.

This, then, is my intention just expressed—I repeat again, there is no question of a scientific theory in it—to advance an auxiliary assumption, certainly not a wrong one; for practical consideration I will formulate it as follows:

*If a spermatozoon, which either from the start—owing to a reduced number of chromosomes—is predisposed in this direction or weakened to a certain extent by external influences, such as relative immaturity, comparatively unfavourable conditions of life as a result of certain peculiarities (principally of chemical reaction) in the male and female products of secretion or other chemical influences, impregnates an egg-cell with suitable preliminary conditions, and this egg-cell is predetermined in such a way by its origin—from a particular ovary—or is so influenced by certain circumstances, i.e., by relative immaturity (premature ovulation), or by the further maturation which has meanwhile proceeded in it (over-maturity, “growing old”), or else by certain hormonal influences or factors of metabolism that it has not reached or has passed the zenith of its vitality, then the resulting embryo has the determinants for the formation of the male marks of sex. The development of these is determined by the activity of the endocrine glands of the embryo, and is probably contributed to from the start by the action of the endocrine glands and the condition of the mother.*

As you see, I have also taken the later sex-development into consideration at once, for this does not mean that a predisposition is inherited, or otherwise present, in a cell, so that it, too, must come to full development; it may be latent there. This is true, too, of the characteristics of sex.

As already mentioned, in any case the possibility is



admitted that sex is not determined at all by the ovum or the semen, but that the primary constituent is indeterminate in itself, and only comes to development on one side by means of further influences. Thus, in other words, not determination of sex but the *development* of sex or perchance a change of sex might play a chief part.

In man and all classes of animals with separate sexes it is true the sex appears to be fixed, and a dual sexuality or a change of sex in mature individuals is an extremely rare exception explicable only by abnormal influences. Nevertheless, modern science takes the position that every individual is originally of dual potentiality as regards sex, that is, has the two determinant characters in him; and that the factor of inheritance influences only the direction in which basic characters are to come into existence, and which are to remain latent and invisible. Two significant facts compel us to make this assumption. The first is the original bisexual disposition of male and female animals, individuals whose sex cannot be recognised at all before a certain state of development; and the second is that there is the possibility of an artificial change of sex which can be effected even in individuals fairly far or already completely developed in the direction of one sex.

In the human embryo the sex can in general be distinguished first towards the end of the second month of pregnancy. Before then, there existed only a neutral organ—and this too was established relatively late—called the “Wolffian body” common to both sexes. It is followed by a stage in which the primary determinants of both sexes are present. From the sixth week of the life of the embryo, the male or female determinant gradually retrogrades so that (and in mature beings likewise) hardly any remains of the organs of the other sex are left. This one-sided development is now explained by the suggestion that the internal secretions of the one pair of generative glands impede—possibly indirectly by way of the other ductless glands—the development of the pair of generative glands of the other sex.

Now if, for some reason, the already developed generative



gland is destroyed, then the other becomes more active and we get the change of sex. In animals like butterflies, bees, ants, which have in accordance with their species a marked bi-sexual predisposition, such a change of sex is not uncommon. The milk-giving males and horned and bearded females respectively in goats and sheep appertain to this. They occur for the most part at an advanced age. In human beings, we have similarly the change of the secondary characteristics of sex, masculine traits in elderly women after the climacteric (moustache, deep voice, way of thinking) or feminine traits in men after certain illnesses. Finally, the whole question of experimental change of sex, such as became generally known owing to *Steinach's* experiments, would be impossible if the sex as a homogeneous whole were originally fixed in the cells by transmission.

Most convincing in this respect are perhaps the results of the zoologist *Harms*, who succeeded in changing full-grown male toads after castration into females within about four years by appropriate feeding with food rich in albumen. The male sexual organ was transformed, they acquired an ovary, they were even mated and laid very big, strong eggs from which came normal toads.

Further, the experiments of numerous biologists who changed the initial development of sex of fertilised eggs by means of environmental influences such as warmth, moisture, food, light, have similar significance.

It is clear from all this that, strictly speaking, only the primary constituent of sex is determined, and the development of the marks of sex can at least be promoted or impeded by external factors. In practice, this assumption signifies that experiments which aim at submitting the already fertilised egg to particular influences need not be quite ineffective. To be sure, we are not certain up to what time and in what circumstances influence of this kind would be possible. Meanwhile, we need not be surprised that animistic and occult ideas still play a very great part in this particular domain, just as popular belief in the various nations holds the opinion that the sex of the coming child can still be changed during pregnancy.



With the aid of the combined auxiliary assumption as to the determination of sex which has been quoted, we are now going to consider whether there is a practical possibility of the arbitrary selection of sex. This, in fact, appears to me conceivable on the basis of all the theories in combination here.

In the group of assumptions which consider the determiner to be in the semen, the spermatozoa, which are male-determinant, are considered quicker and more mobile, but also more easily injured. Consequently, from all the influences which hinder fertilisation to a certain extent such as age, the deposit of the mass of semen in the lower part of the vagina, certain conditions of the mucous membrane, the weakening of the male vigour by previous great demands on it; and, finally, from the possibility of a very slight weakening of the semen chemically (by a slight addition of alkali) come theoretically possible, and to a certain extent also practically, useful methods for the selection of sex.

In the other group of theories which consider the sex to be predetermined in the ova, the assumption that an ovum from a particular ovary will develop into a predestined sex discloses a path to selection. Then it is only a question of working out a suitable method of finding the right ovum. Every theory, however, which has the ovum a boy determinant only *after* its detachment from the ovary, must choose as a method for the practical selection of sex fixing a correct time for fertilisation, and that really is when the ovum is at a suitable stage for the conception of a boy.

All theories which attribute significant parts in the determination of sex to the general constitution, nourishment, mode of life, climate and similar factors, suggest the way to exert a practical influence by dieting, by changing the environment and the mode of living, as well as by artificially or biologically altering the state of equilibrium of the internal secretions as a preparation for conception.

Finally, all the theories which are based on psychological, mystical, extra-terrestrial, or supernatural ideas likewise give those who believe in them the chance of making use



of their methods, that is, of accomplishing conception after certain spiritual preparation, on certain days with certain customs, in certain constellations.

And last of all, there is besides still open for a certain length of time, the attempt at affecting the already fertilised egg by influencing the metabolism, and the collective action of the endocrine glands of the mother.

Thus we see that with all the theoretical uncertainty in this domain, it seems quite possible to work out on the basis of my assumption, which comprises all the possibilities mentioned, certain practical guiding lines which can be followed by the couple who want to determine the sex of their future child as they wish.

It is admitted, to be sure, that this advice cannot guarantee a hundred per cent. success; but, on the other hand, it should be borne in mind that by a sensible combination of several methods, the probability of achieving the desired success can be increased.

When in these guiding lines I adhere to the principle that they may not do harm in any circumstances, and if there is one failure, the possibility of success at the second attempt is greater, I believe that by so doing I am keeping within the fields of medical endeavour. For, in the treatment of sick people, too, the doctor often has to give advice which aims at restoring health, although theoretically he is vague as to the nature of the disease involved. Moreover, those doctors who want to get more precise information about these questions may find in the brief classification in the appendix to this chapter reference to literature which can give them information in matters of detail, so that in particular cases they can alter the general advice given here to suit their individual patients.

And now I think I have laid a solid enough foundation to do as I have done in all my books, viz., give my readers the most precise advice possible on this question, without appearing blind to the difficulty of the subject, or rejecting opposite views from the start.

For the sake of simplicity, I am giving all the advice for the time being as if the birth of boys were desired. From



this, deductions with regard to the procreation of girls can be made.

The measures to be taken may begin even before the desire for a child is quite definite. They begin with general physical hygiene. Physical work adapted to the condition of strength, mixed but not too abundant diet, plenty of air, light and water for the skin, mental occupation with plenty of variety, and not least, a harmonious married life give the soil from which healthy children spring. A number of writers, moreover, regard all the measures quoted as more favourable for the procreation of boys. Though perhaps not very decisive for this purpose, yet their usefulness for mother and child is so great that they are in any case very worthy of attention.

The possibility of psychical influence by mental concentration, vivid imagination of the desired result, rapt contemplation of artistic works and the like is disputed. But, since no harm can come from experiments of this kind, and in themselves they cannot but benefit psychically healthy persons, nothing need be said against such methods even here. Possibilities of this kind, as well as those which depend on the influence of superhuman powers, I have, moreover, taken into account in the theory advanced by the insertion of the words "with suitable preliminary conditions."

For influencing the determination of sex by diet, no detailed rules can be given here. This depends on the one hand on the individual condition of the future mother, her metabolism, her habits of life hitherto, and her external circumstances; on the other hand, however, the attitude of her doctor to particular views on food is also important in the matter. In general, an experiment of this kind will have most prospects of success if the dietetic measures taken lead to a biological *change* in the body.

Whether any importance is to be attached to climate, place and time in procreation is—as convincing statistical information is lacking—a matter of personal opinion which, of course, people can follow. It is maintained that in summer—others say in autumn and winter, but late summer



appears to offer the best chances—more boys than girls are begotten. Since, in this case, the children are born in the following May or June, and thus have in the first months of life plenty of opportunity for enjoying light, air and warmth, this time (at least in so far as the birth takes place in a country with a temperate climate and in favourable conditions) seems to me favourable in any case, even though it should not always lead to success as regards the sex.

How far the age of the parents alters the prospects for the birth of boys I have already mentioned in discussion of the theory concerning this. In practice, the intentional application of this factor rarely comes into question.

The layman by himself is not in a position to influence the constitution by way of the endocrine glands. Accurate laboratory analyses are necessary for this. In cases where it matters a great deal whether a boy is born, the experiment of changing the maternal organism as desired may be made by suitable treatment with hormones. The actual treatment, of course, should be in the hands of an experienced specialist, for measures of this kind are anything but a matter of indifference to the body.

The measures which aim at altering the momentary condition are more important in practice. In this case it is thus a question of the physical condition shortly before and during the sexual union which is to lead to the desired child. For this purpose, the woman who hopes to give birth to a son can have short measure in food, in accordance with the statistical conclusions that with poor, badly-nourished people, a great excess of boys (115 to 104.5) is to be observed, and also in the badly-nourished urban population the number of boys preponderates, in accordance also with experiments on animals and with *Schenk's* nutrition theory. Yet since experience shows that such measures are often greatly overdone, I should not like to omit urging that a doctor be consulted in this case too.

Whether food has an influence on the quality of the spermatozoa in men I must leave undecided here. People think that, by reducing the nourishment of the man, the power of resistance of the spermatozoa is lessened, so that



the cells used under these conditions would also not be replaced as rapidly as usual, and only weaker spermatozoa would therefore be at hand for an impregnation. This would promote the birth of a boy.

There is no doubt that the number of copulations and the length of the previous abstinence respectively are of very great importance. We have seen that quite a number of theories are based on the state of maturity of the spermatozoa, making the comparatively young or weakened spermatozoa responsible for the development of the male sex in the child, and that consequently rules of conduct with regard to this seem comprehensible. Thus, if the man has been continent during menstruation, or, best of all, for a few days longer, and then, after very strong sexual exigence, undertakes copulation with the desire for a boy, then the probability is certainly greater that younger, perhaps also more mobile, and at the same time weaker, spermatozoa produce the impregnation. It is conceivable also that the accompanying secretions of semen in this case have a composition more favourable for achieving the birth of a boy.

Statements to the contrary, that after a very long abstinence and with infrequent intercourse a surplus of boys is to be expected, are supported by very little evidence. It might, however, be conceivable—and I mention this on account of its practical importance—in very long abstinence, as sometimes occurs with old men, for the fertilising spermatozoa to have suffered a certain amount of injury just because of their excessive age. With a man of mature age, however, I think that in this a fairly long—months long—and really absolute abstinence, that is even without involuntary nocturnal emissions of semen, would have been necessary.

Although there is so much to be objected to in *Siegel's* theory, with regard to the connection between the state of maturity of the ovum which is fertilised and the sex of the child, that we cannot regard it as right in its original form, yet the practical results of his researches—even admitting that his numbers are too small for unqualified conclusions



to be drawn from them—make such a convincing impression in the essential points that, in my opinion, it would be a sin of omission to disregard them in practical attempts to determine the sex of the child as one wishes. His tables show that children begotten up to the ninth day after the commencement of menstruation are almost all boys, and hence it is obvious that a couple who want to get a son should be advised to carry out the copulation destined for it in those days, all the more so as no harm can come from it, and there is nothing to be said against it. Of the children who result from coitus which has taken place in the last days before menstruation the same can be said even to a greater degree. For if *Siegel's* too-small numbers are confirmed, only boys will result. To be sure, the prospect of an impregnation taking place in these days, is, in any case, much less than at other times. Also, I should not like to recommend choosing the very last days, because there is then the risk that the ovum may already be dying. So the twenty-fourth or twenty-fifth day may perhaps be the most suitable. On the whole, the prospect of begetting a son shortly after menstruation seems better than shortly before it. In face of this we might also say, on the basis of *Siegel's* experience, that copulation shortly before menstruation either results in no child or else in a boy.

For the procreation of girls, *Siegel's* tables give the fifteenth to twenty-second (twenty-third) day after the commencement of menstruation. Here, too, the results given by him—in so far as the not inconsiderable but still far too small number of observations permit a judgment—are convincing. And, in this case, too, there is nothing to be said against an attempt at practical application.

The word attempt must, however, again be specially stressed at this point. For, though the tabulated grouping of *Siegel's* conclusions cannot fail to impress the unbiassed reader, yet we should not forget that these conclusions do not agree with many of the discoveries of other investigators in the domain of fertilisation.

It should be kept in mind, too, that the dates given refer only to women who menstruate regularly every twenty-eight



days. For other types of menstruation, they would be made later.

After all, arranging copulation for a definite date is bound up with making notes of menstruation. As I have already emphasised, every woman should keep an accurate menstruation diary in which the beginning, end and rate of bleeding should be noted. For arranging measures which are to determine the sex of the child, on the strength of one of the theories concerning the maturity of the ovum, such notes are even more indispensable. The menstruation diary gives more conveniently and easily the essential facts for the days of ovulation, and makes clear the cycle in which the processes of maturity run in the woman's sexual organs. If, in addition, by the observation of a certain intermenstrual pain, and by taking her temperature regularly, the woman can make it far easier for the doctor to ascertain the date when a Graafian follicle bursts, or if it is possible for the gynæcologist to ascertain this by means of an examination, then the certainty of these methods in individual cases is increased.

It is only when the time of any particular ovulations is known and also the side from which the new ovum comes, that it is possible to link the foregoing methods with *Schöner's* without further ado. So long as no child has been born in the marriage in question, according to *Schöner*, one cannot yet tell with certainty whether an ovum from the right ovary is male determinant. However, even in a case of this kind, the probability is as much as 66 : 33 per cent. But if two previous births are known, then *Schöner* is convinced the sex of a particular expulsion of ovum can be calculated from the dates of ovulation with 100 per cent. certainty.

Though I cannot quite share the absolute conviction of the father of the theory, yet I will admit willingly that the facts given by him are in favour of it. And as his method is not hampered by likelihood of harm to the mother or future child, and can, besides, easily be combined with other methods, I cannot but recommend it.

In many other methods, one must remember this particular contra-indication of possible injury. For instance, I



would not take the responsibility of advising any experiment in which the generative glands of the husband or wife are influenced by certain actions of rays, perhaps by X-rays, because the risk of uncontrollable damage to the germ is associated with this. On the contrary, people cannot be too urgently warned against experiments of this kind.

However, certain other methods which make an impregnation difficult, and thus increase the probability of begetting a boy, can be utilised without there being any risk of bringing a sickly or diseased child into the world by damage to the fertilising spermatozoon. As measures of this kind, we have already mentioned: putting off procreation to one of the last days before menstruation (which was recommended already really with regard to the state of the ovum at this time, but which can be effective also in the way meant now); depositing the semen away from the os uteri at the vaginal orifice; arranging the act to aim at procreation after an emission has taken place a short time before. *Lenz*, the eminent biologist, likewise recommends these measures for this purpose, so that it may be generally agreed that they cannot harm the future child.

Also the change and gradation respectively in the reaction of the vaginal contents appertains more or less to this group of methods. *Lenz* thinks greater dilution of the lactic acid can be recommended as a harmless means of impeding secretion: "as this is also present normally in the vaginal secretion in the last weeks before menstruation." He advises, viz.: "that women who want an heir should have a douche with warm water made distinctly acid with lactic acid before cohabitation." Now it is interesting that *Unterberger*, as we saw above, gives just the opposite advice for the same purpose, namely, that of changing the vaginal contents to weak alkaline. However, it is only an apparent antithesis, for the alteration of their surrounding circumstances may very well have the same, or at any rate a similar, effect on the spermatozoa in both cases. Now, as *Unterberger*, the gynaecologist, is able to record a very great number of practical results, whilst the biologist quoted had



no opportunity of testing his advice in practice, I am of opinion that it is best to use the method of making the vaginal contents slightly alkaline.

*Unterberger's* prescription to a great extent falls in with the consideration that no harm of a serious kind should come to the spermatozoa. A clumsy use of it cannot attain its object. If an indefinite and profuse quantity of sodium bicarbonate is added to the genital secretions, then, as in all the methods previously quoted, if they are used unintelligently, the result is that pregnancy is not achieved at all. Therefore, in *Unterberger's* method, it is necessary for the doctor to ascertain the extent of the lactic acid content of the vaginal secretion, and what the reaction of the semen is, so that only just as much sodium bicarbonate is added as is necessary for the restoration of the desired alkaline content. The bicarbonate of soda importation has to take place a short time before copulation. A vaginal douche, such as women often have in the morning, would no longer have any effect in this respect in the evening. *Unterberger* recommends as the best method of application that the husband dust the glans penis with powdered bicarbonate of soda, but uses only just so much that there is a slight touch of powder on the mucous membrane. With this method of application, *Unterberger*, in long years of observation of mothers and children, has never seen any harm done, and this is all the more significant as his observations to some extent go back for ten or twelve years.

For the case where the examination of the vaginal contents and seminal substance shows the composition more than normally alkaline, whilst, at the same time, the couple tend to have girls, an experiment with the vaginal douche containing lactic acid, as *Lenz* recommends, seems to be suitable. In this, however, the acid content should not be too weak for, in my opinion, with the purpose in view here it would at least have to correspond to the lactic acid content which the vaginal secretion shows a few days before menstruation (about 1 per cent.), perhaps even exceed it a little, the latter particularly when the husband's seminal fluid has a strong alkaline reaction. That is to say, an



accurate examination of the male and female secretions must precede an attempt to attain the object in this way. It would be best to determine experimentally in each case the suitable lactic acid content of the solution to be used for the vaginal douche.

To promote procreation of a girl, it seems to me best for the acid conditions to be restored at the time of ovulation and shortly afterwards, that is, about midway between two menstruations (about 2 per cent. lactic acid) yet, in this case too, we have to act according to the reaction (degree of alkalescence) of the seminal fluid.

On the whole, knowledge and practice certainly have not yet said the last word on regulating the reaction of the vaginal contents for the purpose of determining the sex of the child; nevertheless, we have in *Unterberger's* method an expedient which is worth using in suitable cases when it is a question of promoting the prospect of the birth of a boy.

Having now explained and discussed in the foregoing the various assumptions and possibilities in the first place *theoretically* and then on the basis of my combined accessory-assumption, in order to review them again in a shortened form with regard to their practical utilisation, let us now in conclusion summarise the most important measures which can be used with prospects of success.

In order to promote the procreation of a boy, then, might be recommended:

(A) Determination of the ovary which furnishes an ovum this time and, if this happens to be the right ovary, try to have the impregnation in this month. If by reason of previous confinements the sex-succession in the ovaries can be calculated according to *Schöner*, then this calculation may be taken as basis.

(B) Postponing the sexual intercourse destined for the impregnation to the first nine (or seven) days after menstruation, or to the last days before the next menstruation, which, with a four-weekly cycle, is equivalent to the twenty-fourth or twenty-fifth day after the preceding menstruation.



(C) The coitus which actually impregnates may not take place till after great sexual efforts of the husband, which, however, should be preceded by eight to ten days of continence.

(D) Carrying out the copulation in such a way that the semen is not deposited near the orifice of the uterus but at the beginning of the vagina. Special consideration for the orgasm in the woman.

(E) Making the vaginal contents slightly alkaline (after accurate determination of the acid content) by douching the vagina with a solution of sodium bi-carbonate shortly before copulation, or by slightly dusting the penis with bicarbonate of soda.

(F) Temporary change of diet for a time before and after this conception, and in the direction of a natural somewhat restricted and tone-changing diet for the wife. The husband, too, may prepare himself similarly for the act of fecundation.

(G) In particular cases, a change in constitution by way of the endocrine glands, under the direction of a specialist, might also come into consideration. In this direction the result of the use of certain medicinal springs may possibly be useful.

(H) As an accessory measure in the case of couples who can change their dwelling place, the procreation may be planned in the late summer at a higher altitude. The accompanying change in the mode of life and climate may act in the desired direction.

To promote the *procreation of a girl*, the following advice would have to be given :—

(A) Determination of the ovulating ovary according to *Schöner*, and endeavouring to achieve impregnation at the time which appears suitable according to the formula.

(B) The sexual intercourse destined for conception is to be postponed to the fifteenth–twenty-second day after the commencement of menstruation. With a four-weekly cycle, the fifteenth or sixteenth day is best ; with women whose cycle lasts a few days longer, the eighteenth to twentieth day.

(C) Sexual abstinence from the commencement of menstruation till the day chosen for conception.



(D) Carrying out copulation in such a way that the semen is emitted as close as possible to the os uteri.

(E) Control of the vaginal contents as regards lactic acid conditions, and, when necessary, restoration of the contents to the normal at the time of ovulation. In this the degree of alkalinity of the seminal fluid must be taken into account in the sense that, if this is above or below the normal, the amount of acid in the vaginal contents must be altered accordingly.

(F) Change of diet and metabolism respectively in the direction of an increase in the blood sugar.

(G) and (H). In cases in which a special tendency to the birth of boys is shown, a further change in constitution or change in condition by measures directed by a specialist (such as influencing hormones, change of climate, and in particular the numerous specifics of *Aschner's* constitutional therapy) comes into consideration.

Thus we see that it has been possible to work out without too great difficulty a practical procedure for the arbitrary selection of sex, based on the combination of various theories which give evidence of their right to exist, and especially on the results already got by them, and increasing the probability of success considerably by adding to it several very hopeful expedients.

To be sure, it might be objected to these many expedients that the great miracle of procreation is robbed of its charm by them. But in cases where the desire for a child of a particular sex has become intense, matter-of-fact questions are involved all the same. Meanwhile, the desire itself may take various directions—as in many races it is regarded as a downright disgrace or misfortune to get a daughter, and, on the other hand, in other races sons are unpopular because girls bring wealth and prestige. Besides, in the arbitrary selection of sex (which, as I have already pointed out previously, is, moreover, reserved for those parents who are really willing to take pains for it), a too one-sided preference is not to be feared, as the majority of parents are just as glad to get a child, whether it is a boy or a girl. As a



gynæcologist, I have found often enough that fathers and mothers who wanted a child of a particular sex, after a birth which did not turn out as they wished, got over their disappointment in a few minutes. Afterwards, the joy was all the greater if the child they wanted arrived the next time.

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## SECTION TWO

# IDEAL BIRTH WITH REGARD TO THE MOTHER—HOW TO GET CHILDREN IN THE BEST WAY

## CHAPTER VI

### FAVOURABLE AND UNFAVOURABLE CIRCUMSTANCES BEFORE PREGNANCY

How does a woman prepare for pregnancy ?

Although our treatment of ideal birth for the child in the first section of this book was greatly influenced by hereditary biological considerations, yet I must again stress here the importance of heredity and the hereditary predisposition. We have already given full attention to it in the discussion of the choice of a partner in marriage, as well as in my book, "Fit or Unfit for Marriage," yet we are obliged to turn to this question again now. In doing so, of course, I am taking it for granted that the woman reader has chosen a healthy husband who comes of a healthy family, and consequently confine myself to showing here what hereditary factors are of importance for a woman as regards her pregnancy and delivery.

Even without precise knowledge of the reasons why, almost every wife will ask the question : What sort of pregnancies and child-births did my mother and other female relatives have ? It is not mere curiosity makes her ask such questions, but an instinctive divination of conformance with certain laws. For it is continually being shown that the same difficulties, or even the same surprisingly favourable circumstances, occur repeatedly in the same family.

To deal with all the questions and problems indirectly



connected with the hereditary factors which come into consideration here would take us too far. I will therefore confine myself to those which have a direct influence on pregnancy and parturition, or become manifest at delivery or immediately after.

Let us consider, first, the hereditary conditions with regard to the pelvis. As everyone, although he has only a very slight idea of the structure of his body, should know, the pelvis is the broad annular bony frame which, when walking, is supported by the legs and carries the vertebral column, and hence the whole upper part of the trunk. The pelvis is specially important for women, because the child which develops in the uterus above the pelvis has to get through this bony, comparatively stiff and narrow ring. It is clear that this can only take place when the proportion between pelvic ring and child (and in particular the biggest and hardest part of the child, its skull) is normal. That is to say, the pelvis must not be abnormally narrow or the child's skull too big or too hard. Now a narrow pelvis can be acquired either by rickets occurring in childhood or it can be inherited. The size of the pelvis, according to the well-known investigator, *Fritz Lenz*, is essentially a racial characteristic, a fact that is obvious at once to anyone who visualises the difference in the outward appearance of races. The broadest and hence, generally speaking, the roomiest is the pelvis of the Nordic woman, particularly in the maritime countries on the North Sea and the Baltic. Yet in parturition, the absolute size of the mother's pelvis is not the decisive factor, but the proportion between the mother's pelvis and the child's head. Hence—leaving out of account the considerable degrees of pelvic contraction—the difficulty or easiness of a delivery can in this respect be foretold better from a consideration of the parental skull than from the measurement of the maternal pelvis. Every experienced gynæcologist has experienced bitter disappointments in this. He who wants to ensure success should get the head measurements of the parents when new-born babies. In Germany the midwife is obliged to take this measurement. But as she attributes no further importance to it, this is very often



forgotten, and is frequently not communicated to the parents, who should add it to the records of their child for future family information. I hope these explanations will in time move young mothers to make a note of the head measurement of their children, and hand on the information when they too marry.

From what has been said above, it can be understood at once that where there is a mixture of races between the parents, in the expected child the natural adaptation of the foetal head to the maternal pelvis does not take place without difficulty. In fact, in people of mixed race, the necessity for gynæcological interference occurs much oftener than with pure-bred people.

In many cases, too, the predisposition to easy and difficult labour, to complications such as presenting placenta and other disturbances of the process of labour, even the premature rupture of the foetal membranes, seems to recur not infrequently in mothers and daughters. The family tendency to threatened hæmorrhages in the third stage of labour, and during the first hours following, is of particular importance. I know a case in which the tendency appeared through four generations. If there have previously been difficult confinements, or remarkable secondary hæmorrhages in the direct line and the collateral line, it is wise to face the possibility of difficulties recurring and to draw the doctor's attention to this. Likewise, diseases, the predisposition to which only is transmissible, may be stirred to life during pregnancy. Thus it has occurred in the case of two sisters that both had irritation of the cæcum in their first pregnancy. Also the occurrence of tuberculosis in pregnancy in mother and daughter, both healthy previously, is not too rare an occurrence. The actual anomalies of pregnancy, such as disorders of the kidneys, varicose veins, etc., often show hereditary or family characteristics. Fortunately the predispositions mentioned are not of a nature to make marriage out of the question, but people should understand that they occur and then take precautions.

A further point worthy of particular attention is the state of the internal genitals and particularly the uterus. Mal-



formations and, above all, states of underdevelopment of this organ are comparatively common. In pregnancy and in labour—if it comes to this, because in such cases the foetus is generally expelled prematurely—they give rise almost without exception to difficulties. On the other hand, they can often be put right satisfactorily by timely treatment. The demand for premarital examination of the conditions of the organs in question is derived from these two facts.

In addition to the factors mentioned, the age of the parents plays an important part. The age of the father is of less importance than that of the mother, for, on the one hand, no demands are made on his body by parturition; on the other hand, the father has less to do with the rearing of the children.

The age of the mother is more important: there is no doubt that the years between twenty and thirty—all writers agree about this—are the most favourable for child-bearing. For the period of physical and psychical maturing is finished, and yet the body is still so youthful that its elasticity overcomes the physical task of pregnancy and labour as easily as possible. The psychical closeness of the young mother to her own childhood will make it possible for her to take lightly the psychological tasks which the training of her children will impose on her. There is a certain danger in being too young, for any excessive strain on the organism before maturity is completed may, in some circumstances, have harmful results. And to be in a position to become a grand-mother at thirty-five years of age is a situation which not every woman is equal to.

From the age of thirty onwards the obstetrician speaks of an "old primipara," and thus gives expression to the thought that his attitude to this in advance is that in a confinement at this age difficulties may possibly occur. For a woman to give birth to a second or later child at a late age has no importance for the prognosis (prediction of the course to be expected) of a delivery, for the first confinement will always have prepared the body so far that, unless there is too long an interval between, it remains equal to its task.



Whilst one sees few difficulties in a confinement at a youthful age, and the scruples in this case are chiefly psychological, it is different for the older woman. In this case, the tissues, harder, less dilatable and deficient in water, often offer a resistance so strong that serious interference with labour and injuries both to mother and child may occur. The young mother has, as a rule, to suffer less with troubles of pregnancy than the older one; the elasticity of her tissues is so much greater that the duration of labour is shorter. Statistics show about double the number of hours for the oldest primiparæ compared with young primiparæ.

In my opinion, however, there is no decisive reason for an otherwise healthy woman over thirty or even in the early 'forties, to give up having children because of her age. She must just understand from the first that there may be certain drawbacks, perhaps even difficulties, and consequently must make specially careful preparations; have her confinement in a hospital; in any circumstances consult a doctor even during pregnancy, and, of course, for the delivery.

I have stated this because I know that, owing to the difficult economic conditions of the last decades in most civilised countries, the marriage age of women has been raised, and hence the average of primiparæ has become higher than formerly. In spite of this, however, statistics with regard to the chances for the mothers and the dangers for the children are by no means bad. With well-qualified management of delivery, the mothers are in no great danger, although Nature is not always in a position to carry out alone the work begun, and obstetrical interference and assistance may be necessary more frequently than with young women.

The difficulties are caused for the most part by the deficiency in flexibility of the soft parts; how far the joints and ligaments which connect the pelvic bones with one another and the bony pelvis itself share in this want of flexibility is not yet clear. That in pregnancy, under the influence of the general hormonal and local changes in circulation, as a rule a loosening of the pelvic joints takes



place, is well established: the importance of this loosening is comprehensible even to laymen. Whether with old primiparæ the joints loosen less is not certain—it is conceivable and not improbable. The bony pelvis, especially in the case of young mothers, certainly does not reach its full development till pregnancy—an observation which is made not only by doctors but also by dressmakers.

It is supposed by some doctors that women who have kept their bodies youthfully agile by work, sport and gymnastics and equal to physical demands have better chances in late confinements than those who lead sedentary lives. This is a very plausible theory but one which is so far supported only by impressions, and has still to be proved. In any case, this theory holds good only for the life *before* pregnancy—as, of course, we have kept in mind in this chapter—for *Kästner* has proved by thorough investigation that women who have done heavy physical work up to their confinement on an average have more difficult labour than those who have been able to take things easy in the last six weeks.

The conclusion to be drawn from what has been said here with regard to the age of primiparæ is fairly simple: Youth—although not too great youth—is to be esteemed a more favourable condition: a very advanced age is less favourable, yet not so unfavourable that a pregnancy would have to be advised against on this account. People should take care to have good guidance and good assistance. And it is best not to put off marriage and the first pregnancy too long.

Also the state of the woman's health, her constitution and complexion are of more or less favourable or unfavourable importance. By complexion is meant that part of her constitution revealed by the colour of the hair and the skin. Its effect with regard to many functions, in particular the generative processes, is specially interesting, although not yet sufficiently studied. Red-haired women seem more exposed to danger than others, yet no doubt, as a result of the excessive sensitiveness of their skin and mucous membranes to light, cold and infection of all kinds, and also in pregnancy and lying-in, they show a comparatively high



rate of illness. Fair women, too, show comparatively great sensitiveness in their mucous membranes, and have more often than brunettes a tendency to the disturbance in development of the sexual organs called infantilism, of which I have just spoken. Dark-haired women show a greater tendency to tumours, pseudo-tumours and disorders of metabolism, and for the last-named reason have to suffer more frequently from violent pregnancy-vomiting.

Still more important than the complexion for the prospects of the course of pregnancy and labour is the general constitution.

Delivery proceeds most easily in the case of the woman with the so-called rounded youthful figure (the individual of *pyknic habitus*, woman in the fullest sense of the word); with her the tissues are flexible and elastic and labour proceeds quickly.

The "hypoplastic phenomenon," that is, the woman more or less retarded in her general physical development, has a difficult labour—her confinement lasts longer, causes more pain and more often leads to lacerations of the soft parts. However, the too strongly developed female body, too, the tissue of which is very firm and strong, may be exposed to disturbances in the course of labour just because of this great firmness, and internal lacerations may result from the insufficient dilatability of the genital passage.

With the intersexual type, the woman of strongly male appearance or too slight female accent in her physical structure, as regards the capability of child-bearing, two types can be differentiated. In one the sexual organs are normal; she bears children easily. In the other the female organs are retarded in development; she is often barren, and if she does conceive, has a tendency to disorders.

The importance of the bony pelvis for labour has already been pointed out; it is clear, however, from the last arguments that the soft parts are almost more important. The obstetrician speaks of the woman with flexible fibres and contrasts her with the woman with rigid fibres. The latter, whose muscles are rigid and inflexible, opposes great resistance to the passage of the foetal head, and thus makes



labour difficult. She must learn by gymnastic exercises so to control her muscles that they can not only be braced at will but also slackened—let loose. Any woman can by exercises such as I have described in another place acquire this control of her muscles, and make labour easier by arbitrary activity of the muscles concerned in it, especially by loosening the muscles of the pelvic floor.

For a pregnancy free of troubles and a successful labour, not only general good health but also absolutely sound sexual organs are necessary. Maladies and disorders in the functions of the sexual organs should, even if they are not caused by actual diseases of the genitals, be cured before a pregnancy begins. This is true, especially for discharges of all kinds as in catarrh and inflammation. Inflammation of the ovaries and affections of the uterus give grounds for postponing pregnancy. If this is not done then there is, on the one hand, the risk of miscarriage, and, on the other, the patient is threatened with infection arising in child-bed or after miscarriage.

The condition of the breasts and suitable care of them from youth up is also important. It has been ascertained by statistical inquiries in lying-in hospitals that almost every woman can suckle. How long this is possible, and to what extent, is dependent on factors which we shall deal with in another chapter. The breast itself is first developed fully in pregnancy, so that it is difficult to speak with certainty beforehand of the prospective capability of suckling. In general, it is not the fatty, big and heavy breast which proves most productive but the medium-sized, firm one; we find, however, even in women whose gland tissue is obviously under-developed, that they can suckle quite well. The breasts should, of course, be adequately supported. But pressure on breasts and nipples, such as is exerted in certain fashions, by too narrow bust bodices or intentionally, is always harmful, and may prevent the gland tissue from developing sufficiently.

Preparation for motherhood should really begin when girls are quite young. In their case, the prevention of all diseases



which hinder normal development is still more important than with boys. I am thinking here first of all of rickets, which represents a disturbance of development affecting the structure of bone. It is particularly serious for girls as it may cause contraction of the pelvis, which proves to be an unfavourable condition in labour. It has been ascertained that rickets is due principally to deficiency of vitamins and can be prevented by supplying vitamins in the form of fresh fruit, vegetables, butter, milk, light, air and sun (also artificial sunlight), as well as by giving lime. Then, even the very young child must be trained to the greatest cleanliness as well as regular evacuation of the intestine and bladder. Gymnastic exercises, easy games and play in the open air, should keep the body supple and bring it to correct development. This holds good for any age.

At the time when puberty is beginning, girls must be taken care of more than before, especially during menstruation. There must be a regular alternation between work, rest, exercise in the open air, light, sport and gymnastics which gives a constant stimulus to growth, and yet, at the same time, avoids over-exertion. I believe that in this period of life, during the days of indisposition, too much rest is better than too much activity. Later, when the body is fully matured, any troubles still in existence can more easily be ignored than while the organism is growing. The widespread fear of washing and changing underclothes during menstruation is quite unfounded. On the contrary, in these days an unusual amount of waste matter of metabolism is eliminated not only with the discharge of blood but also through the skin, the removal of which by washing the whole body, and especially washing the genitals with lukewarm water, is absolutely necessary. This is necessary not only as a hygienic measure but also to get rid of unpleasant odours.

About the clothing the following may be said: light clothing which admits much air is beneficial to the body, yet it is necessary to beware of exaggerations such as the fashion of exposing the knees gave us a few years ago. In winter, not only the body but also the legs must be pro-



tected from cold, as not only rheumatic affections but also catarrh of the uterus, the vagina, and particularly the bladder are caused by the coldness going up, and the increase in these troubles during certain freaks of fashion is too marked for there to be any question of chance. *Abel* assumes that the increase in thrombosis and embolism, which was discussed even in the daily papers a year or two ago, is also caused by the altered conditions of circulation which occur as a result of the legs being thoroughly chilled.

The question of shoes is always a thorn in the flesh of the obstetrician. In spite of pain in the feet, corns and pains in the back, most women like themselves so much in shoes with high heels that everything said against them from the medical side seems to go in at one ear and out at the other, and at best, gets consideration only in the last months of pregnancy. I sometimes wonder if the fashion prevailing at the moment for low heels on street shoes really can be regarded as the result of the medical warning? It would be almost too presumptuous to suppose so! Nevertheless, it must be repeated once more that low heels are an important preliminary condition for the genital health of women, and is particularly important in the years of puberty. The bad carriage due to high heels creates altered conditions of circulation, and may cause aberrations in the menstrual cycle.

Sport is, in general, important for women's bodies, and good so long as it is not practised to excess. The body is strengthened and prepared for the tasks of maternity by the better development of the muscles, better breathing technique and better circulation. At the same time, however, kinds of sport which develop too stiff muscles are to be avoided as far as possible, or indulged in only within moderate limits. According to *Sellheim*, this is true particularly of ski-ing, but then, too, only in excess, as after all no sport can be absolutely rejected except motor cycling. All other kinds of sport can be practised by women without danger, if done within reasonable limits. My view certainly is that, generally speaking, it should be stopped during menstruation. It may not do any harm, but too much importance cannot be attached to the danger that harm may



be done by over-exertion, a fall or a real accident. Owing to the profusion of blood in the abdominal organs during menstruation, even with slight shocks hæmorrhages may occur in the ovaries and bring a wearisome time in bed.

Properly conducted gymnastics, because they are capable of being regulated, are more advantageous for the female body than sports ; yet I willingly admit that the latter have other, particularly psychical, advantages so great that we may on the whole regard the conquest of it as a big plus for women.

In contracting a marriage, besides the hereditary health, the personal health of the wife, and of the husband as well of course, is of importance. Where the health does not come up to the medical requirements, the question of postponing the marriage or the first pregnancy should be submitted to the family doctor, or perhaps to a competent specialist. The same holds good for the second and every successive pregnancy if illness has occurred in the interval. Also a certain period of forbearance for restoration and recovery between two pregnancies should, as a rule, intervene. What measures are suitable for this in the individual case must be decided in consultation with a gynæcologist if occasion should arise. I should like to point out here, however, that the female body changes and develops, and therefore a change in treatment may be expedient, especially after a confinement has taken place.

Any injuries of the female body caused by a delivery should be put right before a second or further pregnancy occurs ; in particular, the elasticity of the body should meanwhile be restored by suitable gymnastics. To discuss other measures at this point would be going too far, but I urgently advise a thorough medical examination at the end of the nursing period and before a fresh pregnancy.

The existence of chronic affections of the heart, lungs, kidneys and stomach need not necessarily be a reason for avoiding pregnancy : certainly the decision in this case is to be given only by careful observation and joint examination by the gynæcologist and the family doctor. Should



pregnancy set in against medical advice, then there must be very careful deliberation before the question of an interruption is taken into consideration, for it has been shown in innumerable cases that the woman's desire for the child can be stronger than the difficulties opposed to it. Besides, an interruption of pregnancy is not at all a harmless interference; the most serious damage to the sexual, psychological and general health of the woman may arise from it.

The most favourable preliminary conditions for pregnancy are provided mainly by the woman herself. She should care for her body from earliest youth by the greatest cleanliness, proper food, clothing and exercise. The main issue in all these questions lies in careful use, proper apportionment, and in moderation. Certainly, maternity when comparatively young is to be pronounced most favourable on physical and psychological grounds; but, where this is not possible, the doctor is to be called in to advise and to help.

*Nevertheless, psychological preparation is always necessary and of the greatest importance.* Training in the girl as she grows up should develop the ever-present natural desire for maternity; the virgin should learn to regard its fulfilment as the object of her life, and the woman proceed consciously to the great and wonderful task which Nature has built her to fulfil when she is ready for it. She must, however, always keep in mind that the welfare of the family and the nation depends on her health and her responsibility, and that her body is entrusted to her as a sacred possession.



## CHAPTER VII

### PREPARATION FOR BIRTH DURING PREGNANCY

#### *Hygiene of Pregnancy*

BY metabolism we mean the co-operation of the various organs of the body, the circulation, organs of respiration, digestive apparatus, the various ductless glands and the excretory organs. In it everything is very finely balanced, and yet has a great power of adaptation to special services and special demands.

Pregnancy makes such a demand on metabolism, which has to be extensively rearranged because it has to satisfy other and increased demands.

Practically speaking, the changes in the body set in as soon as the fertilised ovum has embedded itself in the uterine mucous membrane made ready every month. In the whole body additional forces are now made active, the exception-condition is, as it were, declared by the chief management. The uterus upon which the greatest task devolves begins to enlarge, and that by increasing both in mass and in length. Every single muscular fibre is extended in the course of the ten lunar months to from seven to eleven times its length; at the same time, however, it increases about three to five times in thickness; in the spaces between the muscular fibres, globules of fat become embedded, the task of which probably consists mainly in nourishing the muscular tissue of the uterus operating during labour. The uterine wall reaches its greatest thickness in the fourth to fifth month, viz.,  $2\frac{1}{2}$  cm. From then onwards it expands and, at the end of pregnancy, is about  $\frac{1}{2}$  to 1 cm. thick, thinnest at its uppermost part. Between the muscular fibres there is connective tissue and elastic supporting tissue, which, likewise loosened, permeated with tissue, fluid and fat, shows a great power of expansion.



The growth of the blood and lymph vessels corresponds to the growth of the muscles, for not only this greatly increased volume of uterine tissue but also the embryo growing within it has to be nourished, and it has to get rid of waste matter. The individual blood vessels increase in bulk and length, indeed they are even to some extent made sinuous in order to be able to supply more vital substances to the surroundings by having a larger surface. Yet the nourishment of the embryo takes place solely through the umbilical cord which runs into the placenta. The placenta is a kind of sieve ; it draws from the inner wall of the uterus, to which a wide surface of it is fixed, all the important substances for the child, and seems to work them up in some way or to influence them by its action (the placenta also has the functions of a ductless gland).

As a matter of course the ligaments which support the uterus and keep it in its place likewise increase in size and strength, and undergo involution after pregnancy is over. The ovaries, too, after the expulsion of the ovum, have not yet finished their task ; it is true they increase only a little in size, but the corpus luteum which has formed in the ovary in place of the now fertilised ovum is not only retained, but develops for some time longer and exerts an influence, not yet explained in every respect, on the growth of the ovum. The corpus luteum is no doubt also a ductless gland, the chief task of which probably consists in protecting the embryo. At any rate, if it is removed, a miscarriage takes place. After the first months, however, an involution of this corpus luteum occurs, and its protective activity is apparently taken over by the internal secretion of the placenta.

The placenta does not perform functions of a ductless gland only ; it also acts as lungs, digestive apparatus, and kidneys for the growing child, whilst it carries out the interchange between maternal and foetal blood.

The outer sexual organs, too, show early changes so characteristic that these, to the doctor's eye transient symptoms, are to a certain extent used for the diagnosis of pregnancy. The labia increase in size, they seem "swollen"



without any discomfort being attached to this swelling, and, at the same time change colour to a darkish blue, because here, too, in preparation for the necessary dilation in parturition, the blood vessels expand and become sinuous. Owing to this, actual varicose swellings occur in the later months and often seriously but unnecessarily alarm the women who have them. A similar process goes on inside the vagina. The vagina walls expand and thicken just in the way we saw in the case of the uterus, for the organ which, in young girls, is a narrow passage, has to enlarge so that it gives space for the passage of a child's head about  $9\frac{1}{2}$  cm. in diameter and 32 to 35 cm. in circumference. Because of the slackening and dilation, the vagina is during pregnancy less capable of resistance to injurious influences than at other times. Its walls give way more easily to a great strain so that a very full bladder, or long continued walking and standing with insufficiently supported abdomen, may produce symptoms of sinking or, at any rate, the sensation of such symptoms. Also the vaginal mucous membrane is now much more permeable, and offers no resistance to any medicaments introduced. For this reason, if any douching has to be done by order of the doctor in this period, only quite mild and non-irritant specifics should be used. The fact that in pregnancy with many women the vagina secretes a certain amount of a cloudy whitish fluid is due to the greater looseness and permeability of the tissue, and is no reason for douching unless medical examination, which ought never to be omitted in cases of this kind, finds some morbid disorder.

Also the remaining organs of the body undergo a change. This is particularly marked in the skin, which changes colour and becomes thicker. In the face, the median line of the abdomen, the skin of the abdomen itself, on the breasts, particularly the nipples and the areolæ of the nipples, in the armpits and the outer sexual organs brownish discolourations may occur. Further, white lines (*striæ*) form in the skin, particularly on the abdominal wall and the breasts. Also the covering of hair may increase; many women have a slight formation of down on the face and



abdomen in this period. The secretion of sweat, especially in the last months, is greatly increased on the abdomen, the breasts, between the legs and in the small of the back. The subcutaneous connective tissue is as it were more transparent, so that the superficial network of veins is more prominent and may be of value as signs of pregnancy.

Whilst a certain emaciation not infrequently occurs in the first months, after the middle of pregnancy, the figure becomes fuller, the appearance more blooming, the conformation of the body stouter and the gait heavier. This is caused to some extent by the greater deposit of fat on the front and sides of the abdominal wall, the hips, breasts, thighs, neck and face, hands and feet. In women not yet fully developed, a growth of bone may occur, especially in the hands and feet, which is made noticeable by shoes, gloves and rings becoming too small.

Most young wives notice very soon after conception, even before the first absence of menstruation, a certain tightness or increase in size of the breasts; very soon, too, a drop of fluid comes out of them if light stroking movements, in the direction of the nipples, are made. In later pregnancies, of course, this secretion appears more quickly than in the first one. The breasts swell as a result both of a development of the glands contained in them and by the deposit of fat. The colour of the nipples and their areolæ becomes darker, white lines, as we have already mentioned, appear in the skin of the breasts. Like the muscular substance of the uterus, the abdominal wall also gets bigger; the whole tissue becomes besides slackened and expanded, and consequently also much more sensitive. About the middle of pregnancy the navel becomes obliterated. The abdominal muscles act differently in different women. They may be very stiff so that the abdomen scarcely needs any further support, but they may also be very slack and give way in the middle. In the latter case sometimes, especially if a considerable layer of fat is also present, a tendency to pendulous belly may easily develop, which must be kept in check by a suitable abdominal binder. To counteract the weight of the growing uterus, and make the upright carriage possible, the muscles of the



back become stronger. The whole body inclines backwards, so that the dress may appear too short in front and too long behind.

The blood and blood-forming organs become more active, the capability of coagulation of blood is increased, and the amount of blood towards the end of pregnancy considerably enlarged, by which is explained how the relatively great loss of blood in parturition is borne without harm.

Of the ductless glands, besides those already mentioned, we must refer to the pituitary body, which increases to two and a half times its size. Without its action, labour could not come into operation at all. The changes in the frame already mentioned, as well as the greater tendency of pregnant women to sleep, are ascribed to the increased action of the pituitary body. Meanwhile, the action of most of the other ductless glands also undergoes a certain change.

From these brief remarks it is clear without further exposition, that the female body in the condition of pregnancy is in a state of very great change.

After having discussed these preparations of Nature we shall now give our attention to intentional preparations for child-birth. Here, however, we can only give general directions just because these directions are in no way to take the place of a doctor, but, on the contrary, are meant to show how necessary medical supervision and advice are in this period.

One of the most disturbing troubles in pregnancy is the sickness which may come to vomiting. This vomiting may be due to a self-poisoning of the body as a result of the changes taking place in metabolism, and require medical attention. As a rule, however, it can be checked by harmless remedies ; in most cases, even smelling salts and peppermint are sufficient. Where these home remedies do not avail, the doctor must be called in to make certain that there is no question of a serious disorder. Very often the nausea disappears if the doctor raises the somewhat displaced uterus pressing on the intestine, or prescribes a slight sedative. Oftener than is supposed, however, there is a



psychical cause at the bottom of the sickness, so that it is most effectively checked by way of the psyche. For the subconsciousness determines not only our mental but also our physical reactions in unexpected ways, and hence a psychical revulsion of feeling is at the bottom of many physical troubles. Such a revulsion of feeling can be found out and removed by way of analytical psychotherapy. This, however, generally takes too long for the circumstances in mind here, with the exception of those cases in which the "active" method is successful in a few meetings. Moreover, a procedure of this kind is not absolutely advisable in pregnancy, as becoming conscious of complexes is at first not always conducive to a feeling of wellbeing, and psychical harmony is particularly important for every woman at this time. We willingly admit that the aim of psycho-analysis is precisely to remove disturbances of this harmony, but the path which it follows is beset with thorns—for the pregnant woman too much so in most cases. Consequently, in cases like these, we recommend milder psycho-therapeutic measures which act more quickly, cure the vomiting in four or five days, and have the advantage that strong medicines, which might have a bad effect on the child, are avoided.

However, the path of the mind should certainly be chosen, not only to check vomiting but also to overcome the numerous troubles, small and great, of pregnancy. As regards this the woman herself can do a great deal. People have again had their attention drawn to the efficacy of auto-suggestion by *Coué*, to whom ten years ago sick people from all over the world made pilgrimages. It would be out of place here to try to explain the theoretic foundations for the formula: "Every day in every way, I am getting better and better," but there is no doubt whatever—in spite of the absurd uses it has been put to—that used properly it does give help, and that it can be beneficial if there are no organic changes in question. The danger of employing it consists in this, that by auto-suggestion people may for a time be deceived about actual symptoms of disease, and thus time valuable for the necessary medical treatment be lost. Beware of this danger, and do not omit a medical examina-



tion by supposing that where troubles appear it may be a matter of "imagination" which can be dispelled by self-command. What has been said of the, we may say, primitive method of *Coué*, is still more true of all those methods of mental training by which the adherents of certain doctrines have so trained themselves by means of concentration of thought—as a rule allied to breathing exercises of a special kind—that the body and physical sensations are to a very great extent brought under the dominance of the mind. To show how far this can go, I need only call to mind the adherents of the Indian Yoga doctrine, who can make their bodies wholly insensitive. Various doctrines which are comparatively widespread in Europe and America, such as, for example, the Mandaznan doctrine, also advocate the principle of mastery of the body by the mind. Finally, modern psychology, too, is concerned with acquiring mental control over the body by concentrative self-relaxation ("Autogenes Training," according to *J. H. Schultz*, and "Progressive Relaxation," according to *Edmund Jacobson*), and psychotherapy is beginning to make use of what can be done in this way. I am convinced of the great value which the autogene training can do for pregnancy and particularly labour, but must at the same time emphasise that it is suitable only for the spiritually elect. For these, however, both physically and as well as because of its psychical value, it will be of the greatest use.

Every woman in the condition of pregnancy, in which so to speak she pays heed to herself and finds herself physically and mentally in a state of change, is readily accessible to strange influences. She should therefore be careful to expose herself only to beneficial influences. Good books, fine works of art and good people can contribute a great deal to good health and inner harmony. It is the husband's duty to help her in this—not always an easy task, it must be confessed, and one which unfortunately is only too often left undone—a task, however, the fulfilment of which is a human and male duty, as well as a privilege. Just at this time the husband should show his wife what she means to him. He should cheer her up, keep her bright and confident, see



that she has suitable diversion—in short, show her his unselfish love. The people about her, and particularly the doctor, can make use of this lighter influence for good and—so far as is necessary—give the wife an indication of the greatness of her task as the mother of a rising family. Everything harmful must consciously be avoided, especially as regards the outlook for the coming confinement. It is quite certain that more difficulties have been overcome by peace of mind and confidence than by the more popular fashion of cultivating an excessive and often unfounded dread of child-birth. A pregnant woman should never be told tales of horror, and the tales of difficult labour, still so popular with many women, are specially to be avoided. If difficulties are really to be expected, it is sufficient if the doctor is quite clear about them, and tells the husband about them beforehand, so as to exonerate himself afterwards should occasion arise. The woman herself need not know, and having followed the doctor's orders, her peace of mind and the equable breathing and heart action resulting from this may help to overcome even considerable difficulties. There is only one excuse for "giving a scare," and that arises if carelessness and obstinacy cause disregard of all precautions and advice!

The hygiene of pregnancy must naturally extend no less to the physical side. The greatest possible cleanliness is the chief injunction here. Midwifery owes its success not to belated killing off of germs but to preventing them from getting in. Therefore the genitals in particular must be protected from everything harmful, and kept free from germs of disease and decomposition as far as possible by daily cleansing. It is enough if they are cleansed several times daily, especially after evacuation of the bowels and micturition, by washing with warm water and a mild soap; where the mucous membranes are particularly sensitive the cleansing can be done according to more precise orders of the doctor. Douches, unless specifically ordered, are to be omitted. The husband should take special precautions before sexual intercourse by carefully cleaning the penis and all parts of his body coming in contact with the



genitals of his wife. As to how long conjugal intercourse may be continued during pregnancy, opinion is rather divided. With the precautions just mentioned, I see no objection to permitting its continuance till about six weeks before the time of labour is calculated to begin, unless the wife finds it unpleasant. Regard for an accommodation to each other in this, however, will find the proper course better than medical prescription. I will point out, however, that conjugal intercourse in the last months, where there is a possibility of insufficient cleanliness, is decidedly a source of infection, and it has been ascertained by statistical inquiries that with many women who have fallen ill with puerperal fever sexual intercourse had taken place a comparatively short time, *i.e.*, a few days and hours, before the confinement.

In pregnancy the breasts should be cleaned and looked after very carefully. It is better to bathe them with cold water several times a day and to wash the nipples from time to time with warm water and soap, than to apply ointment to keep them supple. I have seen no advantage from brushing, painting with alcohol and so on, but, on the contrary, found that nipples manipulated too much tend more to become chapped than others. The breasts as they become heavier should be supported by a good bust support which does not press on the nipples so that the subcutaneous connective tissue does not split. The muscles which support the breasts may be strengthened by suitable breathing and arm exercises.

The abdomen must be protected in good time, before the muscles are over-stretched, by a well-fitting displaceable corset. There is quite a number of good and satisfactory models; of course a corset of this kind fits best when it is adapted to the individual body; the additional expense is made up for by firmer outlines. Striæ can to a great extent be checked by early, careful massage of the skin of the abdomen, but this should be done only on medical advice and under medical supervision. In my book, "Sex Efficiency through Exercises,"\* I have gone fully into the physical exercises necessary and desirable in pregnancy. I should like

\* William Heinemann (Medical Books) Ltd., London, 1933.



to emphasise here once more, what is specified more fully there, that physical exercise in pregnancy must be adapted to the needs of the individual, and must never cause any particular pains. The most important are breathing exercises, with regard to which I should like to point out the favourable effect of singing both on the respiration and on the state of mind. In physical exercises in pregnancy there should be no attempt at doing one's utmost. If specially violent foetal movements set in after the exercises, it is a sign of over-exertion; properly carried out, the exercises do not cause discomfort but produce at most a pleasant tiredness. I attach great value to passive and semi-passive movements, and a properly carried-out and properly regulated general massage can be decidedly beneficial. It is as a rule also very pleasant for the patient; the instructress or the sister entrusted with this treatment in the hospital must, however, be specially trained for it.

Physical exercises in pregnancy are not only beneficial to health at this period; ultimately the gymnastic training and the control of the muscles attained by it are also a good preparation for parturition. In these, however, it must be emphasised, that the power to relax is of more value than the ability to stiffen, for strongly tensed, cramped muscles of the pelvic floor oppose unnecessary resistance to the passage of the foetal head.

Physical exercises also check the formation of varicose veins which are caused by vascular congestion. In addition, lying down frequently, or at least putting the feet up, is also of use in avoiding congestion in the lower limbs.

We have already pointed out the importance of food, care of the teeth, regular evacuation of the bowels and bladder, in the third chapter. Discomfort for both mother and child arises from non-attention to these fundamental precautions.

Special attention must be given to any illness which occurs in pregnancy. Since a surprisingly great immunity to infectious diseases exists in pregnancy, and the maternal body apparently has a specially great power of resistance at its disposal in most cases, it will be possible with care and discretion to attain the desired end—preserve the life of the



mother and child. In any case, any illness, no matter how harmless it may seem to the layman, requires medical treatment and proper care.

The doctor calculates the pregnancy by lunar months, *i.e.*, at ten months each with twenty-eight days. The confinement can be reckoned as on the 280th day after the beginning of the last menstruation. In the middle of the period, after four and a half calendar months, about 140 days before the confinement, as a rule, the first foetal movements begin to be felt ; women who have already had children generally feel the movements still earlier. From the sixth month onwards the foetal cardiac sounds are quite discernible. Now it is time to think about the preparations for the confinement. The child's outfit is probably already at hand. In providing for the mother it is important to settle first of all the question of confinement at home or in a hospital. First, the doctor must be asked whether he has any objection to a confinement at home. Though no difficulties are to be feared so far as can be foreseen, nothing can be decided yet without all points of view being taken into consideration. The distance from the doctor, midwife and chemist, from the nearest hospital within reach is of importance ; the domestic circumstances, the question of attendants and the lighting and heating. Also the question of expense must be taken into consideration. Generally speaking, confinement at home in moderately convenient circumstances is pleasanter for the woman, because she is then at the centre of events, and the arrival of the new member of the family can proceed with greater pleasure than is possible in a hospital. If, however, the domestic circumstances are limited, if it is not possible to keep worries away from the mother in child-bed and give her some comfort and good nursing, then she is more comfortable in a hospital. For the doctor, a confinement in a hospital with trained and experienced nurses is naturally simpler and more convenient, but this point of view will not decide the matter if he has at heart not only the physical but also the mental welfare of the mother.

The preparations necessary for the hospital are slight ;



a little trunk with the necessary articles of toilet, a few night-dresses, a warm dressing-gown and the child's clothes should be ready a few weeks before the expected date ; the choice of hospital is settled betimes and the necessary arrangements made.

It is different with the home confinement : here everything to the smallest detail has to be prepared with great care, so that when the decisive moment arrives, everything necessary is at hand. First of all, in agreement with the doctor's wishes, the help of a good midwife or monthly nurse, who also will undertake the nursing during the puerperium, should be secured. In many countries, such as Holland, England and America, with better-off patients, the doctor undertakes the confinement with the help of a nurse with special midwifery training ; whilst with the less well-to-do a midwife undertakes to give the necessary assistance by herself, and has recourse to the doctor only if complications threaten. In Germany scarcely any doctor will be found willing to work without the assistance of a midwife. Then it is best for the woman to have the midwife or nurse come to see her one day, so that the necessary preparations can be discussed with her, and that, if occasion arises, she may be able to find her way about at once in the strange house.

A room easily aired and, should the confinement not happen in the warm season, easily warmed, should be chosen as the lying-in-room. In this matter the owners of modern centrally-heated dwellings are sometimes at a disadvantage compared with those who use stoves for heating ; but no doubt in that case it will be possible to get the room at the proper temperature by means of an electric fire. Good lighting is essential. Shaded bedroom lamps are certainly very pleasant for ordinary use, but for managing a delivery we need a bright light so that the slightest change can be recognised at once. This, however, should be so directed that it does not shine in the patient's eyes. The bed should be so placed as to be accessible from both sides. The mattress must project beyond the edge of the bed ; it will be protected by a rubber sheet ; over this comes a clean sheet



and then right across the middle another sheet, which is best separated from the big sheet by a second waterproof layer. Then it is possible to give the patient fresh bed linen several times during the confinement without the bed having to be entirely remade. All the linen (worn old towels can easily be used) necessary for the confinement and lying-in having first been washed should be wrapped in a towel, put into a basket and sent to be sterilised. If this is not possible, then the linen for mother and child should be boiled again, ironed and wrapped in a towel similarly treated and kept free from dust till needed.

If it is possible to have the linen sterilised, then each packet is to be wrapped separately in a towel—a pound of chemically pure cotton wool, masks and towels put in as well, otherwise special arrangements must be made for sterile cotton wool and masks. The big firms which supply dressings, as well as many chemists, keep packages which contain all that is necessary already sterilised.

As disinfectants, we need first of all soap and sterilised brushes for the hands, methylated spirit and a fluid disinfectant, lysol, lysoform, or the like. Further a slipper bed-pan as well as a douche-can or syringe with a rubber tube and two nozzles which can be boiled, all carefully cleaned beforehand and kept free from dust, must be ready to hand.

All dust-traps, heavy curtains, carpets, plush furniture, etc., must be removed and the room thoroughly cleaned. It is good to choose a room with a washable floor, linoleum or boards. Generally, even when labour begins there is still plenty of time for the floor to be mopped and the bed-clothes changed. Two little tables covered with sterile towels which can be used without fear of spoiling the polish are necessary. In addition, washing facilities and two big basins for disinfectant solutions, as well as a refuse pail for used dressing material.

A cot and a bath as well as the usual objects necessary for nursing must be provided for the new-born babe. Finally, let us not forget the clock to show the exact time of birth.



## CHAPTER VIII

### THE CONFINEMENT AND THE WOMAN'S Demeanour WHILE IT PROCEEDS

THE last weeks and days of pregnancy seem to drag on interminably, unless a sensibly arranged occupation of the time makes it easier for the woman to bear the increasing clumsiness of her body. In this period, dedicated to maternity, the cultivation of a healthy and lively mind seems to me almost more important than all the care and attention given to the body. Complaining and impatient women endure the troubles of labour just as badly as the discomfort and waiting of the last weeks. Although everything needed for the child and the confinement should have been ready long ago, so that a possible premature labour does not find one unprepared, yet some kind of light occupation should be provided for the last part of the time.

At the end of the ninth lunar month of pregnancy, that is, four weeks before delivery takes place, the body of the uterus, which in the last weeks had been felt up in the costal arch, begins to descend and to incline forwards. This makes respiration freer again, and diminishes the cardiac troubles resulting before this from the pressure of the intestines on the diaphragm, but owing to the shifting forwards of the weight the gait becomes clumsier and every movement more laborious. In very healthy, big and broadly-built women it is true this drag forwards is less than in slender small ones. The descent of the uterine fundus is caused chiefly by the entry of the foetal head into the maternal pelvis.

With the taut muscles of primiparæ, this entry takes place earlier than with the slackened tissues, insufficiently restored to the normal condition, of multiparæ, who are too often neglected as regards this.

The movements of the child are felt almost as if it were



pressing its feet against the strong muscular support given by the uterus. It may be so, too, by the pressure of the child's limbs and involuntary contraction of the uterine muscles, Nature succeeds in getting the child into a position suitable for delivery, and in accomplishing part of the work of expulsion before labour actually begins.

By the slow but constant wedge-like pressing forward of the foetal head, the lower part of the uterus, as well as the upper section of its cervical canal, are dilated more and more, till finally only a comparatively short part of this canal is left, which, moreover, with multiparæ is already so wide that a finger can be passed through it. During this gradual process the uterine wall pushes itself as it were along the child's body. Thus a two-fold force is in operation, and this we can observe during the whole labour: the child presses downwards because there it finds the only possibility of getting out; the uterus, at the same time, moves upwards. These two opposite yet co-operating forces make delivery possible. This can best be illustrated by the process of carefully taking off a tight-fitting glove; while the fingers of the one hand are striving to get out of the tight casing, the other hand (to be compared with the uterus in this) gets the fingers free by turning the glove back. Just as carefully as a woman will slowly take off her glove so as not to damage it, Nature looks after the business of expelling the child. And just as it is slower and more difficult to draw off a new glove the first time without spoiling it, so the process of labour with the first child goes on more slowly. Almost imperceptibly, but still vigorously and without ceasing, contractions of the uterus take place in the last weeks for this purpose of driving downwards. These contractions are called preliminary labour pains.

By the descent of the head, the space left for the bladder and intestine is reduced to a minimum, so that in the last weeks of pregnancy a frequent need to urinate as well as constipation and hæmorrhoidal troubles may occur; indeed, one may almost say do occur as a rule. Often, too, women complain of the sensation of great pressure downwards.

In the outer genitals too, marked changes take place in



the last period: the vagina, a comparatively narrow channel in the virgin, has to dilate far enough for the head and body of the child to be able to slip through without tearing it. The vaginal tissue becomes more and more saturated with a gelatinous fluid which drives the individual filaments apart and stretches them. The colour of the mucous membrane becomes perceptibly darker owing to the blood vessels showing through. The woman notices these changes most by an increased secretion of mucus, which occurs and often develops into a more or less irksome discharge. This secretion of mucus effects the lubrication of the vaginal passage.

In addition to all these special harbingers, we have besides those of a general nature from which we may conclude the approach of labour. A certain inner unrest and discomfort take possession of the woman. She is nervous, rather absent-minded, and likes leading the conversation to the impending confinement. She wants to know from her friends precisely what difficulties there are, and may easily get into a state of excessive anxiety if the people about her do not take very deliberate steps to check it. In addition, as a rule, there is disturbed sleep, caused partly by the lively movements of the child, loss of appetite and changing colour. The sleeplessness, if it does not pass otherwise, can be checked with a mild soporific. As a rule, the want of appetite need not be taken very seriously; by having small quantities of suitable food at frequent intervals faintness can be prevented. And the changing colour is not disturbing, but caused by the unnoticed preliminary labour pains which bring about a momentary alteration in the distribution of the blood.

Unexpectedly, and unsuspected very often, after a few hours' sleep have been enjoyed for the first time for days owing to the slighter foetal movements, the first labour pains occur. Most labours begin at night; even labours which begin by day generally come on after an interval of rest. A pain coming on suddenly and really painful for the first time frightens the woman, for the slight dragging at the back with which the preliminary pains are usually



indicated has not as a rule had serious attention. Now she waits anxiously to see whether the process will be repeated. The second strengthens her conviction that the matter is serious now, and she considers what is to be done. The peacefully sleeping husband is awakened or should be wakened. Even though labour may drag on for a long time still—the husband should take part in the beginning of this experience. At first the pains occur at long intervals ; many women have even fallen asleep after the first and second pains. However, this does not last long, the intervals become shorter, and when the pains—contractions of the uterus which make the abdomen feel hard—begin to occur at regular intervals of about fifteen minutes, it is time to let the doctor and midwife know or to take one's trunk and go to the hospital.

So much for the harbingers of labour. By general consent, we divide the actual process of labour into three parts or stages : I., the period of dilatation ; II., the period of expulsion ; and III., the afterbirth period.

I. *The Period of Dilatation*—In this first stage of labour by regular pains the expansion—in the language of the obstetrician, dilatation—of the uterine cervix takes place. In the preceding stages I described how in the last weeks of pregnancy this uterine cervix has become shorter and partially dilated, so that now only a short channel separated the uterine cavity from the vagina. In primiparæ this channel is comparatively narrow ; in multiparæ relatively wide. The aperture with which this canal opens into the vagina must be dilated by the labour pains so that the head and body of the child can pass through. In obstetric language, we say that the dilatation of the os uteri must be complete.

By the contraction of the body of the uterus its contents will be compressed, particularly in the upper parts. We must imagine this somewhat as if one were trying to squeeze out the contents of a tube by pressing at the extreme end. It is clear that such pressure from above extends the outlet. Now our comparison comes to a stop, inasmuch as in the tube the " lower " wall is particularly strong and the egress



of the contents consequently can take place only through the narrow aperture, whilst in the uterus this lower part of the wall is even specially elastic and can consequently expand and contract.

At this point, the child is as a rule still enclosed in the foetal envelope, which is fixed fast to the wall of the uterus by the placenta. That is to say, it is swimming in the liquor amnii ; and since the uterine walls do not constrict it, it has a certain facility of movement within the space, which as a whole we will call the egg. In the case of the bird's-egg, which is born whole, we can see a certain rounded cone-form. The cone-shaped preceding part expands the way out for itself. So too with the human egg in labour : where the amniotic sac is intact, a point similar to that in the bird's-egg is formed. Filled with amniotic fluid, this takes from the head the task of dilatation in which, owing to its fluid content, it can adapt itself to the ebb and flow of the forces. With each pain the conical end of the egg is driven downwards ; with each pain, the os uteri expands a little. In the interval between pains the expansion achieved remains ; the egg, however, relieved of the pressure, retreats a little upwards again. As on the seashore, when the tide is coming in, every wave hurled with more and more forcible impact on the shore flows back again, and yet the main body of the water covers the shore higher and higher, so the egg, in spite of retreating when the pressure of the labour pains relaxes, descends slowly and steadily into the vagina. The os uteri not only expands, its margin also becomes gradually thinner and more dilated, and the muscular substance of the uterus steadily draws further back upwards over the lower pole of the egg in the way which I tried to make clear above. Then it no longer gives any support even to the amniotic membranes (of the amniotic sac) ; ultimately they are no longer able to hold out against the pressure during a pain, and the amniotic sac bursts in a way sometimes faintly audible. The bag of water which was in front of the head in the amniotic sac flows away, and the way is clear for the child to get out. Labour now enters upon a new stage : the period of expulsion.



Before I proceed to describe this new stage I must go back to the beginning of the period of dilatation again.

The labour pains, which at first occurred at intervals of a quarter of an hour, gradually become more frequent till finally, at the end of the period of expulsion, they recur at intervals of two minutes. When the first painful pain occurred the woman was taken with surprise—groans and laughter all at once; when it was over there remained great amazement and joy that consummation was at last approaching, which may be expressed either in laughter or tears. The forms of expressing, the reaction caused by the beginning of labour, are as varied as temperaments. Even a doctor rarely has the chance of being present at the very beginning of a labour. I believe that most women keep the first labour pain a tender secret between themselves and the coming child, and that only those who have felt it themselves know what thoughts and prayers pass through the head and heart of the woman who is now for the first or further time to experience the great, sacred and, at the same time, alarming process of becoming a mother.

The minutes between the first and second labour pain are a woman's dearest possession. It is in her power to use them to gain mental strength, or to waste them in hysterical fear. I believe, and my belief has been confirmed by many women, that in most women a jubilant thanksgiving goes up whilst she fixes her attention on herself and waits to see whether the process which shook her out of the tranquility of her existence is going to be repeated.

With primiparæ, the intervals between the individual pains are longer than with multiparæ. With the latter, labour sets in at once with greater strength and intensity; the pains come in quicker succession; and the whole act of delivery also makes quicker progress because the genital passages are better prepared, owing to the earlier confinements, and have never got back their original inflexibility and stiffness. The contractions of the uterus cause a characteristic pain—this is just why they are called "pains"—which begins in the sacral region, radiates from the loins



to the genitals, and makes the patient feel a great need for support at the loins to relieve them. The uterus contracts visibly and perceptibly, the abdomen actually becomes arched in very strong "pains." A great unrest sets in outside and inside: there may easily be flatulence, sickness and vomiting—in short, the whole body is disturbed. The number of pains fluctuates within wide limits; the progress of labour depends not so much on the number as on the strength and effectiveness of the individual pains and the resistance to be overcome. Many women find the dilating and preparing pains more painful and unpleasant than the expulsive labour pains which occur later, and are justified in demanding a certain mitigation of the pain even at that stage. The particular unpleasantness of the pains in the first stage of labour is due for the most part to the fact that the patient feels herself at the mercy of the forces of nature, without herself being able to contribute anything to the progress of the delivery or to accelerate the expulsion of the child. She feels she is just an object and clings appealingly for help to the nearest human being. Doctor and midwife can do a great deal to make this period bearable by soothing talk as well as by diverting her. The sensitiveness and power of resistance of individual women, moreover, varies very much. Although a certain amount of self-control is to the interest of all who are taking part in the delivery, and most of all to that of the patient herself, yet it must not be forgotten that actually every confinement takes a different course and that the expressions of pain may be quite justified, especially if a big head has to be got through a comparatively narrow pelvis, and consequently the nerves in this are more violently crushed than where there is no disproportion.

II. *Period of Expulsion.*—When the os uteri is fully dilated and the head of the child approaches the pelvic floor the second stage of labour begins. From the outside this time becomes perceptible, owing to the fact that when the os uteri passes over the foetal head, slight tears are caused in the margin of the os uteri which bleed a little in the intervals between the labour pains. This insignificant



bleeding is generally regarded as a sign of the approaching completion of parturition ; yet it must not be relied on too much, for such admixture of blood in the mucus being discharged may often appear much earlier.

The period of expulsion often does not last more than two hours with primiparæ ; with multiparæ, it is generally completed in half to three-quarters of an hour.

So far the attitude of the foetal body, the same as it had in the last week of pregnancy, has been fairly unchanged ; in the great majority of cases the child's back has lain on the left side of the body, the mother has felt the most lively foetal movements on the right side of the abdomen. Owing to this position the foetal head too had entered the pelvis in the same oblique attitude. Now, in accordance with the law of least resistance, during expulsion the head goes through a number of movements corresponding to the curvature of the uterine-vaginal canal—or better expressed, it is rotated by the expulsive forces in such a way that it appears at the vulva with the occiput in front.

With the beginning of the period of expulsion, the character of the labour pains changes. After quite a short interval for rest, in which the patient can get strength for the active co-operation now impending, the expulsive labour pains, which get stronger and stronger and come at shorter and shorter intervals, begin. There is now a greater pressure on the intestine, sometimes, too, remains of fæces may be pressed out, the labour pains force the patient to co-operate whether she will or not, to put her trunk and abdominal muscular pressure in action as in evacuation of the bowels, and thus actively to help the expulsive forces to succeed in bringing the child's skull over the lower edge of the os pubis, against which it has been pressed. Owing to the patient's co-operation, to the physical effort made by her, she is less vividly conscious of the effect of each separate pain, although the pressure of the foetal head and the stretching of the soft parts sometimes draw a cry from her.

The perineum—that is the region between vagina and anus—keeps on dilating and arches forward more and more the longer it lasts. The entrance of the vulva becomes



bigger and bigger ; during a pain one now gets a glimpse of some of the hair on the foetal head ; but it disappears again in the interval between labour pains. At last it advances sufficiently for the head to be visible even in the interval between pains ; and now the obstetrician has to protect the perineum from being torn, though this is not always possible.

In the expulsive labour pains the patient has, of course, to be supported differently than in the preceding stage. In the first stage of labour she will often lie in bed more or less hunched together, when many women prefer the side position and like best to be alone in the dark. Pain is easier to bear in the dark, especially if soft music comes from a neighbouring room, some women say. As soon as the expulsive pains begin, however, even the most unselfish woman asks for help. The hands grope for something to hold, the feet want to press against something. If the patient is lying on her back, then the loins are pressed hard against the bed beneath her ; in the lateral position, she needs someone to give support at the small of her back, which is best done by a nurse pressing firmly with both hands. In many countries, nowadays, the dorsal position in bed is considered best. In other countries it is thought that the lateral position meets the requirements of labour better. Views on this matter have changed in the course of time, and will perhaps admit of further changes still. In the Middle Ages, women were delivered sitting on an obstetric chair, and there are obstetricians who would like to see the obstetric chair brought into use again. It has certainly many advantages, as it gives the patient a firm resistance to press against, but it precludes the possibility of lying down to rest in the intervals between pains.

From time to time foot supports and other apparatus have been devised which can no doubt help to make things easier for women in childbirth. For the most part, however, they can only be fitted to a hospital bed specially arranged for them ; in a private house, human aid must be substituted for them. On the whole, I think intelligent human assistance better than mechanical aid, however well devised—for



only by presence of mind and constant attentiveness can all that is necessary be done, as and when required.

During the interval between labour pains the patient lies full length on her back or side, and by taking deep breaths gathers strength for the next labour pain. After a short interval she feels her muscles growing tense again, the uterus arches forward as hard as iron, and a pressure downwards makes her work with all her might. She takes a breath again, then bears down, at the same time shutting her mouth tight. Care should be taken that she bends her head forwards and not backwards during this exertion, because otherwise there is too much strain on the thyroid gland. As the hands seek something to hold, to make the force of the abdominal pressure more effective, she is given strong wide bands of linen which are slung round the foot of the bed and can stand hard pulling. She must also have some support for her feet to press against. Such support can be improvised according to the position the patient assumes. If she is lying on her back, the midwife or nurse can give the necessary help by holding back the legs at the knees. Often the patient will take hold of her legs at the knees, and so be able to give the necessary support and resistance herself. Thus the advantages of the crouching position are combined with those of the recumbent position. During the interval between the pains, the arms and legs should rest again. This is the best way to avoid a troublesome cramp in the calf, which often occurs towards the end of labour.

At last it gets to the stage where the head of the child stays visible in the vulva. Now the legs must be kept well back to make it possible for the obstetrician to give effective protection to the perineum. At this point patience is to be recommended, especially to primiparæ. Naturally, she now bears down as hard as possible to hasten the expulsion of the child. The dilatation of the perineum, however, in order to prevent its being torn, should be done gradually and slowly and not with one jerk. It is better to undergo a few more pains, and so avoid an unnecessarily big tear or any tear at all. Therefore the patient should follow pre-



cisely the orders which the obstetrician will give her at this stage with regard to bearing down. Here self-discipline and the control of her muscles as regards the desired tensing and relaxing, which has been acquired by the preceding gymnastics, can be of great use. If there has been no exercise of this kind the patient can best avoid undesirable bearing down at any particular moment during the last pains by making herself breathe deeply and regularly with her mouth open. As a rule the obstetrician will prefer to have the passage of the head take place without a labour pain, whether he gets it out by pressure applied below the os sacrum or has the patient bear down.

A last strong pain, generally accompanied by a cry, and the head of the child is born. After careful turning back to the original position, the passage of the shoulders, helped by the obstetrician in such a way that by a slight pull downwards, first the forward shoulder, then by lifting slightly the other shoulder, can proceed through the vulva without tearing the perineum. The rest of the body follows in a few seconds, and, as a rule, the first breath is drawn immediately afterwards and with it comes the first cry. Sometimes a short time may pass before the child cries, though this need not cause any anxiety.

It seems hardly credible to the mother, who threatened to break down a few minutes earlier, because the pains were almost unbearable, that it is all over now. For the doctor who has to see so much pain and suffering, it is always a most overwhelming experience to see how, within a few seconds and minutes, the face of the patient, which has just been drawn and strained with pain, changes to incredulous wonder and then to radiant happiness.

The child after its birth is still joined to the mother's body by the umbilical cord. Its birth is followed by a flood of liquor amnii and some blood. The child must now be freed from this fluid as quickly as possible. Then the ligature and division of the umbilical cord takes place. The cord is removed by ligature as near the child's body as possible, the stump covered with sterile gauze and given further attention later.



III. *The Third Stage of Labour.*—With the birth of the child the process of labour is still not quite finished. Now the afterbirth, the placenta with the amniotic membranes attached and the other part of the umbilical cord have to be expelled. The umbilical cord hangs out of the vagina and is left untouched. After a short time fresh contractions like labour pains in character occur in the uterus, which has now shrunk to the size of a child's head, and these contractions effect the detachment of the now superfluous placenta ; after about fifteen to sixty minutes the expulsion is generally completed. The discharge of about a pint of blood follows the placenta, in the detachment of which from the inner surface of the uterus quite a number of blood vessels must be torn. This hæmorrhage is normal and gives no cause for worry. Now, however, the uterus has to contract quite hard again, and only a slight further discharge of blood should take place. If the organ does not contract satisfactorily, then measures must be taken to arrest hæmorrhage. Just as with the expulsion of the afterbirth, further slightly painful contractions of the uterus take place also in the following hours and days—"after-pains," which are generally more painful in multiparæ than in primiparæ. After the expulsion of the placenta is over, the patient is washed and her bed linen changed ; it is an advantage to have a second bed at her disposal for this purpose.

When she is in fresh clothes with the child in her arms, she greets the first visitor, the happy father, and can then get her well-earned rest ; for the next few hours the child makes no demands on her.

Before I conclude this chapter I must touch on a few more not unimportant questions. First : who should be present at the confinement ? The doctor, of course, and/or the midwife. Then, if possible, another reliable woman, preferably a nurse ; in some cases a calm experienced elderly woman-member of the family or a neighbour. Generally, it is enough for her—if she is not a nurse—to be at hand in a neighbouring room to give



help if required, and only entering the lying-in room when called.

A much disputed question is the presence of the husband. In this, in my opinion, the decision must rest with the wife, though the power of nervous resistance of the husband himself must be taken into consideration. A man overcome with pity and trying not to faint is of no use ; a calm, sensible, amiable husband, on the other hand, can be a great relief to both wife and obstetrician. Hence, this question cannot be answered in the affirmative or negative on principle ; it will have to be decided in each individual case. In big hospitals and lying-in institutions, the exclusion of the husband is a matter of course ; in private nursing homes and in his own house his presence can generally be made possible, if it is desired. It must, however, be a fixed rule that the husband must go out if those in charge of the confinement consider it necessary, and another to the effect that the patient's wish not to have her husband present should not be told him as a reason. The doctor or midwife must take the responsibility for it.

The presence of her own mother is rarely wanted by the patient, and that of the mother-in-law still less. Often it is difficult to avoid ; but, if it seems necessary, her absence from the room, at least during the expulsive labour pains, can be insisted on. In this case, too, one can only decide each case according to individual circumstances, and the patient's wishes must settle the question. But here more than ever the obstetrician must be responsible for this decision.

How must the nursing be done in parturition, and when is the patient to lie down in bed ? This question must in my opinion be answered as follows : the woman is to lie down in bed if she feels the need for it, but in any case after the rupture of the foetal membranes, even if this takes place at an earlier stage than is described here, and most certainly when she feels pressure downwards or the need for bearing down. The bed should have clean sheets, the under-sheet must be changed from time to time ; when to do so is a matter for the person in charge of the confinement to decide.



Frequent attention must be paid to the careful and sufficient evacuation of bowels and bladder. After each arrangement of this kind thorough cleaning with a disinfectant fluid must take place. Many obstetricians like to have the pubic hair shaved off in order to avoid having particles of dirt sticking to the hairs ; as to whether shortening is sufficient, no generally applicable decision can be made. The best way is for the patient to leave the decision to the people in charge of the confinement without bothering too much about these questions ; subsequent removal, perhaps, in stitching a perineal tear which has occurred in spite of every care is much more difficult and inconvenient than removing it beforehand. Also, for childbed, it is wholly favourable if there is no hair.

Any particle of dirt, however small, contains within it a danger for childbed. The uterus, after the expulsion of the placenta, is in its interior a great wound cavity, and is just as easily—if not more easily—infected as other open wounds. For this reason the obstetrician, notwithstanding most careful disinfection of his hands and protective rubber gloves, will make an internal examination only when for some important reasons precise knowledge of the momentary state of labour is necessary. Otherwise, we can but emphasise repeatedly as the most important guiding principle in a confinement : Most scrupulous cleanliness and, therefore, hands off the genital organs !

The patient herself should not touch her sexual organs on any account during parturition, and should also not allow them to be touched by any but the persons trained in midwifery. Indeed, she should push caution so far as to do the washing of her sexual organs in the last period before delivery only with hands which have been well washed first, and never use a sponge or towels which are not perfectly clean.



## CHAPTER IX

### SOME REMARKS ON THE CONDUCT OF NORMAL BIRTH

BIRTH is to be regarded as a normal physiological process in conformance with the laws of life. That is, it is to be treated like every other vital function; and hence, so long as it takes a normal course, need have no special aid. This title therefore contains an apparent contradiction.

To the layman it seems a matter of course that with wild animals and primitive people childbirth is an easy process. The reports of explorers with regard to this, however, are mostly very superficial, and are by no means strictly corroborated by persons living in closer contact with the peoples and animals given as examples. Moreover, the oldest human chronicles give particulars of midwifery—a sign that help has actually been necessary at all times, or, at any rate, has been wanted, a fact which the painfulness of the process makes it easy to understand.

Meanwhile, there can be no doubt that civilisation has not in general had a favourable effect on the human capability of child-bearing. What other factors have contributed to this, we cannot examine in detail here. Only a few may be emphasised which seem to me to be important, and yet are usually overlooked. In the first place, there is the intensive mixing of different races which has taken place in Europe and America. In America this has been brought about in a relatively very short time by the immigration of members of many nations already to a very great extent mixed in themselves; in Europe the mixing process in the main had already taken place much earlier: the migration of peoples in the first centuries of the Christian Era certainly represents in this only an episode of secondary importance. War campaigns and other occurrences mixed



up races in such a way—to give only one example of importance for our consideration—that big-headed men were crossed with narrow-hipped women. The consequences in the sense of making child-birth difficult are obvious, as then generally hybrids begotten of parents of different build are born with greater difficulty and danger.

Moreover, midwifery itself has made its tasks more numerous and complicated. If, by its interference, it is able to overcome the difficulties which result from the disproportion between head and pelvis, that is to bring the products of racial mixtures unfavourable in this respect in the world alive, then it has added to its tasks for the succeeding generation, since, according to *Mendel's* Laws, a portion of the characteristics comes into existence again, so that the same complications of delivery also recur; that is to say, for instance, a relatively narrow pelvis and a big hard skull sooner or later coincide again.

Finally, the increase of neurosis in so far as we have to reckon it the manifestation of fear, seems to me to have made the act of delivery more difficult; the woman who is free from fear is able to employ her abdominal muscular pressure to assist the labour pains at the right moment; the one who is afflicted with fear and, at the same time, suffering pain holds her breath during the labour pains, bears down at the wrong time, and thus exposes her perineum to danger that would seriously damage it during delivery if skilled hands and soothing words did not intervene to help her.

Considerations of this and of a similar kind make it easy to understand how civilisation has gradually increased the difficulties connected with the act of delivery, and make us realise why every woman must be given the assistance necessary in her hours of difficulty.

The necessity for keeping a strict eye on every labour is further clearly shown by the experience that even the apparently normal occurrence may, as it proceeds, reveal complications which make the assistance of a doctor absolutely necessary. Midwife and doctor therefore are called in to keep a systematic watch over the woman in labour,



and thus recognise disorders at a time when they can still be successfully checked.

As I have already emphasised, this supervision should be carried out even in pregnancy, and also a thorough examination at the beginning of labour is particularly important. The midwife entrusted with giving assistance should, therefore, be summoned as early as possible. If the confinement is to take place under the direction of a doctor without a midwife, the same holds good as regards sending for him unless he has examined the patient shortly before and ascertained then that everything is in order. It is best for the nurse, who in the last-mentioned cases is to look after the patient instead of the midwife, to be in the house beforehand, or at least to come to the house at the first sign of the approaching labour in order to make the necessary preparations.

One of the obstetrician's most important tasks is the prevention of puerperal infection.

Scarcely seventy-five years have passed since the Hungarian obstetrician, *Ignaz Philipp Semmelweis*, proved in the hospitals in which he worked that puerperal fever fatal to mothers, this terror of women in childbirth, was caused by a wound infection starting in the uterus, due to infective material, particularly pus-forming bacteria, being introduced by the examining finger into the sexual organs, multiplying there and penetrating the tissues.

The life, the struggle and the final ruin of this man is the classical example of the tragic fate of the doctor of genius far in advance of his time. Just as he met with unbelief, was misunderstood, and, overcome by the struggle, died in a lunatic asylum before his doctrine met with general recognition, so it happened in the same way—though it did not lead to such tragic results—to his precursors, the American, *Oliver Wendell Holmes*, who, likewise, encountered harsh rejection on the part of the leading men of the time, and others (the Dane, *Schleisner*; the Edinburgh doctor, *Blackmore*; the German, *Ahlfeld*). But when *Lister*, proceeding from *Pasteur's* bacteriological work, built up his method of antiseptic for the prevention of wound fever,



and *Pasteur* with *Doléris* discovered the most dangerous of the excitants of puerperal fever, then *Semmelweis's* opinion prevailed, and gradually the principle of doing one's utmost to keep exciters of disease and sepsis of a bacterial nature away from the sexual organs of women in childbirth and childbed (as well as from pregnant women soon to be in labour) became the principal law of obstetrics. The measures taken in accordance with this principle have had a striking success: whilst the mortality from puerperal fever in the pre-antiseptic period was 20 to 25 per cent.; indeed, during certain hospital epidemics, over 30 per cent.; the death rate has since been reduced in some hospitals to 0.15 per cent. None the less, in Germany in 1928, about 3,400 women died of puerperal fever after childbirth, and a far greater number died of the same disease after miscarriages.

What has been said suffices to show what inestimable importance obstetric asepsis (the art of keeping bacterial germs away from wounds and operations, or in this case from penetrating into the sexual organs) and antisepsis (counteracting possible germs already present) have for women in childbirth; and to make clear why, in looking after a confinement, one of the most important duties of the obstetrician consists both in observing the rules of asepsis with the utmost punctiliousness himself, watching that they are observed equally scrupulously by others, and seeing to the greatest possible cleanliness of the woman in childbirth and of all that comes in contact with her. For this reason, the rule which *Stoeckel*, whom I have quoted several times already, gives his pupils in his text-book of obstetrics is very much worth noting. "The examiner, before even touching the outside of the patient's abdomen, has to wash in an openly thorough manner with water, soap and brush. Although germs conveyed to the abdominal walls at first do no harm, yet, in the course of labour, the germs may very easily be carried further towards the genitals. Besides this first washing in the sight of the woman in labour has a symbolical significance: it acts as proof of antiseptic conscientiousness and of cleanliness which inspires confidence."



That a proper surgical disinfection of the hands, as if for an operation, should be a routine procedure before they are to come in contact with the sexual organs, and still more before the examining finger or hand is inserted in the vagina for any interference, is a matter of course. Whether circumstances make it possible, and, owing to the progress in technique, they make it more and more possible, after disinfecting the hands, they should for greater safety be covered with sterilised (made free from germs) rubber gloves. In greater interferences, and in particular where the hand has to make its way into the uterus, this extra precaution should never be omitted.

The necessity for the sterilisation of instruments, dressings, etc., now need no longer be stressed. Besides, it is comparatively easy to do.

The asepsis of the sexual organs themselves is a matter of more difficulty—and with it we touch upon a very delicate point in obstetrics. The vulva and the vagina in any circumstances contain bacteria in great numbers, and generally in not inconsiderable variety. It is impossible to remove them wholly by washing, douching or the use of disinfectants. In attempting to remove them, one must even not take too strong measures, because one might thus injure the tissues, which are loosened and sensitive just by pregnancy, and might deprive them of their natural power of resistance. As a rule, however, the bacteria to be found in the vagina, which has been untouched for some time, are comparatively harmless—that they are not entirely so is proved by the infective power of the lochia also in these cases, and is due to the development of pus-forming germs previously present. Moreover, unless a bacteriological examination involving much time and trouble has been undertaken, we never know anything definite about the germs present—unless, owing to existing morbid symptoms, such as a purulent discharge, their dangerous nature is certain.

Consequently the obstetrician in contradistinction to the surgeon (who, when the case is not a septic one, is faced with a "clear" field of operation, and has only to be careful that



he does not bring in any germs) has, as regards asepsis, always to do with a "suspected" field from which, as experience teaches, symptoms of infection may emanate even if it has not been touched.

This situation has various annoying sides : to see wounds occur in a non-aseptic region of the body, or even it may be to have to make wounds, is always worrying for a doctor trained in surgery. Further, the obstetrician has a certain dread of introducing his finger into the vagina for examination, because he has to reckon with the possibility of thus conveying germs into the vicinity of the vaginal orifice to the more deeply situated parts of the sexual organs where harm may be more readily done. And, finally, it makes him uneasy to think that he himself—or someone else for him—might be held responsible for the occurrence of a fever which might have arisen in spite of all his timely attention. If fever occurs in a case where no internal examination has been made, the obstetrician knows he is not to blame for it ; if he has inserted his finger in the vagina, then he can never know whether the patient would have had a fever without this examination, and his anxiety about the patient is aggravated by this doubt.

It is obvious that the more clearly this situation is realised the more cautious one should be, and the more one should try to leave untouched as far as possible the interior of the sexual organs.

Midwifery has derived great benefit from this. As such, I may mention first of all the development of the external examination, which makes it possible in the great majority of cases to get a fairly accurate view, not only of the presentation and attitude of the child and of its proportion to the pelvis, but also of the progress of delivery. Then the examination from the rectum which, to anyone who has had practice in it, as a rule makes him sufficiently acquainted with the degree of dilatation of the os uteri, the position of the presenting parts of the child and so on, thus giving him an opportunity for checking and supplementing the results of the external examination. The examination "per rectum" is also less unpleasant to the patient, all the more



so as the lateral position with the doctor standing behind her is easiest for her. With this kind of internal examination, it is true, no such exact recognition of details is possible as with the insertion of two fingers into the vagina, and so the latter, in case of doubt about any point, remains absolutely necessary. In normal labour, however, it is generally made superfluous by the rectal examination. No disadvantages are attached to this latter in my opinion, provided that it, like every obstetric examination, is carried out with consideration for the patient, and with a rubber glove on the hand so as to avoid the examining finger being soiled.

I may mention in conclusion, as a further advantage of the said restraint, the conservative—*i.e.*, averse to any avoidable interference—attitude of the obstetrician which results from it. To put it better, the advantage of this attitude lies in the disinclination which has arisen for any superfluous examination and interference.

One disadvantage, and that a considerable one, in many cases has resulted nevertheless from this way of thinking: midwifery became too passive in its attitude. Doctor and midwife confined themselves to the thorough observation of the condition of mother and child, and were, it is true, prepared to interfere at any time if it was necessary in order to save the life of the child or to avert serious danger from the mother. In other respects, however, the words "hands off" held good.

Fortunately, since then, *i.e.*, in recent years, people have come to think that though the grounds for suspicion, which were given above, concerning the asepsis of the female sexual organs continue to exist now as before, yet the dangers associated with them are not as a rule so great as to justify such far-reaching passivity on principle.

Under the influence of this recognition, the pendulum has inclined in the opposite direction and an "active midwifery" developed about which we are now going to speak. First, however, it may be explained that most of the leading obstetricians take a middle course, a course, however, which



is not pursued in the same way in all cases. As I understand it, I would describe it as follows : where the external examination, supplemented, if necessary, by rectal palpation, leaves no doubt of the existence of wholly normal conditions, and labour proceeds without hitch and comparatively easily, I consider it most sensible not to touch the vagina ; but if there is any reason for vaginal examination or for accelerating labour by an intravaginal manipulation, then in normal circumstances, as regards the degree of cleanliness of the sexual organs, the obstetrician should not be deterred from doing what he considers proper by the fear that infection may occur.

It goes without saying, that this weighing of pros and cons does not make the task of taking charge of labour easier ; it is obvious also that the dividing line between passive and active varies considerably whenever the circumstances in one direction or another can no longer be regarded as normal. However, it is the obstetrician's duty—and within the limits of her authority, also the midwife's—to make such decisions conscientiously ; and it is one of the duties of the patient and her family not to make such decisions more difficult by joining in the discussion, but to show confidence in accepting the obstetrician's word calmly as a matter of course.

The range of ideas with which the advocates of active obstetrics justify the methods they use is, in the first place, suggested by the desire to shorten the suffering of women in childbirth. Further, they say that with shorter duration of labour, there is less danger of infection. This certainly holds good on the one hand, but, on the other, in so far as this shorter duration is achieved by intravaginal interference, it conflicts with what we have already explained. They add also that by avoiding a very long duration of labour the danger of exhaustion of the patient is precluded and that of secondary hæmorrhage less. The child, they say, is not so long exposed to pressure which is, or, at any rate, may be of considerable importance for its brain in particular, and so the prospect of its being born with a better brain is



perhaps greater than in the case of a labour which is protracted.

The "active" obstetricians called their procedure "merciful childbirth"—certainly not without justice if everything goes as they intend it to.

Their measures can be divided into medical and manual (done with the hand); yet they can in most cases be applied in well-considered conjunction.

Bursting the amniotic sac artificially is recommended as a simple method of accelerating labour. *Van der Hoeven* has used it systematically for many years, and his experience has not lessened his original enthusiasm for the procedure. He has many followers, yet others reject this procedure as a method, although they admit that in many cases labour makes considerably faster progress after this slight interference. To be consistent with what has been said above, I shall not be able to decide to act contrary to the principle of keeping the vagina untouched solely for this purpose; yet, in case of an internal examination with a favourable position of the skull, and a dilatation of the os uteri of at least 4 or 5 cm., I should make use of the opportunity of doing the bursting.

A number of obstetricians go even further in the direction of activity by carefully but effectively dilating the os uteri, and on certain occasions, also the vagina with the fingers or the hand. The procedure is very old and was resorted to often in classical French obstetrics. Also modern French obstetricians (*Bonnaire*) and in connection with it Dutch obstetricians (*Treub* and his disciples) make use of a manual dilatation of this kind till the os uteri is completely dilated, yet only as a preparation for an artificial termination of labour where this has become necessary. *Aschner's* procedure is vehemently opposed by many medical teachers in the hospitals, praised in other quarters. With proper indication and technique (*i.e.*, proceeding slowly without using any force) it is said to give splendid results and to be quite without danger. As with so many medical methods, in this case, too, success will no doubt depend on the skill, caution and other personal qualities of the person who



uses this method. For the patient, the procedure need cause no unpleasantness if she is anæsthetised a little with a few cubic centimetres of ethyl chloride.

If this kind of dilatation of the genital passages is applied in the first stage of labour—the period of dilatation—then another principle of dilatation is brought into use in the second stage of labour. This principle is probably much older and much more widespread than the method I have just mentioned, which is no doubt due to the fact that it is applied to the parts situated more towards the outside and needs less or hardly any knowledge to use it in its primitive form. At the time when my grandfather practised as a country doctor, it was zealously carried out by untrained “midwives” and often by mothers or by neighbours who had many children. They called it “helping,” and this “helping” consisted in two unwashed but oiled fingers being inserted into the vagina, and stretching round about the vaginal orifice but especially towards the perineum from the outside. The doctors of that period, who were aware of the importance of the aseptic method of treatment, had to fight energetically for many years before this custom was eradicated ; and I myself remember many a discussion with mothers or grandmothers of the lower classes who could not understand the inactive waiting of the young doctor, urging him to “help” or wanting to undertake his supposed duties in this respect themselves. But when the active course began to replace the passive, the pendulum swung back again in regard to this too, though it must be emphasised that only a very limited number of obstetricians have so far followed this movement. After *Rudolph*, as early as 1913, and *Hoehne* in 1928, had stood up for this procedure, it has been recommended recently from American and Russian quarters. The first two joints of the index and middle fingers of both hands are introduced into the vagina, and now with pauses of one or two minutes, a cautious but continuous pull or pressure downwards is carried out. Three things are supposed to be achieved by this : the muscular layer of the pelvic floor is stretched and loosened ; the labour pains are stimulated ; and the foetal head, which



is exposed to very great compression, especially with a hard pelvic floor, is relieved. The efficacy of such a procedure is for me beyond question, but I have also just as little doubt that a continuous manipulation of this kind inside the sexual organs is safe, so far as the dangers of infections are concerned, until we possess means of making the bacteria present innocuous.

The principle of activity is carried furthest by those obstetricians—only a very few—who promote the child's birth shortly after the commencement of the labour pains, or even at a fixed time at the end of pregnancy as calculated. Thus the American physician, *Potter*, in about 75 per cent. of the confinements entrusted to him, gets quick delivery by dilating the genital passages, altering the head presentation to a foot presentation and drawing out the child by the feet. Further, from various quarters, "merciful childbirth" by Caesarean section has been recommended. I have already explained in the fourth chapter that, however beneficial this operation may be in particular cases, it is too great an interference to be carried out if Nature can manage the delivery in its own way. And this holds good to a still greater degree, in my opinion, for *Potter's* procedure.

Likewise, the method of the French doctor, *Delmas*—"Delivery at an appointed time"—I think must be rejected for similar reasons; but I am mentioning it here in order to show by another example how far the active course can go. With *Delmas's* procedure, the methods used by many doctors in surgical and gynaecological operations are employed, that is, a solution of a preparation, a substitute for cocaine (*e.g.*, 52½ m. gr. of the relatively less poisonous tutocaine) is injected into the lumbar region. This makes the lower part of the body insensitive and—as *Delmas* and the advocates of his method state—at the same time a relaxing of the lower part of the uterus occurs, which is said to make it possible to dilate the os uteri without difficulty so that the child can be drawn through it. It goes without saying that those who make use of this procedure are satisfied with the results obtained by it, otherwise they would not recommend it. On the other hand, however,



reports of serious hæmorrhages and laceration which have occurred in particular cases are made. I must confess that if I were in the patient's place, I would rather bear the pains and discomforts of labour than the chances, for good or evil, of a painless and quick "merciful childbirth" of this kind.

The use of drugs in the active method of procedure in managing childbirth seems to me to be attended with few disadvantages. In it, however, proper methods and dosage, which are not too easy, must be taken for granted, for, if improperly applied, the forces of Nature, instead of getting support, are brought into serious collision, and are thrown into confusion so that the opposite of what was intended results. Of the old stimulants of labour pains, quinine has continued to prove best; it has even risen in the estimation of obstetricians in recent years in spite of the competition from hormonal preparations with stronger action. Of the specifics for accelerating labour got from ductless glands, I may mention, besides the pure pituitary preparations, the thymophysin introduced by *Temesvary*, a combination of the gland extract just mentioned and that of the thymus gland. Thymophysin is gaining ground steadily, both in cases where the labour pains from the first are far from satisfactory and for accelerating labour in itself normal. *Van der Hoeven*, after having burst the amniotic sac with 4 or 5 cm. dilatation of the os uteri, and stretched the edge of the orifice (of the os uteri) a little with two fingers, gives it every half or three-quarters of an hour in injections of  $\frac{1}{4}$  cm., so that, after approximately three hours, 1 cm. altogether has been given. However, he gives a warning against giving it earlier, *i.e.*, with too slight dilatation. The circular muscle at the edge of the orifice then contracts below the head and the expansion of the os uteri does not increase. With greater dilatation and the amniotic sac burst, however—as this clinical teacher emphasises—the skull is much better pressed into the orifice during the labour pains and it prevents the latter from contracting.

So much for "merciful childbirth." We have now to mention another important achievement of modern obste-



trices which is of great importance for managing childbirth, because it makes it possible to get in time a reliable idea which can be expressed in numbers, as to whether the spontaneous (taking place by itself) expulsion of the child may still be considered possible or must be regarded as impossible. The method referred to here, which does not show a single disadvantage for the patient, is that worked out by *Frey* in the women's clinic in Zurich. It consists in a systematic counting of the labour pains, and has quickly won extensive recognition. By this method it becomes possible to avoid any unnecessary interference, and—given a longitudinal presentation of the child—to operate only in cases in which the figures show that no living child can be born in the natural way. *Frey* has ascertained that the duration of labour must no longer be judged by hours but by means of tables of labour pains showing every case. In this, the number of labour pains whilst the amniotic sac is intact is of no importance. On the other hand, the pains to be counted *after* the rupture of the foetal membranes, both in the period of dilatation and in the expulsive period, are of great importance. Primiparæ need 50 to 200 labour pains in the first stage of labour after the rupture of the membranes; in the second stage, 50 to 75; for multiparæ, these numbers are 50 to 175 and 25 to 50. The numbers given as maxima are necessary only with premature rupture of the membranes; the minima hold good if this takes place when the os uteri is as big as the palm of the hand.

With this we have come to the end of our brief consideration of the problems and progress with which modern midwifery has to be concerned, and in which a very important problem, that of allaying pain in labour, is left over for the next chapter.

About the duties which devolve upon the obstetrician, even during the "passive" period, and which have lost nothing of their importance, we are not going to speak at length here. They comprise the control of the presentation of the child, of its condition, of the condition of the mother, and the supervision of the process of labour in the direction



of recognising at each stage any deviations from the normal which may occur so that one is ready to deal with them.

For the first-mentioned purpose he will make the external examination by palpation of the abdomen at the beginning of labour, and as often again as he considers necessary, and supplement the results by rectal palpation or, if need be, by a vaginal examination.

The condition of the child he will control by listening at regular intervals to the cardiac sounds. A statement of the intervals at which this listening—which should always be done in the intervals between labour pains—must be repeated seems to me too stereotyped. One lets it depend on the course of events. Accurate observation of the action of the child's heart permits of any approaching danger to its life being recognised early enough to interfere in time (so far as the other circumstances permit).

We are now going to discuss two points about which the same opinions do not prevail among all obstetricians. First, there is the position of the patient. We have already touched on this question in the preceding chapter, and seen that sometimes the lateral, sometimes the dorsal position is preferred. I prefer the lateral position not only because I am accustomed to it. In the first stage of labour, in my opinion, the dorsal position is mostly to be preferred only if the head has not yet entered the pelvis. Otherwise, in normal labour, there are advantages in the patient lying on the side towards which the child's back is lying, *i.e.*, in the majority of cases on the left side. The upper part of the uterus, and with it the child's trunk, then falls to some extent over to the left and consequently the back of the child's head comes to be rather lower, and this favours the movements which the head has to carry out (passively) in the passage through the uterine canal. This holds good in particular for the period of expulsion, in which in the lateral position the occiput carries out the dilatation in front more easily. In addition, in this position, the vaginal examination is less worrying for the patient, and the rectal palpation can be done more easily. Finally, the lateral position is more convenient for removing any contents of the intestine which



may have been pressed out, the perineum can be better attended to, and the region behind the anus, from which the manipulation to press out the head should take place, is easier to get at. On the other hand, as an advantage of the dorsal position may be mentioned that even when the foetal head is emerging, and whilst protecting the perineum, it is possible at any time to auscultate (listen to the foetal cardiac sounds).

The other point in which ideas are more or less divergent concerns the protection of the perineum. It can be done in various ways, the discussion of which must be left to the text-books on obstetrics. At all events, it is important to have the head go through in such a way that it passes the narrowest point of the vaginal orifice with the smallest possible diameter. To make this clear, *Stoekel* uses a very good comparison as follows: The circumstances are similar to pushing a button into a buttonhole which is rather too small for its greatest diameter. If one presses the button with its flat surface against the buttonhole or pushes it through very quickly the buttonhole tears. But if on the other hand, one tilts the button, first pushes through a small segment and then the whole button, the buttonhole stretches without tearing. The head too must, as it were, go through the hole of the vulva like a button.

As a rule, Nature manages this by herself, and it is sufficient to take care that the passage through does not take place too quickly. The obstetrician can try to prevent this most simply by keeping the head back with his hand during the labour pains, and the patient can help a great deal in this by complying with the request not to bear down any longer. It is best if the obstetrician holds the head which is about to pass through between one hand placed on it and the other, which is mainly holding the posterior portion of the perineum, beside the coccyx. In this position he then slowly presses it through in an interval between pains. If he sees that there is too great a disproportion between the circumference of the skull and the outlet, it is advisable to slit the perineum with a pair of scissors, for a wound caused by a cut is easier to stitch, and offers better prospects of healing,



than one caused by a tear. As a rule, pain from a cut of this kind does not cause the patient annoyance, because the tissues being so much dilated a cut through them is less sharply felt, and on the other hand, the combined pain of the moment is, in any case, severe. In cases where a general or local alleviation of pain has been introduced, this pain does not come into consideration at all. However, we are now going to discuss the alleviation of pain in childbirth.



## CHAPTER X

### THE ALLEVIATION OF PAIN DURING CONFINEMENTS

THE problem of obstetric prevention of pain occupies the central point of gynæcological discussions. At almost every session of the associations of the profession, this question is discussed so that the facetious expression, painless delivery, the latest fashion in obstetrics, is very appropriate, though this does not mean that this line of research is therefore made ridiculous or trifled with. The obstetrician has too long been inclined to accept the pain accompanying normal labour as natural, and scarcely to regard it as an evil worth keeping in check.

It is to be understood that the doctor who, like no other, has his attention focussed on the study of Nature, and who has realised the wisdom and expediency of every happening, asks himself whether, looked at from the biological point of view, the painfulness of labour is necessary. Yet the fact that he has recognised birth as the only physiological function attended with pain makes him reflect whether this pain may not be able to exercise an influence on the process of childbirth, which is to a certain extent favourable.

The answer to this questioning consideration discloses only two important points for a favourable influence of this kind: the pain of labour during the period of dilatation stimulates strong respiratory movements which ensure an increased oxygen content of the blood during the contractions of the uterus (which proceed with a certain restriction of oxygen for the child). And, in the period of expulsion, the sensation of pain may in its reflex action stimulate the abdominal muscles to activity, that is, to an increased co-operation of the abdominal pressure which promotes delivery—and this holds good particularly for the dilatation involving pain of the pelvic floor by the advancing head.



Although these influences which help forward parturition have not such paramount importance that they can be cited in favour of the rejection of the alleviation of pain during delivery, yet, in my opinion, they must quite decidedly be taken into account in regard to the methods of alleviating pain. Are there serious reasons of another kind for leaving women in childbirth at the mercy of the pain imposed on them by Nature without attempting artificial alleviation? A common objection made, particularly by the women themselves, comes from religious considerations. The biblical curse, "In travail shalt thou bring forth thy children," makes many women refuse the elimination of pain of labour as a divine decree. *Gauss*, one of the German pioneers in the matter of checking the pain in labour, called a meeting of representatives of every religion, and asked them to state their attitude; and this unique council decided unanimously that there was not a single reference in any of the records concerning these religions of any necessity for the suffering of women in labour. The correctness of the passage quoted from the Bible is, moreover, open to doubt; and *Buber*, after comparing the various original texts, put difficulty in place of the "travail" of the Lutheran interpretation.

Moreover, the doctor is far from wanting to persuade a patient to take drugs to alleviate pain during labour. If he thinks it necessary, he will give a sedative in any case; but otherwise the mitigation of her pain signifies a concession which a doctor can give his patient at her own wish, and not a measure which he will try to induce her to take. This does not alter the fact that he will try to convince her of the baselessness of her reasons, if he has the impression that it would be good for her.

The doctor will certainly not make this attempt to convince in the case of those women who have a decided wish to bear the whole experience of birth while conscious, and therefore want to suffer the natural pain. In those cases where this wish is due solely to a certain exaltation, it may be changed to the contrary quickly enough when once the pains begin in full strength, and the doctor will then grant



the alleviation sometimes passionately refused without reminding the patient of her heroic resolution. But where the patient is serious in the former desire, and the obstetrician is convinced that her intention is the result of calm reflection, he will show the patient his respect for her courage and strengthen it. Nor will he let his feeling of respect for such an attitude be lessened by the thought, which arises in certain cases of this kind, that pain and pleasure often show themselves to be closely related, and the bipolarity of psychical feelings may happen to come to expression even in this situation. Actually, we find the *simple refusal* to have pain deadened, in so far as it is not made on the ground of principles, in the really heroic women, and in those who are in general not very sensitive to pain, or have already had the experience that delivery proceeds easily; whilst it is a different matter with those who have the craving, as it were, to taste the experience of birth to the full. These are women who either have their interest focussed exclusively on the child, or on the experience of birth itself, which makes up for the want of other natural experiences they have never had. In the one as in the other case, there is usually something wrong in the marriage; yet in contrast with these I have met both young and elderly couples who in their overflowing feeling of love have wanted to enjoy to the full, and suffer to the full together, this happiness, too, with all its pain. The sight of such a loving couple may recall *Mathilde Wesendonk's* words: "If pain only brings delight, O how glad I am that nature has given me such pain."

Thus the impulses of the spiritual life are manifold even in this connection, are often in conflict with each other, and the results are various. The woman, however, who wants to live her life as consciously as possible, acts rightly in thinking out beforehand the question of alleviation of pain during labour. As, however, she cannot judge the various factors which come into consideration, such as, for example, the influence of narcotics on the child, I consider a discussion of this matter with the doctor who is to assist her desirable, indeed, necessary.

Doctor and patient should get to know one another in



this connection too during pregnancy. The doctor who has to relieve her in the so-called "hours of trial" must have an impression of his patient's disposition. The patient, moreover, must also know the doctor's attitude to questions like these. It is her right, for she must not be exposed to surprises when it is too late for an expression or an agreement of opinion. If, for instance, the doctor should be opposed to deadening pain in labour, and the patient wants it in any circumstances, they can still part in peace beforehand, whilst a clash of opposed ideas in this matter during the confinement is extremely vexatious, and may cause harm in every respect.

A discussion about these things can, moreover, give the doctor valuable clues to go upon. It will, for example, give him the opportunity of diagnosing any slightly neurotic fear of labour in time and giving suitable treatment. If the obstetrician is trained in psycho-therapy—as every gynaecologist should be—then it will be best for him to undertake this treatment himself, otherwise he must leave it to a nerve specialist, who, as I explained earlier, should avoid as far as possible a long-continued analysis bringing consciousness of psychical complexes, etc.

If it is a question of nothing more than a certain stage-fright, not psychically abnormal, before the confinement, then the obstetrician is the very man to get rid of this feeling by psychical influence. Usually he will get the best results if he explains to the patient what is happening to her, and what is going to happen, thus giving her confidence, and making her feel hopeful because of the soothing effect of knowledge. However great the part played by confidence in the doctor may be in any treatment of the sick, in labour it is still more important. Experience shows that encouragement from, or the mere presence of, the doctor is able to make the pain more bearable. If this is true of a strange doctor, then how much greater is the influence of this kind if it is exerted by someone whom the patient has known for some time as her trusted adviser. In this respect the general practitioner—the family doctor who also practises midwifery—*e.g.*, the country doctor, provided that he has



a good knowledge of and experience in midwifery, often has many advantages over the gynæcologist who only appears occasionally. On the other hand, the great popularity of certain obstetricians is due rather to their general human qualities than to their suggestive abilities. One might formulate the doctrine: confidence in the doctor, faith in him is the most effective palliative for the pains of labour.

Still, in this it is not only a question of *alleviation* of pain. If one is to succeed in giving relief from pain psychically then one must, to keep to medical methods, first of all turn to hypnosis. Its value in particular cases, in spite of numerous unfavourable results, is unquestionable. The ability to make the psychic connection necessary for producing a hypnotic state is certainly not given to every doctor. According to the personality of the hypnotist, and the individual to be hypnotised, a period of preparation varying in length will be required. If, however, the space between is successfully spanned, and the difficulties overcome, then hypnosis may prove to be an excellent procedure. The hypnotist has little to do during labour; the bulk of the work is done in the preparatory meetings. The objection made to hypnotism, that its use may be considered a psychic trauma (injury, wound), merely shows that the rudiments and mode of action of this sometimes beneficial procedure are misunderstood.

In hypnosis, then, we have a means of acting on the body by means of the mind. In addition to it, we may mention the endeavours which, in the form of a theological doctrine or part of such a doctrine, are directed towards controlling the body by the mind. In this the procedure of the Indian Yoga may be mentioned, and in doing so I may point out that German psychologists, such as *Hauer* and others, who have tried to tread the paths of this intensification, not only gave enthusiastic descriptions of the profundity of this experience, but were able also to make discoveries of scientific and therapeutic value. The thorny paths of this doctrine, however, are difficult of access, and only to be trodden by dint of great exertion. Moreover, a



preparation solely for the purpose of controlling the pain of labour is opposed to the essence of true Yogism, which is to be sought only for its own sake. Whether Christian Science and other doctrines, all of which strive in their way for mastery of the body by the mind, have any notable results with regard to diminishing the pain of labour, I do not know ; nor, I frankly confess, do I know how far these doctrines aspire to diminish pain or aim at bearing it with composure. Any theological doctrine may be of value in this respect, for every deep and true faith has the power to go on working miracles. The enumeration of objections to a doctrine or its founders proves nothing against its value. In order to perceive this, we have only to call to mind the truism that "preoccupation," whether with universal, philosophical or social systems, has the greatest influence on personality.

The Berlin nerve specialist, *I. H. Schultz*, with his "auto-genous training," has achieved this in a way simpler, and at any rate more natural to medical thought, than that which the adherents of certain theological doctrines advocate. By concentration of thought, it is possible, after sufficient practice, to influence physical sensations, as well as the functions of certain organs, to a very great extent by an act of will. In the seventh chapter I have already stated that I regard relaxation of tension in oneself by concentration—autogenous training—as fitted for playing an important part also in regard to what is being discussed here. Unfortunately, only a very limited number of women can contribute the mental power and perseverance necessary for this.

Now, if we turn our attention to influencing pain by chemical specifics, then it will occur to us at once that three main methods of operation are available : the introduction of medicines into the body which reduce the sensation of pain generally, inhalation-narcosis (numbing the senses by inhaling certain substances), and the application of methods of producing local insensibility.

With these three methods of resistance, we have two very



different kinds of pain to contend against: the pain of labour and the pain of dilatation. This latter as a rule does not come into consideration till the second stage of labour, that is, the expulsive stage, in particular when the head begins to press on the pelvic floor, dilating the perineum and the orifice of the vagina. It—the pain of dilatation—transcends the pain caused by the contractions of the uterus. The latter pain, which is caused both by the contraction in itself and by the dragging on the uterine ligaments and the perineum in its “pure form,” is dominant during the first stage of labour—the period of dilatation. It is the actual labour pain, but it is certainly not unimportant in the period of expulsion as well, for the labour pains are also strongest and most intense just then.

It is clear that different steps have to be taken against the pain of labour than against the pain of dilatation, and it is clear also that the expulsion pains require stronger interference than those of the period of dilatation. Also the stronger specifics, which are brought into use in the last stage of delivery, do not come into account in the whole of the preceding time, because the progress of the process of labour would be hindered by them, and the child might also suffer too much from them.

Thus the two most important objections which can be made to the relief of pain during labour by drugs are mentioned at the same time.

In general, it may be said that with the exception perhaps of such specifics as are used to check certain “ordinary” pains, such as aspirin, pyramidon and the like—there are no drugs which reduce the pains of labour without impairing the action of the uterus, that is the strength of the pains, and, if given in bigger doses, also the abdominal pressure. Just as little do we know, again speaking generally, any specific for deadening the pains of labour which might not have an unfavourable influence on the child.

Hence, the important thing is to choose the specific or specifics of such a kind that these two unfavourable consequences may be avoided as far as possible, and yet the



desired effect attained as much as possible. Medical skill, with the aid of the chemico-pharmaceutical industry, has already so far succeeded in this that we have at our disposal various methods of checking pain in labour which show favourable results in practice, and have besides no or only very slightly unfavourable effect. We must confess, however, that the last word in this matter has not yet been said, and we may with some confidence hope for further improvements.

The method of procedure with which so far the best results have been achieved is based on various items of knowledge, for the most part gained by experience, which have developed more or less into principles.

The first of these items of knowledge is that we should keep our aims within bounds. Practically speaking, this means giving up the effort to eliminate all the pain during labour, or at any rate, having it kept down in such a way that the patient, kept insensible during the whole confinement, remembers nothing of the whole process afterwards. The method of twilight sleep which acts in this way was worked out with infinite patience by *Krönig* and *Gauss*, who had great knowledge and experience. It has had considerable success not only in Germany but also in America, and, to some extent, in England. It has been more or less discontinued again, however, because eventually there were too many reports of unfavourable results. Also the time when women insisted on being wholly released from pain in labour is for the most part already past, and what is left of it is passing. The attitude of women who are looking forward to their delivery has changed everywhere ; and their desire for alleviation of pain, as may easily be understood, still holds good in most cases, yet they do not want to have the great experience, as such, eliminated, and prefer retaining the memory of it to forgetting the whole thing—as was the case for a time. For these various reasons, the use of twilight sleep is now confined to certain clinics which make a speciality of it. And this is as it should be, for the method can be regarded as without danger to the child only if it is managed most carefully, and the woman supervised the whole



time by a doctor familiar with this procedure in all its refinements. Also the clinic itself, or the special section involved and its staff, must be thoroughly organised and trained for it. Even then, twilight sleep is still not quite free from certain risks for the patient, since even the most experienced doctor, the most skilful nursing and the best clinic cannot prevent conditions of psychical derangement of varying degree from occurring occasionally in connection with this treatment.

A second principle which was perfected comparatively early is that of the *combination of various medicines*. We owe a great deal to *Bürigi* the Berne pharmacologist's important studies of the combined action of different medicaments. He showed, to put it briefly, that the combined action of two suitable substances can have an effect greater than the sum of the two separate actions. Where it is a question of alleviating the pains of labour, the steps taken are mostly in accordance with this principle, or else simply by summing up the effects of various drugs. Morphia, at first used by itself, was gradually combined with other specifics which increase its effect. In particular, the use of morphia along with the very powerful scopolamine has been carried out. Twilight sleep, of which we have just spoken, is started and maintained with this combination, though many obstetricians, even when they do not want to get such comparatively deep insensibility, make use of morphia with scopolamine. However, we have to be extremely careful with the latter drug. Even in the very small doses in which it is administered, it can have a bad effect on the child and put the mother—though this is very exceptional—into a state of excitement which does pass away again, but still is an unpleasant complication. Most doctors, therefore, think that a woman who has had scopolamine must be constantly watched. This should be done by the doctor himself, or he should at least be close by, as is the case in the clinic.

*Sellheim's* suggestions for relieving all women, even those who are delivered with only the aid of a midwife, from the worst pains of labour by the administration of scopolamine are contrary to this opinion. He wants to give



women in labour " a liqueur with a nice taste " which contains besides pantopon (instead of morphine)  $\frac{1}{2}$  mg. of scopolamine, half to three-quarters of an hour before the passage of the head is expected. The midwife is to send to the doctor for the prescription, but he need not see the patient himself; the chemist is to keep this medicine in stock in a special packing; the midwife has to stay with the patient in any case in this stage of labour. Such is *Sellheim's* proposal, a sincere effort, the merit of which cannot be denied, to give women who are not delivered in hospital or under the care of a doctor—indeed, they form the majority of the women in childbirth—the " blessing " of alleviation of pain. It seems to me improbable that he will be able to succeed in his attempt, for doctors, as may be understood, have acquired a certain respect for scopolamine, and besides are to start with—in my opinion rightly—against a stereotyped use of powerful drugs.

The combination of scopolamine with morphine (or drugs closely allied to the latter) has the greatest importance in its use as a preparation for inhalation narcosis. Chloroform, ether, or whatever anæsthetic we are to take, all act better, more quickly and in smaller doses when tranquillity has been previously obtained by suitable doses of scopolamine-morphine. Regarded in this way, the administration of the said combination a short time before the final stage of labour, whether given in *one* dose or in several doses, has the double advantage of alleviating the pain of labour and of making preparation for a slight inhalation narcosis, which we like to use with the passage of the head, in such a way that a minimum of the anæsthetic is sufficient.

There are, moreover, innumerable other combinations as well which have similarly, though less strongly, that two-fold effect.

A typical example of the synergetic (in combined action) use of different specifics for the alleviation of the pains of labour is given by the method of the New York obstetrician, *Gwathmey*, which has met with a certain amount of approval in Europe also. It is a combination of the narcotic and pain-assuaging actions of various medicines—morphia,



magnesium sulphate, ether and alcohol. A small dose of quinine is added so as to do away with the detrimental effect of the other drugs on the contraction of the uterus. Part of the treatment is administered by injections under the skin or into a muscle; another part (quinine, alcohol, ether), mixed with oil, is dropped into the rectum. *De Lee* (Chicago), from whose well-known text-book of midwifery I have taken this description, adds: "We have used this technique with some satisfaction, and have varied it to suit individual cases. The method is not adapted for doing away with the pains of labour altogether, nor is that its purpose; most women, however, get considerable relief." So far, only a few harmful results have been recorded. Occasionally the labour pains become weak and labour is protracted; on the other hand, tears may occur in the cervical portion of the uterus if the pains are too strong (quinine), but this is not noticed in the insensible patient. In isolated cases the child is too much affected by insensibility to be made to cry easily. The method should not be brought into use where some diseases exist. *De Lee* does not make use of the portion administered per rectum unless the injections have proved unsatisfactory, and often leaves out the quinine when the contractions of the uterus are good and the labour pains need no stimulation. For these reasons each case must have careful individual treatment, and only those combinations should be used which are needed for the particular patient.

I have translated *De Lee's* information so fully, not only because the imperfections of the method, and the objections which can be made to it, can be clearly recognised, but also because two further principles come into prominence here which are of the greatest importance for a beneficial use of the alleviation of pain in labour. I refer to the principle of the *compensation of unfavourable factors* and the principle of *individualisation*.

*Gwathmey* tries to make good the weakening effect of narcotics on the labour pains with quinine. In Europe, too, we might say from the first, people have acted in accordance with this principle, for the weakening effect on the labour



pains of morphia and from the opium from which it is prepared respectively has been known for many years, and the stimulating influence of quinine on the pains likewise, so that it was obvious that an attempt at compensation should be made. People remained faithful to the principle, even although morphia was replaced by other narcotics; and quinine has had to give place for the most part to the harmonic preparations, chiefly thymophysin, which stimulate labour pains.

We have already seen that these preparations are used particularly for accelerating labour. At the same time they compensate for the effect of the narcotics in protracting labour. Hence the narcotics and those preparations work hand in hand both to bring about an alleviation of pain in delivery and an acceleration of the whole process. The combination of them, then (if need be together with the manual interference which we discussed in the preceding chapter), forms the method of "merciful childbirth."

The last-mentioned principle, that of adapting the specifics and methods chosen for the alleviation of pain to the temperament and condition of the patient, should really need no special mention, for it is a fundamental truth that the doctor, conscious of his responsibility in the steps he takes, must act according to the needs of the individual. As we have seen, however, the fact that so many women have to suffer the pains of labour without a doctor being present has led of necessity to the endeavour to invalidate the preservation of this principle in these cases. It is possible that a specific may be found which can be administered without objection, because it is free from harm to mother and child and yet alleviates pain fairly satisfactorily. We will hope so. But for the present we must really stick to adapting the specifics we know to individual cases. And where we have to combine a maximum of favourable with a minimum of unfavourable effects, we shall even in obstetrics never be able to depart from this.

The store of drugs at our disposal for the purpose under



discussion is great, and the number of methods of using them considerable. In general, it may be said that specifics for deadening pain which are to be inhaled should have the preference in the period of expulsion, whilst those to be given in another way are to be preferred for the period of dilatation. Nevertheless, it may be mentioned that some obstetricians use inhalation narcosis also during the latter part of the first stage of labour, and inversely various methods of deadening pain by other than inhalation specifics are used comparatively frequently, even for the period of expulsion.

Further, it is a rule that the specifics for inhalation narcosis are to be given only *during* the labour pains (and, apart from this, at most when the head is passing through), whilst an intermittent administration of this kind is not possible for specifics acting in a different way.

The inhaled specifics—the actual narcotics—are given in obstetrics till complete unconsciousness is reached, and, in this case, without interruption only when an important medical interference is to be undertaken. For shorter and less radical but still painful treatment, which does not require complete relaxation of the muscles, a slight degree of insensibility is sufficient. Of the three specifics for general narcosis which are mainly used in Europe—ethyl chloride, ether, chloroform—the first is the most suitable for such a short intoxication; ether can also be used for this; chloroform is not suitable. On the other hand, chloroform is preferred by many for the typical obstetric alleviation of pain during the expulsion: at each labour pain the patient is made to inhale a little chloroform. This is sufficient to alleviate the pain without impairing its strength, and it does not do away with the abdominal muscular pressure; it does not make the patient unconscious; indeed, one can even make her understand, for instance, instructions for bearing down or not bearing down (take a deep breath!); the narcosis can easily be deepened a little for the passage of the head, and as soon as the worst is past the patient is sufficiently conscious again to hear her child's first cry, too. A sovereign remedy,



therefore—sovereign, too, in accordance with the name, because Queen Victoria had chloroform administered to her in 1853 and 1857, and thus did a great deal to spread the method just described, which is still called "*narcose à la reine*." The introduction of chloroform as a narcotic was, after all, the achievement of an obstetrician. After it had been discovered in 1831 by *Liebig* and by *Soubeiran*, *Simpson* at the end of 1847 recognised its narcotic effect. From that time forward he used it instead of ether, which at the beginning of the same year he had been the first to use in obstetric practice, when he did a version and an extraction under cover of it. *Simpson* stood up for chloroform and/or narcosis in delivery with all his energy, and in doing so met with the fiercest opposition. He had almost the same experience as *Semmelweis*—among whose opponents he was, moreover. Fortunately, however, he won his battle soon enough to be able to enjoy the victory which was such a blessing for humanity.

In after years chloroform was superseded by ether in operative surgery, and many obstetricians followed in this course. This is not the place to weigh the advantages and disadvantages of these two anæsthetics. In my opinion, there is still justification for the existence of both, and in practice in private houses chloroform in many circumstances really has most advantages.

We have already spoken about ethyl chloride. It, too, is used by many obstetricians in the method *à la reine*.

A few further words about gas narcotics in the narrower sense of the word (of course, the previously mentioned general anæsthetics are also gas narcotics, for a liquid cannot be inhaled, it must first have passed by evaporation into gas): nitrous oxide, ethylene and purified acetylene. The last, introduced by *Gauss* and *Wieland*, has not so far come into general use; it explodes too readily. Nitrous oxide (protoxide of nitrogen with oxygen), on the other hand, has been in use for a long time; it was recommended for surgical purposes by Sir Humphry Davy even as early as 1800. It is a very convenient specific for narcosis of short duration, as with a dentist, because the patient reawakens at once



and his health is not impaired at all. In the United States, and in England, it is used fairly often for obstetric purposes. Generally, it is not sufficient for deeper narcosis—usually ether has to be given then as well. For producing insensibility at each pain, on the other hand, it is excellent. The complexity of its apparatus (gas cylinders, etc.) stands in the way of its general use. Also the art of nitrous oxide narcosis, which consists in adding the proper quantity of oxygen, is not everybody's business. In recent years, moreover, people in America seem less satisfied with nitrous oxide for deadening pain in obstetrics; at any rate, efforts are being made to replace it by ethylene with oxygen. This, too, has the disadvantage of complicated apparatus and quantities, as the mixture of the narcotic and the oxygen, has to be almost constantly changed. It has the same advantages as nitrous oxide without the disadvantage, so disagreeable in the latter, of easily producing cyanosis (reddish-blue discoloration of the skin, which indicates an insufficient oxygen content of the blood).

So much for inhalation narcosis. We see that further investigation is continually going on. For the purpose of a satisfactory alleviation of pain in the second stage of labour we can, however, very well be satisfied with chloroform or ethyl chloride *à la reine*.

The many lighter (and also heavier) narcotics which are recommended or tried for the first stage of labour, and at the same time to some extent for the second, are used in three ways: through the stomach, by subcutaneous injection or injection into a muscle, or by introduction into the rectum. In what has gone before we have already made various observations about them, and must refrain from enumerating or even discussing those specifics further. Here the principle of the necessity of individualisation should be taken into consideration more than ever. This, acting in accordance with individual idiosyncrasy, however, comes into consideration not only for the person of the patient, but holds good more or less also for the obstetrician. With the abundance of information on this subject which



comes to a doctor's notice, it is not only impossible for him to test every new specific, it is even undesirable that he should do so. Hence he will use those specifics to which he is accustomed, and the effect of which he knows from his own experience, and as a rule try a new one only when it has been thoroughly tested in the clinics.

The powerful drugs seem to me for the present unsuitable for use in rectal narcosis, and on the whole too dangerous. Quite a number of less powerful drugs are available for these three methods of employment.

As a specific very simple to use, said to be sufficiently effective, which does not affect the activity of the labour pains, and quite without danger to mother and child, I may mention hemypnon tablets, which consist of a combination of heroin-dial, 5 mg., and aneson (chloretone), 0.5 gm., the introduction of which we owe to *Hüssy* and *Rossier*, both Swiss. The first tablet can be given as soon as the os uteri is dilated to 3 or 4 cm. About an hour later, a second tablet is given, and then they can be given at gradually longer intervals up to six tablets in twenty-four hours. The medicine can also be obtained in the form of rectal suppositories; contents and quantities to be given are then somewhat different. The pain of the passage of the head cannot be satisfactorily overcome by hemypnon. It is countered with ether, chloroform or ethyl chloride.

And what about artificial local insensibility? I do not think that those methods which have their point of attack in the nerves which come from the lower part of the spinal cord (whether they take effect inside or outside the vertebral canal) come into consideration for general use. They are certainly not suitable for the alleviation of pain such as we are mainly concerned with here.

The only method of local anæsthesia (insensibility) which can be used outside the clinic is that which eliminates the action of the nerves which supply the pelvic floor and the skin of this part. Then no pain from dilatation can be felt. It need hardly be said that it has its advantages for the period when the head is passing through. But if we bear in mind that the pressure of the skull on the pelvic floor



has in its reflex action a favourable effect on expulsion, as the pressure of the abdominal muscles is stimulated by it, we shall understand that certain disadvantages too are connected with the total elimination of the power to feel in this part. And the pain from the labour pains is not alleviated at all by this pudendal anæsthesia. On the whole, there is only a limited use for local insensibility.

To sum up :—

An approved method of procedure for the alleviation of pain must fulfil the following requirements : (1) it must be without harm to mother and child ; (2) it must suppress the pain as much as possible without seriously obscuring the consciousness ; (3) it should not impair the activity of the labour pains and the operation of the abdominal muscular pressure ; (4) for general practice it must be comparatively simple to use.

These requirements will for practical purposes be best fulfilled by the use of a suitable, not *too* powerful, combination of drugs—such as hemypnon tablets—to check the pain of the labour pains themselves, and they will be supplemented during expulsion by the administration of a little chloroform, ether or ethyl chloride, *à la reine*. While the head is passing through, this intermittent, superficial inhalation narcosis can be deepened somewhat, and also be done between the labour pains. In this it is important to limit the dulling of the consciousness to the least possible, and for as short a time as possible, so that the patient does not miss the experience of birth altogether. For this is essential to her later psychical health—to attaining her psychical maturity.



## CHAPTER XI

### THE AFTERBIRTH PERIOD

THE afterbirth consists of the placenta with the part of the umbilical cord left on it, and the foetal membranes connected with the placenta. The afterbirth period begins immediately subsequent to the expulsion of the child, and is finished as soon as the remains of the "egg" are expelled. In this the placenta has the greatest importance. Naturally, the foetal membranes must also be expelled along with it, but in this final period of labour they are in fact accessory.

As a rule, the placenta is still more or less completely attached to the uterine wall after the birth of the child, and it takes some time before it becomes detached. The time varies a great deal; it may be said, however, that in normal cases it takes up to half or three-quarters of an hour for this.

After the birth of the child one can feel the uterus as a nearly round body, the upper limit of which reaches almost to the navel. As the abdominal wall is greatly relaxed, owing to the suddenly diminished tension, one has hardly ever any difficulty in determining the size and consistency of the organ. This at first remains apparently passive; after a shorter or longer interval—*Frey's* investigations have revealed that contractions occur earlier and oftener than has hitherto been supposed—labour pains, however, become perceptible again. The patient does not always feel the contractions herself, for they are often not very painful; but the obstetrician can determine them by observing with his hand placed lightly on it that the organ is temporarily as hard as stone. After three or four of these palpable contractions, usually the placenta is separated from the uterus. The uterus, meanwhile, changes its shape—instead



of being round it becomes longer and narrower, and comes up higher. At the same time the organ tilts a little, so that its left side comes towards the front more distinctly than at any other time. Generally, the body of the uterus falls over to the side a little as well, so that its upper surface reaches nearly to the upper costal arch. This movement upwards of the uterus is often assisted by the bladder filling up quickly after the birth of the child. Following the separation, the afterbirth is pushed out through the body of the uterus to the lower, more relaxed, part. This can often be recognised ocularly while observing the abdomen and by careful palpation with the hand, because one perceives a soft curved swelling above the os pubis and below the hard body of the uterus. An inexperienced person may make a mistake in this, if he takes the full bladder for this swelling.

Under the influence of the last contractions, the involuntary abdominal muscular pressure and the force of gravity, the placenta which draws the foetal membranes after it reaches the vagina. In many cases the patient feels a certain need to evacuate the bowels during this movement, owing to the pressure exerted on the rectum, and this is a further sign that the afterbirth period can be brought to an end.

There are, however, still other characteristic signs that the separation of the placenta has taken place which the obstetrician will take into account. These are connected with the umbilical cord hanging out of the vulva. To make them more easily recognisable, it is customary when ligaturing and dividing the umbilical cord to place two ligatures near the child's navel and divide the cord between them. Then a third, less tight, ligature is placed near the mother's genitals. Now, by watching this third ligature, one can see whether the umbilical cord advances. If it comes farther and farther out, it is a sign that the placenta has separated and is coming down.

A further sign—that of *O. Küstner*—consists in this, that if the obstetrician presses the abdominal wall deep down above the os pubis (with the bladder emptied!), if the placenta is still attached, the umbilical cord is drawn



back a few inches into the vagina, but if it remains where it is the afterbirth has separated.

*P. Klein* has drawn attention to an easily perceptible sign; if the patient bears down and the umbilical cord then advances and stays where it is when the pressure ceases, then the placenta is separated. If it recedes again, the separation has not yet taken place.

For the sake of completeness, I may mention further the sign of *Straussmann*. If light rhythmic tapping movements are made on the uterus with one hand, whilst the umbilical cord is held loosely between two fingers of the other hand, then the transmission of the tapping to the umbilical cord will be felt if the placenta is still attached. When it is separated, then the tapping will no longer be transmitted.

The supervision of the hæmorrhage is of very great importance. To make this easier, and to avoid having to uncover the patient so much when examining, *Stoeckel* recommends the following procedure: "after ligature and division of the umbilical cord, blood and liquor amnii are wiped away, any fæces that may have been pressed out at the passage of the head is cleaned away from about the anus, and the perineum carefully examined to determine whether it has to be stitched. The umbilical cord is turned up and placed loosely in the mother's groin. Then the doctor sits down beside the woman, who is lying on her back, pushes his hands from right to left under her back and with them rubs hard downwards over the buttocks of the patient, who rests firmly on the hands. A not too thin piece of cotton wool is pressed against the vulva, and by putting the legs over each other the thighs are shut well together (*Fritsch*). This position brings it about that between the buttocks and between the thighs there are no longer any interstices into which the blood coming from the vulva can flow unnoticed. The blood finds only the one outlet between the cotton wool and the vulva, and is thus compelled to rise up to the mons veneris. In this way a very quick and, for the woman, very considerate control of the hæmorrhage during the afterbirth period is made possible."



Now the obstetrician has nothing to do but wait, look after the condition of his patient, and see that she is kept quiet, for which, with the joy of all those concerned, he often needs both tact and authority. The patient, especially if she has perspired a great deal, or complains of thirst, should now get a drink, but not too much for the time being, lest the bladder should get too full, as this has an unfavourable effect on the after-pains, and hence on the separation of the placenta. She is well covered up and the doctor (or the midwife if she is managing the confinement alone) sits down by the bed. His care is concerned in the first place with the pulse. If this is good—*i.e.*, after an acceleration at first as the result of exertion and excitement, becoming slower and, above all, full and strong—then it is certain that no great loss of blood is taking place. If there is any doubt, it is advisable to see whether discharge of blood has taken place, or is taking place, and to note the state and hardness of the uterus by careful palpation.

If everything is normal, then the obstetrician ought to confine himself strictly to waiting in this first period, let us say during the first half hour. He should *not* press on the uterus; he should *not* massage it (as unfortunately is still being done far too much), but constantly keep in mind that the tendency to interfere constitutes the greatest danger for the patient in the afterbirth stage. As a rule, the patient says after she has felt the first after-pains that something warm is flowing from the vagina. Then he should look quickly to see how much blood has passed. In the position just described the blood flowing upwards does not rise high enough to overflow to the femoral folds. If the condition is actually as stated here, then this slight hæmorrhage is no reason for the obstetrician to abandon his waiting course, for he will reflect that a certain loss of blood in the afterbirth period is a necessity caused by the separation of the placenta from its attachment.

Counting the labour pains systematically in *Frey's* way, of which we spoke in the ninth chapter, has also brought about observations important for the afterbirth period, for it has shown that where the smallest number of labour



pains is required to end this period, there is also the least loss of blood—and that less than 3 oz. in one to five labour pains.

Not till it is ascertained by the above-mentioned signs that the separation of the placenta has taken place can we proceed to bring the afterbirth period to an end—by helping the placenta lying in the vaginal tube outwards by abdominal muscular pressure or by the pressure of the obstetrician's hand. Many doctors prefer to have the removal done by the patient herself as far as possible. She is directed to bear down hard, and may also sit on the bedpan for a few moments, supported by one or two people, her pulse being carefully watched. By pressing down and the force of gravity the afterbirth then usually comes out. *Baer*, moreover, has given a simple method of making it easier for the patient to press out the afterbirth: with both hands taking hold above and below the navel, at the same time holding the straight muscles in a wide fold, he lifts up the abdominal walls. In this way the slackness of the abdominal wall is removed and the abdominal space diminished, so that the patient's bearing down—*e.g.*, by blowing hard on the hand, which she is asked to repeat—can be and is more successful.

Other doctors are of opinion that the exhausted patient should not be encouraged to press out the placenta herself. The obstetrician can do it for her. For this he puts his open hand over the uterus from above, during a labour pain, and presses it a little downwards slowly but necessarily with some force in the direction of the pelvic inlet. In this way the hard empty body of the uterus is used, as it were, like the piston of a "syringe" formed by the vaginal tube, the contents of which (the placenta) are squeezed out by the pressure. Which of the two methods of procedure is most to be recommended is a matter of opinion. At any rate, the first-mentioned way of acting should be preferred by midwives, in view of their regulations. For the doctor, too, it has the advantage of saving him from attempting to manipulate the uterus. Due regard for the strength and possible exhaustion of the patient, moreover, is, of course, essential.



Now there are also two methods again of getting the whole of the foetal membranes to follow. In one of these this is left entirely to the forces of nature ; in the other artificial assistance is given. In any case, however, this complete removal is important, for the remains of the foetal membranes left in the genitals soon begin to decay, and thus add to the risk of puerperal disturbances. In the first-mentioned case the force of gravity makes the membranes follow ; owing to the weight of the placenta passing down over the perineum the membranes are pulled along with it ; if they do not at once fall out with it, because the placenta is pushed against the bedpan placed beneath and its weight ceases to act, then the patient is made to raise her buttocks, and thus the force of gravity recovers its influence and the placenta pulls out the foetal membranes. In the other method of procedure the obstetrician takes hold of the placenta with a cleansed hand as it issues, and, if necessary, draws it right out, and, without pulling, twists it round, always in the same direction. Thus the following membranes are twisted together into a firm rope ; the connections which might still exist between them and the uterus are gradually separated ; and then all at once the rest slips out. The twisting should not be done during a labour pain, otherwise the membranes easily tear off. If this happens, the torn-off end of the rope should be caught with a clamp forceps and the twisting continued in the same direction. The advocates of the first method boast of it that the foetal membranes are less often torn off ; those of the second that the woman remains passive and thus does not get more exhausted.

Now the placenta has to be examined closely. To do this the obstetrician lays it with the foetal side on the palm of his hand and checks whether there is anything missing on the uterine side and whether the foetal membranes are complete. If a portion of the membranes is left behind, no action is taken. To be sure, there is the possibility mentioned above that remains of the membranes may cause a slight elevation of temperature in childbed ; yet the danger is not great, and the fragments come out by themselves in



the course of the next few days. On the other hand, if a piece of the placenta is missing—though in a normal expulsion of it this almost never occurs—then the obstetrician with the strictest observance of all aseptic measures must insert his rubber-gloved hand into the vagina of the patient, who is slightly narcotised and lying across the bed, palpate the inner surface of the uterus and then remove the part left behind, for a piece of placenta in the uterus causes secondary hæmorrhage or hæmorrhage and infection respectively in childbed.

In comparatively rare cases it happens that there has been a little accessory placenta which remains behind and then causes the same phenomena. Therefore, it too has to be removed. Suspicion of such a thing being present will arise if the placenta is remarkably small, or there are torn blood vessels running into the membranes, indicating an occurrence of this kind.

Now how long is the obstetrician to keep his waiting attitude, if the placenta does not separate of itself? An exact time for this is not stated. If there is no abnormally great hæmorrhage, and no suspicion that a great quantity of blood is accumulating in the uterus, there is no reason for interference, and the waiting can safely go on for two hours. There are many eminent doctors, however, who think that one should not wait so long, because the prospect of a spontaneous separation of the placenta after the lapse of about three-quarters of an hour can only be considered very slight, and there is no use in letting the patient lie so long in this situation. We must not question the decision if by reason of this consideration the obstetrician gives up waiting after three-quarters of an hour—provided that he knows he is not swayed by considerations concerning his own time.

If the retardation is due to the after-pains being absent or too weak, one can moreover begin a little sooner to massage the uterus gently from time to time with the palm of the hand. As a rule, it responds to this with a contraction. The only danger in this is—and it must certainly



not be regarded as imaginary as experience has shown—that squeezing or pressure may come of this gentle wide massage, for this is the very thing to disturb the course of the physiological process, because some places are thereby stimulated more than others, and instead of uniform contractions, irregular ones occur which do not detach the whole placenta, but only some parts of it. Many hæmorrhages and secondary hæmorrhages are the result of this unsuitable—nay, wrong—procedure.

We have another means of setting up contractions or stronger contractions of the uterus in the hormonal preparations made from the pituitary gland. Preparations of this kind are in fact very effective. By many obstetricians they are used prophylactically on principle, *i.e.*, these obstetricians give an injection of pituitrin or a similar preparation in any case, so as to accelerate the expulsion of the afterbirth and, in particular, to prevent a secondary hæmorrhage as well. This measure *used as part of a routine* is positively rejected by the leaders of the profession on the ground that the natural course of the afterbirth period is thus disturbed from the start. However, this does not mean that there is anything to be said against the very useful effect of such a specific in those cases where the contracting power of the uterus has proved too slight.

The situation is different as regards waiting when the normal course of the afterbirth period is disturbed by excessive hæmorrhage. The only question is, what has to be regarded as excessive? To be able to judge this properly, the obstetrician needs experience and a certain “clinical eye,” *i.e.*, an intuitive grasp of the general position based on experience. It does not depend only on a correct estimation of the quantity of blood lost, but on the impression which one gets of the reaction of the hæmorrhage on the condition of the patient. Generally speaking, women in childbirth and women who have been delivered bear loss of blood remarkably well—far better than a man, for example—but, even as regards this, one woman has a considerably greater power of resistance than another. Judgment is made still more difficult, because it is almost impossible by looking



at the things underneath the patient, etc., to form a correct estimate of the quantity of blood lost, and exact measurement, at least in private practice, cannot be made. Consequently, in this matter we have to depend on impressions, and, further, chiefly on judging the pulse and the condition of the uterus.

Abnormal hæmorrhage in the afterbirth period, in so far as it is not caused by tears in the cervical part of the uterus, may have two direct causes: incomplete separation of the placenta and deficiency of the contractions of the uterus after the separation of the afterbirth. As indirect causes, we must mention too rapid evacuation of the uterus (precipitate labour, artificial, quick delivery) and previous overextension of the organ (twin pregnancy, abnormally large quantity of liquor amnii). Further, above all, kneading and pressure of the organ, of which we have given warning above.

Then, among unusual causes, secondary feebleness of labour pains, during the birth of the child, which continues in the third stage of labour; and particularly constitutional peculiarities in this respect, which cannot be described more exactly, come into consideration. That such constitutional factors may be hereditary has already been mentioned in a previous chapter.

Increased proneness to an abnormal course of the last stage of labour can, therefore, be foreseen in certain cases; and the obstetrician will prepare for this, not only by choosing to have the confinement in a hospital or, at any rate, keeping everything ready which may be necessary in a case of this kind, but, above all, by additional attentiveness—an attentiveness which in this case, however, must include additional self-discipline. In circumstances such as we have specified above, the obstetrician will not confine himself to watching the pulse, but will put his hand lightly on the uterus, which enables him to diagnose an atony (deficiency in contraction) from the start.

‡ In slighter cases this can be effectively counteracted by massage of the uterus, whether with the palm of the hand or by light circular friction with the finger tips of one hand—yet avoiding kneading, pressing and squeezing. In addition



pituitrin or pituglandol (pituitary gland preparations) is injected into a muscle or, if necessary, into a vein.

If this is of no use, then *Credé's* method must come into use. In connection with this often abused method, the great value of which is nevertheless recognised by all obstetricians, there is rather a peculiar position, inasmuch as some doctors give this name to the simple expression of the *completely separated* placenta as described above, whilst others (of whom I am one) reserve the designation for those cases in which the afterbirth is still in the body of the uterus, and then generally not yet wholly separated from its wall, and hence has to be squeezed out of it. The first-mentioned obstetricians speak of an *enforced Credé* manipulation. However that may be, the (enforced) manipulation of *Credé* is a very good method of delivering the placenta if it is confined to those cases where an abnormal degree of hæmorrhage forces the obstetrician to carry it out. Further, an emptied bladder and a firm contraction of the uterus are required. If the organ is as hard as stone, owing to an after-pain which has occurred spontaneously or been induced by massage, it is then brought into the median line, and squeezed together hard by the open hand covering it from above, with the thumb in front and the fingers at the back. If the manipulation with one hand is not successful, then it is done again with both hands placed beside each other. In this way the object is usually maintained. If this does not succeed, then the effort should be repeated with the patient under an anæsthetic, and if even this is not successful there is nothing left but the delivery of the afterbirth with the hand—a difficult decision for the doctor, for he finds himself between the Scylla of waiting too long, with the thereby increased loss of blood, and the Charybdis formed by the necessity of penetrating through the lower genital passages containing bacteria to the upper parts.

To sum up :—

Hæmorrhages after the natural or artificial delivery of the afterbirth are caused by pieces of placenta left behind or an accessory placenta ; by deep tears in the os uteri or in



the vagina or—and this in by far the most cases—by atony, *i.e.*, deficient contraction of the uterus.

If there is grave suspicion of bits of the placenta having been left behind (a suspicion which is aroused or confirmed by the close examination of the afterbirth), then a subsequent palpation with the hand and removal of those remains must unquestionably take place.

Tears, if the patient is in hospital, are made visible with the gynæcological instruments and stitched. Then the bleeding from the tear stops. In a private house this will often not be possible; then the simplest measure, even for the general practitioner, to take instead of stitching is to plug the uterus and vagina firmly, and this by the pressure closes the tear and the bleeding vessels.

The causes of atonic secondary hæmorrhage are the same as in hæmorrhage before delivery of the placenta. Therefore, secondary hæmorrhage often occurs in connection with difficulties in the afterbirth period, and this is all the more disagreeable as the patient then has previously suffered considerable loss of blood. In vigorous massage of the uterus and the simultaneous use of pituitary gland and ergot preparations (*e.g.*, one injection each of pituglandol and sakakornin), we have very effective means at our disposal to make the uterus contract, and at the same time stop the bleeding. If this is not successful, the uterus and the vagina are packed firmly with a long strip of gauze. As the obstetrician has to put his hand into the uterus to do this, he will before packing feel with his hand and, if need be, remove remains of membranes and particularly blood clots. Sometimes this is successful, even without plugging afterwards. The packing is supplemented by a compression bandage round the abdomen.

In the manner stated, it is possible to stop any hæmorrhage, so that this occurrence is no longer so much to be dreaded as formerly, when midwifery had not yet such effective means at its disposal for checking it as we have now.

The obstetrician will, as a matter of course, not in any circumstances leave the patient until he is humanly speaking sure that no more disturbances are to be expected.



## CHAPTER XII

### ABNORMAL CONFINEMENTS

WITH the occurrences mentioned at the conclusion of the previous chapter, we have already passed over to the domain of abnormal labour. In doing so, we saw that there was no clearly defined dividing line between normal and abnormal. In what we are about to discuss now, we shall have the same experience as everywhere in nature, and particularly striking for us in regard to our own bodies and their health, that even where birth is involved, normal and abnormal courses for the most part overlap. Hence it can easily be understood that the abnormalities in one direction assume but slight dimensions, whilst in the other they may lead to the most serious complications.

To these most serious complications, we are not going to more than allude. Just as a treatise on the art of healthy living should not contain full particulars of the many and grave diseases which mankind can get, in so far as such particulars are not of use for the prevention and timely diagnosis of such diseases, so, in a book on ideal birth—the production of fine offspring and normal parturition—particulars of all the grave occurrences which may occasionally complicate delivery are out of place. Such particulars, too, would run counter to the aim of this book, which consists in the first place in making clear to women that they have nothing to fear from parturition, because attention would be drawn too much to what is unpleasant, which might seem inevitable, whilst it is quite avoidable. For we are going to establish one thing at once: as regards unfavourable possibilities in parturition, mother and child are in a far better position than man is, on the whole, when he has to face diseases. In many cases they cannot be avoided and some of them are incurable—sooner or later he



falls a victim to them. In contrast with this, all complications in parturition—with the exception of the extremely rare ones caused by malformation of the child—can be avoided, or in so far as they exist or occur can be successfully combated when diagnosed in time.

The woman in labour and the obstetrician are therefore much better off than the patient and doctor in many cases—that is, of course, only with the presumption of precautionary measures for prevention and timely diagnosis of threatened complications. As to these precautionary measures—healthy previous life, medical care in pregnancy and at the beginning of labour, the most scrupulous cleanliness—all that is necessary has been said already. Here the important thing is to get to know to some extent the abnormalities which may occur, so that we may avoid them or take measures betimes to counteract them. We are going to pass them in review with the comfortable feeling that they will not happen to us—the woman and the doctor—or at least not to a serious degree, if only we take care. But just because of this we cannot simply disregard them.

Let us divide the disturbances of the normal course of labour into those of the expulsive forces: those which are caused by the foetus and those which are to be traced to anomalies of the generative canal. Then, in addition, let us discuss a few more which do not come into this category.

The *expulsive forces* are the contractions of the uterus and the abdominal muscular pressure. Both may show abnormalities.

The most important is *febleness of labour pains*. We mean by this that condition in which the strength of the labour pains is less than the average, and is not sufficient for a normal course of labour. A relative view, as we see, which at once shows the overlapping of which we have just been speaking—a view, however, which suffices in practice. We differentiate primary and secondary febleness of labour pains. The first designation signifies that the contractions of the uterus are insufficient from the commencement of labour. If a febleness of labour pains,



after good action of the contracting force at first, is caused by exhaustion, then we call it secondary. It may occur both in the first and in the second stage of labour, and is not infrequently caused by the labour having to contend against excessive resistance. But also the general condition of the patient may bring about feebleness of labour pains.

The great demands which every parturition makes on the strength are mostly borne comparatively easily. Sometimes, however, the strength suddenly gives out: pallor, pulselessness, an outbreak of perspiration, slight or hurried breathing, attacks of faintness are like an ominous aspect of a disease. The labour pains feel agonising, their strength diminishes. The whole condition acquires a special character owing to the occurrence of lively feelings of fear. Sometimes the psychical component of this phenomenon gains strength; states of confusion then appear. The reasons at the root of this sudden change are not to be investigated here. It is not necessarily always a question of nervous women; often physical and mental overstrain manifest themselves in this way.

Ominous as such conditions sometimes appear, yet in most cases they are easy to remove. If soothing words are not enough, the influence of medicine will give help. Often one can manage with one of the trustworthy sedatives, otherwise one uses a small dose of morphia, which gets rid of this condition with refreshing sleep.

To make a primary feebleness of labour pains comprehensible, I might mention the assumption that at the end of pregnancy certain substances—"parturition substances"—increase the excitability of the uterus, that is to say, that certain chemical substances, presumed to be produced in ductless glands, cause the labour pains to be set in action. It is in keeping with our practical experience that the original (primary) insufficiency of labour pains is due either to an insufficient quantity of parturition substances or to the inability of the uterus and its nerve centres respectively to make due response to this stimulus. That actually in certain cases an insufficient quantity of ecboic substances is produced is made probable by the experience that this form



of feebleness of labour pains frequently occurs where there is ductless gland trouble. Besides this cause, everything which weakens or has weakened the uterus at the outset, such as its defective inherited disposition, or malformations of its body, scars from previous operations, inflammations, adhesion to the surrounding region on the one hand, excessive dilatation as a result of too much liquor amnii or twin pregnancy on the other hand, impair the strength of the labour pains. The insufficient contractions which may often be observed with a breech presentation, in prolapse of the placenta and occasionally also with premature rupture of the amniotic sac, are due to the fact that the normal pressure of the head on the nerve plexus, the reflex action of which stimulates the labour pains, is absent in these cases.

Of late, the existence of feebleness of labour pains due to psychical causes has been admitted. Any obstetrician can make observations of this kind. I remember a case in which the wish for the presence of the mother interrupted the labour—for a day and a half—till her arrival. In this connection the feebleness of labour pains which may result from very painful labour must be borne in mind. With sensitive women, an excessive sensation of pain impedes the labour pains; only the administration of a drug which alleviates pain can remedy the feebleness. Likewise, excessive fulness of hollow organs (bladder, intestine, stomach) may also impede the strength of the labour pains.

In the period of expulsion the abdominal muscular pressure as well as the muscles of the uterus may give way. How greatly their co-operation influences the course of labour can be observed in all obstructive changes (muscular weakness, congenital or due to very great dilatation, injuries to the nerves supplying the muscles, umbilical or interstitial hernia, obesity or pendulous belly). If this effective support is missing in the mechanism of expulsion, labour is materially retarded. Besides, it must be borne in mind that too feeble labour pains in the period of expulsion and an insufficient abdominal muscular pressure go together as a rule. Unless a strong labour pain stimulates bearing down, a voluntary



exertion of the abdominal muscles usually cannot take its place.

The patient's anxiety or simply her fear of pain is of great importance—greater here than ineffective labour pains. But the influence of the doctor and a sedative can get rid of this also.

Since "feebleness of labour pains" is such a relative conception, it is difficult to say when the obstetrician is to take measures against it. In general, a certain restraint is to be recommended. The principle of "finishing off as quickly as possible" can meet with its punishment here; and the idea that the interests of mother and child are identical with consideration for the obstetrician's want of time is not always sound. Where a too full bladder or a full rectum can be regarded as the cause of feebleness of labour pains, it goes without saying that these organs are to be emptied. Support can be given to a too flabby abdominal wall by a suitable bandage (*e.g.*, by the lying-in binder). I have already laid stress on the value of the psychological influence of the obstetrician; likewise on the importance of simple sedatives and, if necessary, a moderate dose of morphia. Less known but very easy to understand is the favourable effect of minimum doses of cocaine (5 to 15 mg.), which *Pfleiderer* recommends in extreme exhaustion during labour. Not only because the pains get stronger and follow each other in quicker succession, but also the sensation of pain grows less. Of course, this effect occurs only with real exhaustion, and not in the case of the over-sensitive, frightened, weak-willed patient who does not want the labour pains to come again because she longs for a speedy, artificial termination of labour under an anæsthetic.

Further, we often have in artificial rupture of the amniotic sac—provided that the os uteri has opened 4 to 5 cm. and the head has entered the pelvis—a very good means of remedying feebleness of labour pains. Also many obstetricians regard this interference, unimportant in itself, as very effective for *preventing* feebleness of labour pains.

Quinine has long been used as an *ecbolic*. Experimental



investigations by *Schatz*, among others, have shown that this drug has no influence on normal labour pains, but, on the other hand, that it can strengthen too feeble contractions, although not to any very considerable degree.

From time immemorial warning has been given against the use of preparations made from ergot (*Secale cornutum*) for this purpose. Undoubtedly they strengthen the uterine contractions, but do not bring about regular labour pains. Instead they cause a continuous contraction which has a rather unfavourable effect on the progress of labour, and endangers the life of the child by disturbing the placental circulation. In the afterbirth period, too, ergot may make the uterus contract in such a way that the placenta, instead of being expelled, is shut in. Hence the old obstetric axiom: no ergot preparation before the uterus is emptied. After its evacuation, the continuous stimulus which ergot causes and, above all, its comparatively long-continued effect are particularly favourable.

Since we have had hormonal preparations from the pituitary gland (puitrin or pituglandol), we have been far better equipped for dealing with feebleness of labour pains. The ecbolic effect of these specifics is comparatively slight until the uterus has begun to act of itself. But once there are labour pains, a preparation of this kind makes them considerably stronger. The great advantage with this is that the contractions do become stronger and more frequent, but they do not lose their typical character as with the effect of ergot. The alternation of contraction with relaxation of the uterus, necessary for good progress of labour and for the life of the child, still goes on. That this rule is broken if a preparation of this kind is used in the wrong way, particularly in too big doses, hardly needs mention. That happens with any comparatively strong medicine, and does not tell against it but against the way of using it. Thus we may look upon these preparations from the pituitary body, *i.e.*, preparations made from this particular part of the pituitary gland, its posterior lobe (the anterior lobe has different effects), as a typical remedy for feebleness of labour pains.



As I have already emphasised in an earlier chapter, *Temesvary* has combined the action of a pituitary preparation of this kind with that of an extract from the thymus gland, and obtained very good results from it which have been confirmed on almost all sides. Thymophysin—as this combination is called—is said to have the advantage over pure pituitary preparations of having a better effect, especially at the beginning of labour, and of being entirely un- harmful to mother and child. Nevertheless, this remedy, too, is a strong medicine which, as such, should be left exclusively in the hands of those authorised to use it. Injections of thymophysin are, I believe, combined with the administration of quinine by various obstetricians. In conclusion, I wish to point out again that thymophysin and also the other ecbolics made from the pituitary body, which have favourable properties in various respects, should not be given in the maximal doses, so that the injections, after their effect has passed off, can be repeated without risk of an overdose.

With the use of these remedies along with artificial rupture of the amniotic sac at the appropriate time, midwifery, in the opinion of many obstetricians, is far less powerless in face of insufficiency of labour pains than formerly.

One of the greatest advantages of this for mothers and babies is that it makes possible a great limitation of the cases of labour terminated by forceps.

The midwifery forceps consists of two separate, rather long, curved and fenestrated spoon-shaped blades with long handles. If the natural forces prove insufficient to expel the child, and if *Kristeller's* method of pressure exerted on the uterus from above by the obstetrician during the labour pains is unable to give the natural forces sufficient assistance, then the pull from below must come to their aid. This is done with the forceps. The patient is placed across the bed, the obstetrician disinfects his hands and gives her an anæsthetic. Then, with all the precautions prescribed by the rules of asepsis, he first puts one blade of the forceps between the child's head and the wall of the vagina on one



side, guiding it with two fingers so that it lies round the skull—for the curvature of which it is adapted—then the other blade is placed similarly at the other side of the skull. By crossing the handles, the two blades are linked in a forceps lock. Now the head is grasped between the two blades of the forceps, and the obstetrician can, by means of the handles protruding from the vaginal orifice, give the head a pull, and, if necessary, also turn the head into the proper position for birth. The doctor now makes use of this possibility. Imitating the rhythm of the labour pains, and following the normal rotatory mechanism of birth, he draws out the head and finally gets it born by lever movement.

It is at once clear how great a blessing the forceps has been by saving the lives of many children, and being in innumerable cases a real "forceps of deliverance" for the woman in labour. However, anyone who thinks it over, even if he is not trained in midwifery, must understand without further explanation that this interference has its serious side both for mother and child. The forceps exerts pressure on the foetal skull, and this in consequence does not always get off without injury. It also enlarges the circumference with which the head has to pass through the genital orifice. This is a result which is as little favourable for the mother as the more rapid dilatation of the pelvic floor and the perineum also caused by it, and which, of course, cannot be altogether avoided in such cases. Perineal tears are, therefore, more frequent and, as a rule, worse in labour terminated by forceps.

I can now use this opportunity to say a few words about the perineal tear. It is easy to understand that the perineum runs greater risk in the case of a primipara than in later parturitions when the soft parts have already been dilated by previous children; likewise, that, in an artificial delivery which, of course, always involves some force, there is of necessity more risk of laceration than in one which follows a natural course. In very bad cases, though in our time fortunately no longer very common, the tear may go through to the anus and the rectum. Tears of this kind



require very careful stitching, which must be done in a good light and with sufficient assistance, for, if the stitches do not hold, or, as used to happen not infrequently, the stitching is not done at all, a horrible defect remains, the worst result of which is inability to retain the intestinal contents. One should never allow such a condition to be left, because it not only makes any pleasure in life impossible, but also may be very injurious to health. So, if it fails to be completely cured in childbed, it must be put right by an operation afterwards.

Even if the perineal tear does not go through to the anus, and is only a comparatively small one, it must be closed by careful suture. In doing this, the deeper parts in the tear should also be brought together, and this in the case of a deep severance of tissue must be done by separate suture—for the complete restoration of the parts appertaining to the muscular layers of the pelvic floor is even more important than healing the skin. The pelvic floor should not be left with permanent injuries after delivery; its functions, of which I mention here only that of supporting the internal generative organs and hence the prevention of dropping, are too important. I therefore emphatically advise that perineal suture be not taken lightly, and would recommend women to insist on thorough treatment in this respect rather than, as so often happens, urge that the stitching of the "trifling" wound be omitted for fear of pain. Besides, the suture, like every other painful obstetric interference, if it is at all possible, should be done under an anæsthetic. In this way not only is the patient spared unnecessary pain, but the treatment, too, can be done more calmly and hence more thoroughly.

Where a perineal tear seems inevitable, or where such great internal dilatation is suspected that a rupture of the deeper layers of tissue, even without laceration of the skin, is considered probable, many obstetricians prefer to slit the perineum and those deeper parts themselves (episiotomy), whether this slit is made in the middle or towards the left or right at the back respectively. They thus avoid the danger of rupture to the rectum, and further regard the



close suture and the prospects of healing in an even cut as better than in a tear. In this matter, too, the patient must trust her obstetrician to choose what he thinks best for her. The conscientious obstetrician will in any case take care not to make use of episiotomy as part of his routine.

*Excessively strong labour pains, i.e.,* labour pains too strong in proportion to the normal resistance to be overcome, occur much more rarely than weak ones. They may bring about a too rapid expulsion of the child, which can have unpleasant and sometimes serious consequences. Where excessively strong and, at the same time, generally excessively painful labour pains occur, the patient should not delay a moment in getting to bed, else, in the resulting precipitate labour, the child may actually fall to the ground and thus suffer serious injury. She must above all not be permitted to go to the water closet immediately before, because she feels a need to evacuate the bowels. Not a few cases have been known in which the child was passed into the basin and suffocated, with all the tragic human and also penal consequences of such an occurrence.

If the doctor is present in the case of a delivery with excessively strong pains, he will, if necessary, check the tempestuous contractions, which are also abnormally painful in most cases, and give an anæsthetic in the expulsive period, and make insensibility deeper than is usual, so that he may get the chance of protecting the perineum.

In certain cases excessive readiness of the uterus to contract may manifest itself in the occurrence of a *continuous*, strong, very painful contraction. Where there is a tetanus uteri of this kind, labour makes absolutely no progress, because the lower part of the body of the uterus, the so-called "circle of contraction," is also convulsively contracted and holds the presenting part immovable. The occurrence, which however is relatively rare, is caused as a rule by unsuitable use of ecbolics, or by intra-uterine interference, such as an unsuccessful version. For the treatment of this condition, which is very dangerous for the child, a very deep narcosis is necessary.



Of the disturbances in the course of labour which are due to the *child*, we will discuss first of all abnormality in size of the child, as in this case, too, the passage from normal to abnormal is very gradual. Apart from very rare conditions, a disturbance in the process of labour as a result of the size of the child, where the pelvis is normal, is caused by its being carried beyond the full time, *i.e.*, an excessive duration of pregnancy (*i.e.*, over 280 days, calculated from the beginning of the last menstruation). This, too, is an indeterminate conception, for the exact duration of a pregnancy is never known, because the exact time of conception can never be known. Nevertheless, this term is of practical importance, for carrying beyond full time happens fairly often. Every obstetrician knows that of the fine, big children weighing more than 9 lb. or even heavier, a greater number are still-born than of those whose weight is nearer the normal weight of about 7 lb. In most cases specially big children of this kind are carried beyond full time; often it happens several times in the same woman, and in certain cases there is a hereditary or, at least, a family tendency to this. *Van der Hoeven* mentions a family in which all the sisters had fine but still-born children every time. In many cases, the death of the child may be due to difficulties in labour owing to its size, but it also happens that the child has died earlier. We do not intend here to go into the hypothetical explanation of this death given by *Van der Hoeven*. It is sufficient to be mindful of carrying beyond full time, and to take steps against it, shortly after the calculated end of pregnancy, by starting labour artificially (by means of puncture of the membranes, quinine and pituitrin or thymophysin respectively).

We have in twin and multiple pregnancy a further unusual condition, which may, but certainly need not, lead to disturbance of the process of labour. We may mention as a curiosity that, according to a formula given by *Hellin*, there is one twin birth in 80 births, one triplet in  $80 \times 80$  and one quadruplet in  $80 \times 80 \times 80$ . Meanwhile, it is much more important than this formula to know that the capability of begetting twins is hereditary.



Multiple pregnancy in itself need not be regarded as a complication of confinements. To be sure, disturbances in the pregnancy occur oftener than usual, due to various factors, of which the abnormal size of the uterus is the most noticeable. It is this very great dilatation of the uterus, too, which may impair the process of labour, because the excessively stretched muscular fibres of the organ are not capable of strong contractions. There are other possibilities of disturbance; for instance, abnormal presentations and the circumstance that the children get entangled with one another and thus block the way out each for the other.

Who would deny that for these reasons, as well as to prepare the patient and her family, the diagnosis of twins is best made during pregnancy? More than twins will probably almost always come as a surprise. This diagnosis in the first months is impossible to determine exactly, although even thus early the rapid growth of the uterus may arouse suspicion. Until a few weeks before the end of pregnancy external examination cannot give the diagnosis, and from then the diagnosis is made only by reason of the comparatively great increase in girth, by the evidence of at least three instead of two "big parts of the foetus" (these are the head and buttocks), and by hearing cardiac sounds at opposite places in the abdomen, in which the beats vary in number. The earliest, surest and most convenient proof of twins is by X-ray examination, which can be done nowadays without danger to mother and child, and gives clear photographs as early as the fourth month.

If the two conditions mentioned already show how important obstetric care in pregnancy is, then we shall realise its still greater importance when it is a question of ascertaining the presentation and position of the child before the beginning of labour. To be sure, the less serious deviations from the normal position can generally not be recognised by external examination during pregnancy.

Let us consider briefly the abnormal presentations and positions of the child and their significance for labour. Normally, the child lies in the longitudinal position with the head so much bent that the back of the head is born first.



Now sometimes, instead of being in the bent attitude, the child may be in a more or less extended position, whether as regards the neck or in respect of the whole body. In the latter case, with the face presentation, there is even curvature backwards of the foetal trunk.

The mechanism of labour with the face presentation proceeds in an opposite way to the course of things in occipital presentation. In the former case (in face presentation) the greatest extension of the head ; in the latter case (in the occipital presentation) the greatest curvature ; in the former presentation, the abdomen rotates forwards ; in the latter, the back ; in the former, the chin, and in the latter, the occiput rotates towards the pubic symphysis, at which point of rotation the rest of the head is born. In face presentation the head has to pass through the pelvis with a greater diameter or circumference, and so birth can take place only with a considerably greater expenditure of force, and consequently longer duration of labour. The prospect of a spontaneous termination is less in these circumstances, mother and child are exposed to all dangers to a far greater extent, and where there is an otherwise insignificant disproportion between the size of the head and the breadth of the pelvis this may have a dangerous effect.

In a number of cases this abnormal presentation already exists during pregnancy, and can be determined by external examination before the commencement of labour. The obstetrician can try to change it to a normal presentation by certain manipulations, yet it is in these cases that the abnormal position is mostly caused of necessity (owing to rather too short cervical muscles), so that his efforts are bound to fail. One advantage, however, timely diagnosis does have : the patient can still go to hospital before the commencement of labour, and there she is better looked after than at home.

In other cases, the face presentation occurs more " by accident," or a not very good frontal presentation is changed during labour into a face presentation. The obstetrician will have to adapt treatment to the peculiarities of the indi-



vidual case. Sometimes an attempt at changing it to the occipital presentation may be successful. In other cases, where labour is further advanced, version to foot presentation, followed by extraction, comes into consideration. In some circumstances the obstetrician will even prefer delivery by operation. In any case, however, it is of great advantage that the abnormal position should be diagnosed as early as possible, and the gynæcologist called in without delay.

So far as the frequency of the occurrence is concerned, among abnormal presentations and positions the pelvic or breech presentation is most important for the patient and for the obstetrician. In this it is not so important whether the feet (or one of the feet) are along with the breech. I have already pointed out in the first section of this book that delivery in the pelvic presentation is less favourable than in the occipital presentation. With the head presentation the widest part of the child has prepared the way through the genital passage for the body to follow. In the pelvic presentation, on the other hand, the following head has to pass through the genital passage, which has been only insufficiently dilated by the trunk, so that the birth of the head, particularly in primiparæ, is retarded. As the supply of oxygen through the umbilical cord is interrupted meanwhile, there is a risk of suffocation for the child. The obstetrician must therefore make certain manipulations to release it from its position of distress. In such cases he has not an easy task. Although in most cases he is able to fulfil it successfully for both mother and child, yet it is really better if he is given the opportunity to diagnose this abnormal position during pregnancy, for at this stage it can be changed by external manipulations to a head presentation without great difficulty, a manœuvre which is no longer possible once labour is in full swing.

Whilst the prospects for a living child in the abnormal presentations and positions described so far are not definitely bad, the transverse and oblique presentations must be considered absolutely unfavourable, as birth in



the natural way is not possible unless the axis of the child can be brought to coincide with that of the uterus. If the transverse presentation is left to itself, the issue is fatal. The amniotic sac, which is exposed to the direct pressure produced by the labour pains, ruptures prematurely in most cases, and when this takes place usually an arm prolapses, sometimes the umbilical cord as well. Owing to this, the foetus is bent, the arm and the shoulder appertaining to it become the presenting parts, the head lies on one side of the pelvis, the body on the other. The uterus then strives to overcome the resistance by increased labour pains, it draws back over the foetal body, becomes thin in its lower section and threatens to rupture there. The foetal body, clasped close by the uterus, is in the dreaded condition of unreduced transverse presentation. Mother and child are lost unless help is given with the utmost speed. All this can be prevented if the doctor is able to interfere *at the right time*. With the patient under an anæsthetic, he will put a hand into the uterus, get hold of a foot, bring it down, and, by external manipulations with the other hand and a *slight* pull on that foot, do the version, which he follows by the extraction of the child by the foot. As a rule, given the timeliness just mentioned, he will be able to carry out this interference with entire success for mother and child, especially as the transverse presentation occurs almost without exception in multiparæ whose genital passages are sufficiently wide to admit of comparatively easy manipulation. However, in this case, too, it must be pointed out that this very dangerous presentation can be successfully treated in pregnancy. External version presents no difficulties, the child is brought into a longitudinal position without injury, and can be kept in place by firm binders.

This particular abnormal presentation shows most strikingly the value of examination in pregnancy. The experienced obstetrician often recognises this abnormality at the very first touch—indeed, with the first look at the abdomen—and his help gets mother and child past this danger.



Of the anomalies of the genital passages which may interrupt the end of delivery, we are going to mention here only the *contracted pelvis*. There are also, it is true, abnormalities of the genital passage in the stricter sense of the word, that is to say, the cervical portion of the uterus, the vagina and the vaginal outlet—scars, tumour formations, disturbances of development—which may impair the smooth course of delivery. They are, however, not of such great practical importance as those of the bony canal formed by the pelvis which the child has to pass through.

We have already seen that in many cases the “narrow pelvis” is a relative term because it depends on the proportion between head and pelvis. An almost normal pelvis may be too narrow for a big, hard head, and one which is difficult for a normal head lets a small or very soft head through. Nevertheless, a narrow pelvis is an unpleasant possession for a woman, and it can give the obstetrician a great deal to do.

The most important forms encountered are the generally contracted pelvis, the flat pelvis and the pelvis contracted at the outlet. Of these, the flat pelvis—in which the diameter from back to front of the pelvis is shortened—is most important, just because of its frequency. This frequency is due to the great number of children who suffer from rickets, for rickets leads comparatively often to this form of pelvis. Fortunately, the advances in vitamin research make it possible for us to prevent or to combat it effectively. Great value must therefore be attached to this prevention, also as regards the later capability of child-bearing.

If pelvic contraction exists, then the most important thing is timely recognition. “Timely” means here “best of all before pregnancy, indeed even before marriage,” but, otherwise, during pregnancy and not only in labour. If the narrow pelvis has not been recognised before labour, then diagnosis should at least be made possible at the commencement of the act of delivery, for the prospects for mother and child are far better if labour has not been protracted.

What it means when a comparatively hard body has to pass through an almost inflexible ring anybody can



imagine. Nature, it is true, has at her disposal a certain possibility of compensation; but in this case it has not very wide limits. With pelvic contraction, according to the degree of disproportion and to some extent also to the power of the expulsive forces, parturition shows the whole range of obstacles to delivery which lies between an almost imperceptible retardation and the absolute impossibility of a spontaneous termination, and requires all the obstetrician's skill, experience and knowledge. The measures he takes—provided that he is not called in too late—to bring the delivery to a successful termination for mother and child, in spite of all difficulties, range from the simple arrangement of a position of the patient which will promote the passage of the foetal head through the pelvis, the suitable use of ecbolics on the one hand and narcotics on the other, and, finally, the typical obstetric interferences, such as version and forceps (or lesser interferences if need be) up to operations, such as Cæsarean section and pubiotomy.

Women in labour who have a contracted pelvis should go to the obstetric department of a hospital. As regards the best possible asepsis of their sexual organs, as well as the supervision of the position of the child and the proceedings in the very first stage of labour, they should be recommended urgently to get admitted some time beforehand.

I have now to make a few further observations on two serious disturbances of the process of labour which, however, may also appear before the labour begins: they are *hæmorrhage* and *eclampsia*.

Hæmorrhage may occur at any time during pregnancy and labour. In any circumstances, it is a symptom which must be treated seriously, and requires two measures to be taken at once by those concerned: absolute rest in bed and calling in the doctor.

In the first months of pregnancy hæmorrhage, even if it is very slight, will indicate that a miscarriage is impending; later, hæmorrhage may be a sign that pregnancy is going to end prematurely. Hæmorrhage in the last months of pregnancy may, however, also be a sign of faulty site of attachment of



the placenta. If its site of attachment is not, as is normally the case, in the upper part of the uterus, but in the lower section, then, with the slow dilatation of this section which begins in the last weeks of pregnancy, small blood vessels are ruptured, and these cause the hæmorrhage. This is not bad in itself, but it may be the premonitory symptom of greater disorders—disorders which are generally of a very serious character if the placenta covers the orifice of the uterus (presenting placenta). In cases of this kind, too, medical skill can interfere successfully, yet here again the important thing is to get the patient into an obstetric clinic in time—*i.e.*, immediately after the first symptoms—where medical assistance is at hand at any time, and one has every remedy at one's disposal.

Finally, eclampsia : as we have already seen, the metabolism of pregnant women undergoes considerable changes in consequence of alterations in the functions of certain organs and of the increased strain owing to the presence of the child. Increased demands are made on the kidneys particularly, which they are not always equal to. The first sign of their failure is given by albumen in the urine. This, by itself, does not indicate disease, but must be taken as a warning. Consequently, the urine of every pregnant woman must be examined regularly in the last months of pregnancy. A light diet, and regulation of the way of life in the direction of reduced physical exertion, prevents aggravation of the condition. If the disorder has already assumed more serious forms, then the patient must have absolute rest in bed and a strict milk diet followed, if necessary, by a saltless diet without stimulants. If this is neglected, then unconsciousness with violent convulsions may suddenly occur. Eclampsia is one of the most ominous conditions of disease in pregnancy and labour. It brings the life of the mother and child into serious danger, and sometimes requires the most serious medical interference. Yet its prevention is comparatively easy and certain. For this, only regular care and conscientiously following any orders the doctor may give with regard to rest in bed and diet are necessary.



To sum up, we are going to make a statement that is at the same time comforting and a warning. By far the majority of troubles in the process of labour can be avoided, where there is regular supervision during pregnancy, by simple medical measures. And such troubles as do arise will be limited in extent if the woman gets treatment at the right time.



## CHAPTER XIII

### CHILDBED AND THE CARE OF THE LYING-IN WOMAN

MANY people believe that after delivery has taken place, attention need be given to the child alone, and all danger for the mother has been got over. She is allowed to have some further rest so that she may recover from the great exertion she has gone through ; but the majority of husbands think it quite right for the wife to take up her ordinary duties again after a few days. There are even races amongst whom the husband does the lying-in to recover from the fright, whilst the wife gets up as quickly as possible and has to work again. Among women in the country, it is not unusual for them to be standing cooking the next day ; and the gipsy woman has her confinement in the ditch by the side of the road and then runs after the cart again. They have to pay for behaving in this way. Insufficient care in childbed brings premature old age ; it may also, however, have immediate harmful results. The female body needs from six to eight weeks for full recovery ; in these weeks the woman must spare herself and have regard for the needs of the body in her way of life.

Even after a normal pregnancy and childbed, some symptoms are left which indicate to the gynæcologist that a birth has taken place. These changes, however, are to be regarded as normal, and do not impair the woman's health in any way ; indeed, she will generally have no knowledge of them at all. If everything else is to return to normal, and the woman to regain her full functional capacity and vigour, then careful nursing and much rest are necessary during the lying-in. To be sure, we rightly regard birth and childbed as natural processes. Nevertheless, childbed is a condition which is not far removed from illness, and by no means seldom turns into actual illness.



The inner surface of the uterus, after the separation of the afterbirth, constitutes a big wound surface, and like other wounds has to heal. As in every other wound, blood is discharged from the uterus at first; then watery blood-plasma with numerous white blood-corpuscles. This discharge is called the lochia. In the first two days after delivery blood and little clots of blood pass; from the third day the discharge becomes brownish, then more yellow; gradually the quantity decreases, and finally only a watery mucous discharge is left. Naturally, the duration of the discharge is subject to individual fluctuations, just as its character varies; but, in general, one may say that the lochia should flow abundantly in the first week, and ought not to have a bad smell. Not only must the nurse pay attention to the rate and character of the discharge, and at once report any changes to the doctor, but the doctor himself (or the midwife) will supervise the dressings (cotton wool, cellulose, gauze, sterilised towels). The dressings, which must be changed several times a day, should not be touched with the fingers, for the lochia must be regarded as infectious. How great its infectiousness may be is clear from the fact that touching a used dressing with a finger, on which there is an abrasion that is hardly noticeable, easily leads to a purulent inflammation of this finger. The lochial discharge is especially dangerous for the navel of the new-born child; therefore, it is to be regarded as a fixed rule for the nurse to see to the child first and then the mother. The lying-in woman should avoid most scrupulously touching the region of her sexual organs with the hands, both because she may thus bring germs of putrefaction there, and because infectious matter might be taken from there. Reduced to a brief formula, it may be said: the sexual organs of a woman in childbed can easily be infected, and the discharge from them is infectious. For both reasons, they must be regarded as a "*noli me tangere*"—a law which may be broken, and has to be broken, only for cleansing by the nurse.

The uterus, which immediately after parturition shows a weight of about 2 pounds, has, in order to regain its normal



weight of 2 or 3 ounces, to diminish to a fifteenth of the former weight. This process generally takes place fairly quickly ; as early as ten days later the organ, which immediately after delivery could still be felt as a big ball below the navel, is no longer palpable from outside. Then the change back goes rather more slowly, and the normal size and condition is not reached till after six or eight weeks. The involution is considerably accelerated by nursing ; hence it is not only to the interest of the child, but also to that of the mother to give the new-born babe the breast. Just as the growth in pregnancy is caused by hormonal influence, the involution of the changes which have taken place is under hormonal influence. The ovaries resume their ordinary activity after some time ; however, the recommencement of menstruation cannot be foretold definitely. With women who do not nurse the child, the first menstruation occurs as a rule after about six weeks. With about a third of the nursing mothers, the first period occurs within the first two months in spite of nursing ; in only about half of the total number of cases, the woman first menstruates again at the end of the nursing period. As soon as menstruation sets in again, or, to be more precise, a few weeks earlier, there is a possibility of a fresh pregnancy. Hence two children may be born within a calendar year. *Labhardt* tells of a woman who gave birth to five children—once twins and once triplets—within a year. As a rule, a nursing mother who has not menstruated again is incapable of conception ; yet exceptions to this rule are not uncommon. Elderly women may cease to menstruate altogether after a confinement ; that is, they pass into the “ change of life ” without transition.

Not only the ovaries and uterus have to change back, the satisfactory involution of the vaginal walls, and the muscles of the abdomen and of the pelvic floor, is just as important for the woman's well-being. In general, vaginal wounds which may be made in parturition do not bleed very much ; they heal by themselves without treatment in most cases, and are seldom recognisable later. The vaginal walls, which have had to be greatly expanded in a short



time, often remain a little stretched, and the same can be said of the pelvic floor. Damage of this kind can, however, be prevented to a great extent, or remedied by suitable pelvic exercises. The exercises for this purpose should begin early, and be carried on for some time. Most is to be expected from them when the woman has been accustomed to them beforehand. But, if tears in the muscles of the pelvic floor have occurred in parturition, then no satisfactory result is to be expected even from the best exercises. Tears of this kind should be thoroughly stitched immediately after delivery. If this is neglected, then it must be made up for later by an operation.

The abdomen must be compressed immediately after delivery by putting on a stiff binder, the effect of which is to be further assisted where necessary by some packing or by putting on a sandbag. The effect of an abdominal binder of this kind extends both to the abdominal contents, which have, as it were, suddenly got too much space, and to the abdominal walls which it supports, protects from stretching, and the muscles of which it forces to retract. A good binder in childbed does much towards strengthening the abdominal wall and regaining a slim body. There are very many different patterns of these binders, all of which have their advantages. A great deal can be done simply with a piece of linen, folded into a suitable shape, drawn tightly round the abdomen and fastened skilfully with safety pins. An improvement on the linen binder, the "Gurita," has a great number of strips of linen which are fastened together in pairs. The best one now seems to me to be that recommended by *Bumm*, which is about 6 yards long, 6 inches wide, and made of rubber material. It is fastened with clasps. All these binders must cover the os pubis below, and the thorax to just below the breasts above. Just as in pregnancy a gentle massage of the skin of the abdomen is useful, so also in childbed the same thing may be done again now. Exercising the abdominal muscles, however, is more important than massage of the skin. This should begin early, and be carried on during the whole lying-in and beyond it. In conjunction with



breathing exercises, suitable movements of the arms and legs involving the rest of the muscles of the trunk, together with the above-mentioned exercise of the muscles of the pelvic floor, constitute the gymnastics of childbed, on which we must lay great stress. The exercises should be carefully regulated to suit the strength and condition of each patient. They can be partly passive and partly semi-active resistance exercises, which make all kinds of transitions possible. Light massage of the back and extremities by someone specially trained for this, combined with these exercises, is, in many cases, to be specially recommended, and by women is considered exceedingly beneficial. Yet in all this physical culture in childbed, great care must be taken to avoid any over-exertion. The patient should not feel at all tired by it, but merely feel it a beneficial influence on her condition; otherwise she has done too much. In general, one should be cautious with active exertion in the first days, and, where there is good assistance, devote oneself more to the passive movements and light massage, then pass gradually to greater—but never too great—exertion. The abdominal muscles should, however, have active exercise from the beginning with the binder on. This is more easily done with the elastic binder than with the others.

The stria after pregnancy, which have been reddish-blue in the last weeks, become paler and narrower, but disappear altogether only with a healthy constitution and appropriate care before delivery. The brown line which ran from the os pubis to the navel, and was of value as a symptom of pregnancy, gradually disappears like the other discolorations of the skin. The umbilicus draws back again, and in the end the whole abdomen regains its normal appearance. Sport and gymnastics will do their share later to accelerate and perfect the restoration. Until the muscles are strong enough to resist the inner pressure of the abdominal viscera, the young mother should go on wearing a corset after childbed, and one that gives support and not one that confines. For this purpose, I find the elastic



belts best, as a light massage is constantly going on as a result of the pressure of the elastic tissue.

The changes which have to be mentioned are not confined to the abdomen and the abdominal organs only. The woman's whole body has been taxed by pregnancy; and therefore all the organs now share in various degrees in the change back. The intestine seems almost paralysed in the first days; it is necessary to help it to resume its activity and to see that there is regular and thorough evacuation. Hence it is customary to give an aperient (castor oil is still the best) on the second or third day. It must be remembered that the abdominal walls have been enormously stretched, and therefore the abdominal muscular pressure has not yet regained the strength to help on the contents of the intestine sufficiently. The intestines, too, had adapted themselves to the reduced space—which they had had during the last months of pregnancy when the uterus took up almost the entire space in the abdomen—and now all at once they have had to get used to the great increase in space and reduction of pressure. In addition, the tissue round the anus has been stretched owing to the passage of the child, and the nerves crushed by this are not yet reacting normally again.

Similarly with the bladder. The constant stimulus to micturition, which there has been in the past week before delivery, has gone, and in this case, too, the fine nerves are injured. Consequently, it often happens that in spite of the bladder being full, there is no desire to empty it, but in coughing, laughing, and so on, an involuntary escape of urine takes place. Attention should be paid to emptying the bladder, for an over-full bladder is detrimental to the involution of the uterus, and may also cause a displacement. Defective evacuation of the bladder, too, is not infrequently the cause of an infection of its contents, and thus of cystitis. An infection of this kind may easily occur if the bladder has to be evacuated artificially (by catheterisation). Therefore, every possible effort must be made to get the lying-in woman to do the evacuation herself. Certain devices or



tricks, such as the noise of running water, may be helpful to her in this. It is best, however, if the patient acquires by practice *beforehand* the power to empty the bladder in a recumbent position, and to empty it *completely*, for many women and girls have the bad habit of not emptying it right out, a habit which can be very harmful to them in illness or childbed. After the first days of lying-in, the functions of the bladder and intestines are generally restored again without any disorders or damage being left.

The respiration of the lying-in woman is normally calm and regular; sometimes, however, it is superficial simply because the lying-in woman—like many other people—forgets to breathe, as it were. As deep respirations improve the interchange of gases itself as well as promoting the circulation of the blood, and both are important for the lying-in woman, it will be wise, apart from the actual breathing exercises, to bring to her notice from time to time her “forgetfulness” in this respect. Here again, however, it is best if the patient has become accustomed beforehand to carry out this natural but, just because of its naturalness, much neglected function well.

The pulse is rather variable in character. People used to speak formerly of a puerperal pulse. There are teachers in medical clinics who do not admit this pulse—wrongly, I think. Meanwhile, it is certain that the slightest physical or mental strain can produce changes in the pulse beat and the character of the pulse. This is comprehensible, for owing to the shifting of the equilibrium of the body, the loss of blood in parturition, and the increased metabolism due to the processes of involution and nursing, there is a great strain on the heart, and the circulation is altered. Also childbed, as I have already emphasised, is a condition midway between sickness and health, which sometimes inclines more to the healthy, sometimes more to the diseased. The readily variable temperature, too, supports this view. Characteristically, many and very distinguished medical teachers speak of fever only with temperatures which rise above 100° F. Thus, *Stoeckel* says in his text-book on mid-



wifery: "For childbed, a temperature of 99.4° F. is fixed as the upper normal limit, because the resorption processes in the uterus so often cause rises to this limit so that they should be deemed a normal manifestation. But these slight rises may, of course, be the initial temperatures for an incipient infection; hence they are never unequivocal, and must not be regarded in advance as positively without importance." Other obstetricians, however, think the upper limit mentioned as normal for the temperature in childbed is wrong. I, too, have always been accustomed to consider a temperature above 99.4° F., taken in the armpit, suspicious, or, at any rate, "uncomfortable," but I am willing to admit that "fever" is not an exact term, and therefore this word need not yet be used for such temperature. Whether a slight rise in temperature is the symptom of an infection can, of course, be determined in cases taking a less favourable course, but not in cases of a quick return to normal, for the term "infection," too, is not an exact one. Nobody can say, for instance, whether a transient rise in temperature, as a result of a temporary congestion of the lochia, is due to the resorption of poisonous lochial products, or to an invasion of bacteria—that is, to a real infection—which, however, will be quickly overcome by the defensive powers of the organism. And as to the cause and significance of the rise of temperature which sometimes accompanies the "shooting in" of the milk, we are still more uncertain. One thing, however, is certain: any rise in temperature is a reminder to the obstetrician in charge of the case to pay attention, and to be doubly watchful. This is all the more so if the rise of temperature is accompanied with acceleration of the pulse. For, to quote *Stoekel* again: "any acceleration of the pulse, even the anæmic, may be the first symptom of a puerperal infection; careful supervision of the pulse is therefore the most important thing in childbed, and the best means of early diagnosis of an approaching puerperal fever."

I cannot regard it as my business to discuss puerperal infection here—its dangers, its fatal effects, and still less



need I bring the extremely difficult question of method of treatment of puerperal fever into our consideration. Only this much may be said: puerperal infection still constitutes the greatest danger to which mothers are exposed. Unfortunately, we have not yet at our disposal methods of treatment with which we can attack puerperal fever in its various forms satisfactorily. We do know the way to avoid the disease. It is *cleanliness*—cleanliness in the medical sense, *i.e.*, asepsis; but also the most scrupulous cleanliness in the ordinary sense—cleanliness before parturition, during parturition and in childbed—cleanliness, above all, with regard to the sexual organs, or anything that comes in contact with them, hands, dressings and instruments, washing utensils, the genitals themselves and everything about them.

The breasts undergo a very great change in the way of development. As a result of hormonal action aroused by the birth which has taken place the milk secretion appears. In the first days still very scanty; on the third or fourth day of childbed an abundant secretion in excess of the needs of the child sets in almost suddenly. This suddenly starting function of the mammary glands may cause considerable trouble. The breasts are filled till they are as hard as stone; they are flushed and painful. The child cannot yet by any means consume the glut of nourishment offered to it all at once. Often cold compresses and aperients have to be administered to give some relief; after a few days, however, the milk production becomes regulated in accordance with the ancient economic law of supply and demand.

Everyone who has reviewed with us in the preceding pages the main changes which the body has to pass through in order to regain its former state, and to meet the new demands made on it, will understand why rest must be insisted on in the care of the lying-in woman. In a short six weeks, all that had been changed during nine months, and by labour, has to change back again; the lying-in woman has to recover from the strain of labour, but at the



same time, she has also to be giving the child strength and nourishment.

Strangely enough, it is generally the very women who have themselves had experience of parturition and childbed, the mothers and mothers-in-law, who have least consideration for the need, the necessity, of rest for the lying-in woman ; and the sisters, cousins and friends also disturb the peace of the lying-in room only too often. Then it is the doctor's business to keep firm control !

The lying-in woman, in spite of the great exhaustion and need of rest, generally sleeps badly in the first few nights. The last vibrations of the greatest of all experiences are still too strong—giving life and losing life border very closely on one another. There will hardly be a woman who, after delivery, has not consciously or unconsciously the feeling that she and her child have been touched by the dark shadow of the angel of death. But as life is always dear, when one has escaped a danger by the skin of one's teeth or has attained an object striven for with the last ounce of strength, so also is the rest after delivery the finest hour for a mother. The reaction which takes place in her, the awakening of her maternal consciousness, is a process which not even a poet can comprehend, and even a poetess is unable to express fully ; it is the hour which can make a saint even of a prostitute.

Seen thus, it is not surprising that almost every woman soon forgets the pain she has undergone, and even after difficult and painful labour says, " it was not so bad after all." All fear is wiped out, all paltriness gone ; peace has entered into the body wracked with the pains of labour only a few minutes ago. Then her thoughts keep her from sleeping ; the miracle must first be understood, the experience of birth must be thought over, the return to life savoured. The child with its needs, its touching helplessness does most to initiate her happily into her new tasks, to make the way back to ordinary life easy for her. Therefore, the child should not be taken away from her at once, however great her and the babe's need of rest. She wants a little time alone with her baby to realise the experience. In the



following days, too, the mother should have the chance to see her baby and take pleasure in it. She should be allowed to hold it in her arms not only five times a day at feeding times, but she must also get the chance to have it in between, to stroke its head gently, to study its features and to admire and marvel at its tiny hands.

In order to be able to give her child proper nourishment, as well as to restore her own physical strength, the young mother needs abundant and nourishing food. Immediately after delivery, she should get as much as she wants to drink, and in the next few hours, too, the often very great thirst has to be overcome by giving plenty of liquid in the form of milk and tea, or even of fruit juice. Hunger sets in again only gradually, but by adding a reasonable amount of sugar drinks can also be made nourishing. Fresh bread, fatty or farinaceous foods, pulses, all kinds of cabbage which cause flatulence, and raw vegetables, with the exception of lettuce, are to be avoided. Fresh-steamed vegetables and fruit, salads, dried figs and nuts should be included in the diet of the nursing woman in childbed. Meat dishes are allowed once a day; unpolished rice and wholemeal bread are to be recommended. However, after the first few days, when easily digested invalid diet is still rather indicated, the patient can eat what she likes.

In the care of the body, stress must again be laid on the utmost cleanliness. Vaginal douching—unless ordered by the doctor—is forbidden; on the other hand, after every evacuation on the bedpan, irrigation of the external genitals with a disinfectant solution should take place. Many obstetricians have the lying-in woman sit on a night stool even at the first evacuation. This and similar early movements do not do any harm to most lying-in women, but are, on the contrary, conducive to the prevention of embolism (obstruction of vital blood vessels). It is better, however, to provide the moderate amount of movement which is desirable for promoting the circulation of the blood, and to prevent this dread disturbance of circulation, by the above-mentioned exercises. One should also allow the patient freedom of movement within certain limits while she is in



bed—sitting-up in bed, etc. In any case, obstetricians have changed from the "absolute rest in bed" which they used to prescribe for their lying-in patients. This precaution is now recommended by the doctor only in special circumstances. Then, however, he has special reasons for it, so that in such cases freedom of movement must unquestionably be given up.

On which day of the puerperium the patient is to get up will generally be made to depend on her general state of health. For quite a large proportion of women, not only in the poorer classes, childbed is the only time when they can really get a thorough rest. The obstetrician who lets them get up too soon in this case does them a wrong; they have to recover not only from parturition, but to fit themselves for ordinary life and to gather fresh strength.

The rest which women need in childbed is no less mental than physical in its nature. This rest, which does not preclude preoccupation with a good book, must, if necessary, be imposed on the patient even against her will. Visitors should be limited to a minimum; the patient must have the feeling "during the next two hours, nobody is coming to disturb me, unless I ring. I can sleep or read or dream, just as I like." For it must not be forgotten that the young mother needs quiet and time for dreaming. Later, ordinary life will claim its rights again; the care of the child, which can be taken off her shoulders now, will tax her strength, and little time will be left for meditative happiness in her being a mother. Then let us grant her rest in the first few weeks. It is all the same whether she is a working woman or a queen; she is now a mother!



## CHAPTER XIV

### COMPLETE RECOVERY

A BOOK on pregnancy and labour would not be complete without the very important chapter on recovery. In spite of the fact that I agree with all the obstetricians in the world that pregnancy in itself is a normal function of women, and a normal physical process which is in nowise to be considered diseased, yet this assumption really holds good only with certain reservations. Pregnancy and delivery are healthy processes, but they present an exceptional condition nevertheless. If a builder builds a house the process of building, too, is normal in itself; and yet, in order that the house may fulfil its destiny, the work of building must be terminated, the exceptional condition has to be brought to an end. When a woman has given birth to her child, and has finished the puerperium and the nursing period, then only has she brought the exceptional condition to an end so as to be able to do justice to her further duty as wife and mother.

This return to the normal condition has to take place in two ways: first in the physical, and then in the mental-psychical way. Now let us consider the physical return to the normal first. All that is essential has, it is true, been said in the preceding chapter; yet it must be emphasised again that proper care, and the proper conduct during pregnancy and childbed, are decisive for the restoration of the physical beauty and functional capacity.

Many earlier generations believed that it was not very necessary for a "mother" to bother about these factors. Our point of view is different nowadays—on the one hand, in the interest of the physical efficiency of the woman herself; on the other hand, because we know that the preservation of marriage and conjugal happiness depends



not least on the erotic power of attraction, to some extent physical, which a wife has for her husband, or which she recovers again after its having been impaired by pregnancy.

To accomplish this purpose a great deal can be done by systematic physical culture. It comprises cosmetic expedients of the most varied kind (details of which cannot be given here, especially as they are within the reach of only a comparatively small number of women) as well as physical exercises. The latter can be divided into general gymnastic exercises, which again can be supplemented gradually by suitable exercise in sport, and special exercises suitable for the latter part of the lying-in period and the period following it. Such exercises I have described and recommended for the restoration and strengthening of the muscles of the pelvic floor in my book: "Sex Efficiency through Exercise." \*

It cannot be stated as a general rule at what time the use of plunge and hip baths can be resumed. Usually, however, it is about fourteen days after delivery. But the decision must be left to the obstetrician.

The patient, in my opinion, should remain under medical care for at least two weeks, and at the end of this period should have a thorough gynæcological examination. This examination should extend to the condition of the external sexual organs and the vagina, to how far the various tears, if any, have healed, and to the firmness of a healed perineal suture. Furthermore, it should include the condition of the uterus—especially its portio vaginalis with the os uteri—the degree of involution and the position of the organ. The doctor will decide, from the results of this examination, whether the patient can do without further treatment, or must continue to be kept under observation. It is best in any case to repeat the examination in six to eight weeks' time, that is, after the period of involution is over. I cannot too urgently recommend women—whether they have just been having their first child or already have several children—to undergo these examinations, for they are

\* William Heinemann (Medical Books) Ltd.: London, 1933.



exceedingly important for the avoidance of later troubles, such as prolapses, discharge, etc. Likewise, the patient who has had her confinement without a doctor—that is, under the care of a midwife—should go to her doctor, or to a clinic or obstetric advisory board for examination. Any injuries or weaknesses which may still be present can then be diagnosed, and the necessary treatment begun at once. If everything is as it should be, the patient has the comforting feeling that she need not be careful of herself any longer. Meanwhile, the doctor will in most cases no doubt give some advice as to what she may or may not do in the ensuing period.

This advice will have to have reference also to the resumption of the conjugal life, and that in two directions. In the first place, there is the question of conjugal intercourse itself. It may take place again as soon as it will do no harm. The harm which it can do—assuming that there is no danger of “diseases of the genitals” to be feared—consists in rupture of the still tender vaginal walls, or of wounds which have just healed, infection of the uterine mucous membrane by germs of putrefaction being introduced, and in hæmorrhage. The first depends on the actual condition of the vagina; the second is not to be feared if the os uteri and the cervical canal of the uterus have closed up sufficiently, whilst the third may be regarded as out of the question if the lochia has not been abnormally bloody and the uterus has contracted normally. Besides this, it is of considerable importance whether the husband can be trusted to have a certain caution and consideration, and whether the cleanliness of both husband and wife can be relied upon.

Finally, it is scarcely necessary to say that the psychological state of the husband and wife concerned deserves deep consideration in answering the question under discussion; yet experience teaches how little it actually is considered generally. The obstetrician can, of course, choose the safest way in regard to the body of his patient by forbidding sexual intercourse till the whole process of involution is finished—although in doing so he does not take into account the fact that moderate sexual intercourse promotes this very



process. The objection to such an exclusively physical consideration of this often difficult problem, however (apart from the non-observance of the advice given, and the consequent danger that then also the rest of the doctor's advice will not be taken seriously), lies in the neglect of the other factors which are, in many marriages at least, just as important—a neglect for which the woman may suffer bitterly. Therefore, just as decidedly as I advise against assuming conjugal intercourse before the medical examination, I advise urgently, on the other hand, that this matter should not be settled with a few words in passing, but should be dealt with in a proper discussion between the wife, or the husband and wife respectively, and the doctor.

The medical examination before the resumption of conjugal life has still another purpose. I said in the last chapter that nursing does not prevent a fresh conception, as is popularly supposed. I have also mentioned in the foregoing my view that pregnancies should not come in too quick succession, first in the interests of the woman, whose power of propagation is greatly abused by pregnancies following one another too quickly, as by the excessive strain her body may become prematurely old and worn out, perhaps even diseased and sickly, and secondly in the interests of the children and the family also. Hence a woman should consult her doctor as to how quickly pregnancies should follow each other in her case, and what she should do to put off the next pregnancy till a favourable time. The general opinion is that there should be an interval of two years between births—*Sellheim* wants even three. In isolated cases an interval of from three to six months after the end of the nursing period may be sufficient to restore the woman's strength, so that the beginning of a fresh pregnancy might be welcome. This holds good in particular for those women who, healthy in themselves, have not had their first pregnancy till comparatively late, but have gone through it without any special difficulty, and now have an urgent desire for more children. In such a case, they should not let themselves be discouraged by considerations to the contrary; experience shows that a



woman who has a great desire for children has them more easily, and recovers more quickly, than one to whom they are a duty and an obligation.

The doctor should recommend measures for the prevention of pregnancy to suit individual cases. I cannot too earnestly advise against consulting chemists and other similar persons not specially trained. I must give equally strong and urgent warning against the interruption of a pregnancy, which may have occurred in spite of every precaution. The harm which might result to a woman from births in too quick succession is, as a rule, very much less than that with which she is threatened when unauthorised or even trained hands undertake an interference for the removal of the embryo. An interruption may not only expose life and health to considerable danger, it may also impair the procreative capacity, and cause changes in the germinal layer of the ovaries which may have a serious, indeed destructive, effect on later pregnancies when they are wanted.

In almost every civilised country in the world there are now laws which provide for the special protection of pregnant and lying-in women. Almost everywhere the reinstatement of a woman worker before the lapse of six weeks after delivery is prohibited by law. In many big works and factories, nursing rooms are arranged for nursing mothers. Where there is not one of these, the nursing mother has the right to prolong her intervals for rest so that she may go home meanwhile to give her child the breast. Middle-class women are worst provided for everywhere. The woman who actually has the privilege of being only a housewife and mother, and does not need to share the responsibility of supporting the family, often has the least care and extremely little possibility of recovering from childbirth—partly because of the necessity for looking after the household herself again as quickly as possible, but mostly because of ignorance of the need of a good recovery in childbed. And this is so although it would often be technically and economically possible in such cases. Mothers,



relatives or friends would willingly help in the housekeeping if they were asked, or even if they knew something about the advisability of giving such help. Hence, it happens no doubt that women, in big towns particularly, become prematurely nervous and worn out, and are in consequence afraid of adding to their offspring. Enlightenment regarding the necessity for satisfactory recovery, as well as the organisation of those who are able and willing to help for those always very numerous cases with no relatives at their disposal, such as has already taken place in Holland, for example, would give very effective help here.

Those who have to go out to work again, particularly, are in duty bound to recover thoroughly beforehand, for the double burden of housekeeping, maternity and profession even when, as in the academic professions, it is possible to be relieved of the actual housework, is a great strain on the mental and physical efficiency and elasticity of women. This is true to an even greater degree for the factory-hand, if when she comes home tired from the factory she has to do all her housework, to cook, sweep, clean and, finally, to preserve her capacity for keeping an open heart and receptive mind for the needs and problems of her husband and children. Therefore, in the case of professional women, and particularly factory-workers, rather long intervals between pregnancies are advisable. However, the other solution of this problem, the wife's return wholly to the family, and the husband earning enough to keep the whole family independent of his wife, is, in my opinion, far more worth striving for.

To lay down theories as to how long a woman should nurse her child herself is as a rule unnecessary nowadays. Very few women who have the desire and will to nurse their babies have sufficient food at their disposal long. Often after a few weeks the inadequate maternal nourishment has to be supplemented by a bottle, much to the sorrow of these mothers, for it is a simpler and less troublesome—also cheaper—matter to bring up children when the child gets its food exclusively from the mother. In many



circumstances, it is good if a child born in spring can be nursed through the hot part of the year. In any case, an effort must be made to give the mother's milk for the first three months; this is enough in most cases. However, breast feeding should not last longer than nine months. In Oriental and southern countries, it is true, one sees children as old as six years and more taking the mother's breast unaided. In this case, as I know from my own experience, poverty is often the reason. "I have always milk, but I have not always bread" a southerner once said to me. In our urban population, however, such an extension of nursing is hardly ever possible. As a rule, nursing comes to an end of itself owing to the supply of milk getting less and less. In other cases, a fresh pregnancy, an illness, or the growth of the child, causes it to be given up. If the supply of milk does not fall off of itself, weaning is done in the course of six weeks by gradually substituting a bottle or pap at the feeds, whilst the mother helps the decline of the milk by food as scanty and dry as possible, and at the same time containing very little salt.

To restore the former firmness and elasticity of the breasts at the end of the nursing period, and to make them pretty and attractive again, special care is needed in many cases. In pregnancy, during childbed, and the whole of the nursing period as well as afterwards, a well-fitting bust support should be worn which holds up the breasts and prevents dragging. In addition, suitable exercise of the muscles with which the breasts are closely connected can do a great deal to restore firmness and elasticity to the organs. I have described in detail exercises of this kind on p. 140 of my book, "Sex Efficiency through Exercise," which has already been mentioned several times. They are best done under the direction of an instructress. Sport in which the muscles of the arms are used, swimming, rowing, tennis, golf, likewise contribute to their restoration; but the breasts should be firmly supported while engaged in these sports, so that they do not hang about and thus become relaxed.

Altogether, women should strive by means of sport and



gymnastics, in the intervals between pregnancies, to develop again to an increased power of resistance and functional capacity. They should endeavour to check vigorously the sluggishness and physical laziness which sometimes exists; they should make an effort to feel young and to look young.

Women have to do the work of restoration not only in the physical domain, although by suitable training of the body in the way indicated above, the mind is given new freshness and efficiency; for, in making the body healthy, the mind is necessarily made healthy also. The woman reader will perhaps ask in astonishment: can and must there be any question of restoring the health of the mind? In a certain sense: Yes! Pregnancy, confinement and childbed make a woman put herself and the coming child to a certain extent in the forefront of every happening, so that family life and, in particular, conjugal life suffer from this. True conjugal harmony and real family life can only exist when each has consideration for the other, and on both sides the non-essential gives way to the important—when all the sacrifices and consideration do not come from one side only, but mutual understanding and giving way to each other keep any idea of sacrifice from coming up; for the little acts of consideration for each other, the discomforts we undergo for love of each other, need not be labelled with this big word! But now for nearly a year more and more consideration has had to be given almost exclusively to the wife, or, if you like, to the expected child; and the husband—however willingly and pleasantly he has shown consideration for the coming child—does feel to some extent neglected. He now has quite decidedly a certain claim to be restored to the first place, and to make demands on his wife's time and strength on his own account.

Here the wife has a great and important decision before her, which she, although much is decided for her from the start by nature and predisposition, has to make by herself with intelligence and judgment and, above all, with love. Among fine women—the other kinds, of whom there are a



few, I am leaving out of consideration for a moment—I have met first and foremost three types. The first type is mother only ; the second wife only ; and the third is able to combine the qualities of mother and wife in such a way that both sides get their due. I think there can be no doubt that the third type is the one we must consider best worth having. For the woman who can be a good mother to her children, and, at the same time, maintain and develop more and more the mental, spiritual and erotic relationship with her husband, is ever young, since she is generally able to continue to develop mentally and keep an open mind and heart for the troubles of others.

In my opinion, a woman should aim at this ideal as soon as she has discharged the tasks directly imposed on her by conception. To be sure, it is natural to want to put the child, which has engrossed mind and body for months, at the centre of life, to make it the focus of interest, to devote one's whole strength and mind to it, to regard all its movements and every development with loving eyes, and to think that it is best looked after if it learns everything through its mother, if no strange, less loving, hand touches it, if every trouble and every upset is kept away from it from the beginning. However, I cannot help stating, without wanting to invade the realm of the training of children, that these very children who are hedged about with care and attention, whose mothers exist only for them, are often particularly difficult people in after life, a burden to themselves and others just because there is no longer a watchful mother's hand to clear everything out of their way. That this danger is particularly great for only children must be specially emphasised. In a crowd of brothers and sisters children grow up together, and rub each other's corners off. But the only child has to have its corners rubbed off too. It has to learn that other people in the family have to be considered besides itself, that it cannot always have its mother for itself, but that it is right and necessary that she too sometimes has "no time" for the child. Thus it is best for it to learn to find its way about in life.



There may be evil consequences for the mother, too, if she is occupied solely and only with her child or children. The period in which the child "belongs" to her is comparatively brief. School soon cuts into her exclusiveness; the child's interests go their own way, and a way which does not always conform to the principles of the mother's training; the first estrangement comes—an estrangement which the mother feels very bitterly, for she has given all her attention to her children, and she is cut to the heart when they want to go their own way and like things in which she cannot share or people she does not care for. This estrangement becomes still more marked later, when the child is grown up and takes its own way all the more. How often do we hear it said: "How indifferent a son or daughter is to their mother and yet the mother has existed always and only for her children." Alas, for the woman who has not been able to devote herself to her husband as well as to her children, and have interests which outlast youth; her old age may be lonely and friendless, for the coddled and pampered child is the very one to try its utmost to be mentally independent.

And the woman who abandons her children to the care of strangers after they are born and devotes herself exclusively to her husband again? She, too, only partially fulfils her purpose in life. In this case, too, there is estrangement between her and her children which brings punishment in later life. For a woman does not live only for the short time which her children spend in their parents' house, she should be able to enjoy the independence of her children and the life they make for themselves. The bitterest part in such cases, however, is finding that not only the children feel that something in their mother's conduct is not right, but also that her husband feels it too—for even the most loving and devoted man in married life is not only a husband—he is a father as well. And though he himself is not neglected, he will feel the neglect of his children to be an injustice, and the marriage as such will be affected by this one-sidedness.

I think I have shown that it is good for all concerned, husband, wife and children, if the wife is able so to divide



her two-fold duties that husband and children get justice, and, what is much more important, love. It is true the woman who can rely on her instincts will never have any doubt when she must give her greatest attention to her child and when to her husband ; but there will always come moments when doubt creeps in as to whether the way she has taken is the right one. A wife's conduct has to be like that of a good doctor, whose dearest patient is always the one who needs him most. Nevertheless, she has to follow not only her heart, but also her intelligence in this. Her heart may tell her it would be much better to look after her child herself, but her intelligence will tell her that her nurse does it just as well, and it is much more important for her to lie down for half an hour in order to be fresh and mentally receptive when her husband comes home in the evening. She will know, too, when she can tell her husband the latest deeds and powers of her baby, and when he is too full of business cares to be bothered with these things. The ideal wife a man wants, and which any of my readers might be, knows how to share herself so that no one of the parties which may be in opposition to each other ever notices that she herself is sometimes torn between them.

The continuation of a woman's mental development, as has already been said, is important for the marriage as well as for the training of the children, who very quickly outgrow their baby shoes and become mentally independent beings. We so often come across wives who have remained at the mental level at which they were before their marriage, whilst the husband has gone on developing and is perhaps one of the intellectually great people of his country. The chief reason for this is, no doubt, to be found in the fact that many of the very men who are distinguished in intellect have a certain horror of very highly educated women, and want their wives to be mentally inferior to themselves. Then these men are the very ones to suffer if their wives are only interested in externals. Therefore, my advice to all women who are married to clever men is to go on educating themselves, and to find a field in which they can take a serious interest.



After this digression into the general—which, however, I consider to be most closely connected with our subject—let us return to our theme of recovery after pregnancy and childbed, and set forth the following conclusion : a woman after the birth of a child has both the task of caring for and restoring her body for the further fulfilment of her maternal and conjugal duties as well as the equally important duty of working to build up and maintain mental congeniality with her husband and children.

And, lastly, she has further duties to herself. She should so live her life so that she may never find herself faced with emptiness, but that, even if an inexorable fate were to make her alone in the world, she should be capable of imparting the riches of her mind to others. A true woman, a true mother, will never be left aimless and without perception ; she will always be capable of placing her motherly, her womanly, qualities at the service of the world in general—of devoting them to those who need them most.

The nature and life of a wife are characterised by three Latin words—three concepts which make one :

*Amor—Hymen—Caritas.*

Love for her husband—marriage—love for her children and, in the wider sense, for her fellow-men.

All the tasks contained in these concepts a wife should accomplish, and all of them she *can* accomplish. For all this is comprised in one all-embracing whole—the highest a wife is—the highest of which she is capable—the highest she does—in one word : love.



## CONCLUSION

SHALL I summarise the contents of this book? I am afraid I cannot, for they are not adapted for this.

Let us rather grasp their *meaning*.

A greater man has outlined it.

"I have a question for thee alone, my brother: I cast it as a plummet into thy soul that I may know how deep it be.

"Thou art young and desirest child and marriage. But I ask thee: Art thou a man that *may* desire a child?

"Art thou victor, self-subduer, master of thy senses, lord of thy virtues? Thus do I ask thee.

"Or speak the beast and blind need in thy desire? Or loneliness? Or self-discord?

"I would that thy victory and freedom desired a child. So thou shouldst build living monuments to thy victory and thy liberation.

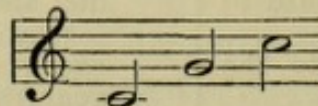
"Thou shalt build beyond thyself. But first I would have thee be built thyself—perfect in body and soul.

"Thou shalt propagate thyself not only *onwards*, but *upwards*! Thereto may the garden of marriage assist thee?

"Thou shalt create a higher body, a primal motion, a self-rolling wheel—thou shalt create a creator.

"Marriage: this call I the will of two to create that one which is more than they that created him. Marriage call I reverence of the one for the other as for them that possess such a will."

Thus spake Zarathustra—"Of Child and Marriage."





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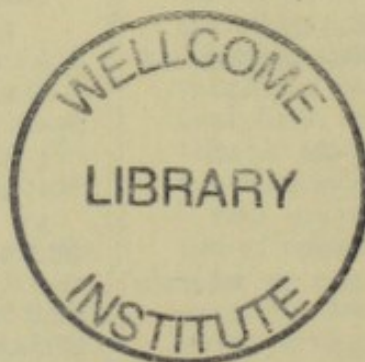
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