

DIETETIC TREATMENT IN PREGNANCY.*

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During the last twenty years medicine has kept pace with the discoveries in natural sciences, especially those in physics, physiology and physiological chemistry. Physical and dietetic measures have assumed a prominent place in therapeutics, not however without opposition from old physicians as well as from the narrow-minded younger generation.

Like other specialties, gynecology, while developing a method of procedure in local treatment, at the same time has recognized the value of dietetic treatment. No less an authority than F. von Winkel⁴ has undertaken to write the chapter on "Diet in Diseases of Women" in Von Leyden's book.³ In this volume, which contains everything of practical utility known to date, dietetics of pregnancy is gone into more fully than has been customary in text-books. Still a great deal remains to be determined scientifically and to be applied in practice, especially since women are assuming a higher position in the social scale in all civilized countries.

Pregnancy is certainly a normal physiological state; still at all times, even among people of the lowest civilization, the pregnant woman is treated with particular gentleness and care with the avowed object of averting harm from her and her unborn child and to enable her to give birth to a vigorous offspring for the sake of society. To this end folklore and superstition have depended on various nostrums and dietetic measures,^{1,2} while scientific and practical medicine has confined itself more to hygienic measures and the avoidance of a mode of life apt to prove injurious. Investigation has established the fact that among human³ beings and domestic animals⁵ the healthy pregnant individual requires increase in food in the form of albumin, fat or carbohydrates. The increment required for the fetus is balanced by the increase in metabolism and diminution in the work required of the female. But the importance of lessening the work of a pregnant individual is recognized to a greater extent in domestic animals than in human beings of the working classes or even of the better classes.

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In some civilized countries¹⁹ the laws forbid the woman to work for a period of four or six weeks after confinement and also provide for sick benefits during that period. But the need on the part of the mother of dispensing with work during the last part of pregnancy is not recognized. With the beginning of the twentieth century the first attempt, unsuccessful²⁰ as yet, to pass laws for the protection of the mother from labor during the latter part of pregnancy was made in France by Senator M. Strauss at the instigation of Pinard and others. In Switzerland laws were passed in 1877 (Constitution, Art. 15) forbidding factory women to work during the last two weeks of pregnancy and providing for sick benefits during that time. Since the enactment of these laws, according to the reports of the factory inspectors, the average weight of newly born infants has increased 300 gm., premature labor has diminished and the number of births in proportion to population has also increased. In the factories of J. Dollfus (Mühlhausen in Prussia) the mortality of infants under one year fell from 39 to 25 per cent when the mothers were excused (with pay) from work six weeks before and six weeks after labor; in the Canton Glarus the mortality diminished notably when six weeks of idleness, after confinement only, was enforced.²¹

The demands on the mother made by the fetus for special elements requisite for its growth, such as iron and lime, are supplied by her adaptation to a certain diet. In this the breeders of animals have made more progress, as they recognize the need of special feeding to prevent anemia and osteomalacia. The pregnant woman has longings for special food, such as fruits and sour things, or will eat lime from the walls. Neither scientifically nor practically has anything been determined accurately on this point. In this, too, folklore has played an important part but has proved to be of little value.

The investigation of metabolism during pregnancy has not been carried out scientifically and in deciding the question of proper feeding we are forced to be guided by the results of inquiries as to metabolism in adults generally;² later we may be forced to reject conclusions arrived at theoretically. The special interest of the obstetrician in dietetics of pregnancy depends on:

I. Is there any connection between the state of health and strength of the mother and the character of the birth, the puerperium and lactation? If there is, can we influence that interdependence by feeding during pregnancy?

II. Is there any connection between the feeding of the mother and

the development of the child? If there is, can that fact be employed as a therapeutic measure by the obstetrician?

Both questions are to be answered separately. To answer even the first question involves many difficulties.

The uterus on account of its peculiar innervation performs its functions even under difficult circumstances, such as in severe acute diseases, in the paralytic, in those with atrophy of the muscles and in consumptives. The only difference is in how that function is performed. Many, though not all obstetricians recognize the so-called primary uterine inertia of the chlorotic and poorly developed woman (Virchow, W. A. Freund).¹⁷ The same holds true as regards the so-called secondary feebleness of labor pains due to diminished action of the abdominal muscles met with in the anemic, convalescents, in women reduced by an organic disease such as nephritis and in women with extreme relaxation of the abdominal muscles. Our observations on the latter group of secondary feebleness of labor pains are supported scientifically by the investigation of labor pains by Schatz,¹⁸ Ahlfeld¹⁹ and Westermarck.²⁰ On the other hand we have no certain knowledge regarding the pathological condition of the uterine muscular structure or of the elasticity of the connective tissue as a factor in the progress of labor in the first group of primary uterine inertia. We hope that this gap in our knowledge will be closed by the rapidly improving histological technic.

The position that very fat women occupy is subject to controversy. In literature of antiquity up to the time of the Arabs, difficult labor was ascribed to obesity and many remedies²¹ and postural treatments were advised. In modern times, however, this belief has been abandoned. P. Müller²² says of this subject: "Obesity does not cause any disturbance of pregnancy or of labor." I do not coincide with this view and believe many obstetricians are of my opinion. Experience gained from gynecological operations proves that the majority of fat women have thin atrophic abdominal muscles, which is the cause of the frequent secondary weakness of labor pains during the second stage. At the same time there must be changes in the uterine muscular tissue of which we know nothing as yet, because atony of the uterus with post-partum hemorrhages is very frequent among fat women. Above all, I have seen the much dreaded primary uterine inertia of elderly primiparæ, with labor lasting from three to five days, without exception among fat women only. In thin and spare elderly primiparæ the soft parts of the outlet caused the only difficulty in labor. I therefore include fat women in the group of the anemic, chlorotic and those

with atrophied abdominal muscles. All these types of women encounter some difficulty during the puerperium, all have to combat some form of impaired function of intestine or bladder. They furnish the greatest number of those with subinvolution of the uterus and its evil train.

Of greater importance still is the fact that the number of women who cannot nurse their young is ever increasing. The mother's inability to nurse her offspring is not only of importance to that infant or that family on account of the greater mortality²⁸ and liability to rhachitis among artificially fed children, but is of still greater importance from a sociological standpoint. The researches of Ph. Biedert²⁴ show that artificial feeding of infants was almost unknown before the fifteenth century. The inability on the part of mothers to nurse their children cannot date back to an early period; furthermore the observations of many obstetricians that inability to nurse children is handed down from mother to daughter has been established as an incontrovertible fact by Von Bunge.²⁶ He has proved that inability to nurse once acquired is hereditary in the highest degree and is permanent; it is a stigma of degeneration. Without going more deeply into the investigation of the causative factors of inability to nurse, basing on the researches of Biedert and Von Bunge, we can confirm that during the lifetime of one generation of obstetricians the number of mothers who cannot nurse is ever growing larger and is mostly increased by the chlorotic, anemic obese and by women exhausted by overwork. In no generation can it be better recognized than in our own. Woman's sphere of labor both mentally and physically is broadening rapidly; a great many women have not been able to adapt themselves to their calling and in consequence suffer from some ailment which of itself does not cause invalidism but proves a great drawback when they are called upon to perform their sexual duties. Not only factory girls but teachers also, office workers and shop girls form a large proportion of the anemic exhausted women, who are eager to nurse their children but cannot. There is no intention to contract woman's sphere of usefulness but simply to point out the drawbacks which are to be remedied.

Among the wealthy classes, on the other hand, the manner of life of some leads to an early accumulation of fat, while others become severely anemic through partial abstention from food, which has become the vogue during the last five or six years in order to gratify a vanity to appear thin and graceful. So long as these women exercise in moderation they are better off than the women who become very fat; when, however, they exercise to excess they together with the

fat women add to the number of those who cannot nurse their children even if they change their mode of life later. In fact during the last ten years the number of women who cannot nurse has increased to an alarming extent. Even the statement of Hegar,²⁷ whose clinical material was drawn mostly from the peasant population, that 54 per cent. of the mothers could nurse their children for ten days is not very encouraging. At other clinics for the 10 or 14 days during which the patients were kept at the institution the figures vary between 25 and 65 per cent. We will not question whether these women could continue to nurse, but are content with the fact that they could nurse at the beginning of the puerperium. It is evident that aside from unwillingness to nurse, on account of folly or vanity or stress of domestic duties, 40 to 75 per cent. of inmates of institutions, young mothers mostly, were physically able to do so. We do not possess accurate statistics from large cities and industrial centers; still I am of the same opinion with Herdegen²⁸ and Von Bunge, that for such centers less than 45 to 50 per cent. of mothers are in a physical condition to nurse, and that the percentage of those mothers who can continue to nurse without artificial aid is below 30, the percentage given by Hegar for Freiburg. In the lowlands the conditions are more favorable, although I have heard country practitioners state that the ability to nurse among the women of their districts is diminishing. For Würtemberg, Hegar estimates the number of those who can nurse at from 20 to 25 per cent.

The inability to nurse has been proved to be hereditary and in that fact lurks a great danger to the nation. The oftener the milk of animals is examined the more do we recognize how nature purposely adapts it to the wants and growth of feeding animals and learn that never can we successfully supply artificially the products of the mammary glands. It is therefore the duty of the physician, who cannot oppose justly the broadening of woman's fields of usefulness, to recognize and treat any weakness of her constitution, especially during pregnancy. With treatment the physician not only can improve the chances of labor and insure a vigorous child, but he also can combat the threatened inability to nurse, eliminating thereby a widely acting degeneration.

Can we report any success in treatment in this field worthy of mention? My answer, based on a small number of cases in my private obstetric practice, is Yes. These observations extend over a period long enough and have been studied with care sufficient to stimulate other physicians, especially chiefs of clinics, to an investigation of the

subject. More is not to be expected of these observations. To insure an easy birth and to diminish the pain some authors, as Ramsbotham,¹² Holbrook,¹³ Lohmann¹⁴ and Eichholz,²⁰ have suggested certain dietetic measures with or without regard to the constitution of the pregnant woman; these various dietetic measures consist of a more or less vegetable diet with fruits and fruit juices. The idea is certainly as justifiable as the employment of narcotics, chloroform or ether to ease the pains of labor. The proper execution of this plan depends of course on the intelligence of the patients and until now it has not been sufficiently investigated. Without doubt these authors are in the right, guided by the scientific investigators who oppose a "full meal," because healthy pregnant women do not require an increase in their food. The easier and less painful confinement of women in tropical and subtropical regions and in the southern countries of Europe, where the women subsist chiefly on a vegetable and fruit diet, speaks well for the efficacy of a vegetable diet and the exclusion of meats and foods containing lime. We need not depend on the doubtful reports of travelers about confinements among the uncivilized and among those of a low state of civilization; at the same time the pelvis in these lower races is not more favorably formed, in fact is less so, than in women of northern parts of Europe. This statement I can support after a thorough study extending over many years of the pelves of different races. But even European women, especially English women, maintain positively that their confinements were easier and less painful in India, South America or southern China while leading the life customary in those countries than their previous or later confinements in their own country with the habitual manner of living.

Lohmann's statements in regard to the "cherubs" weak, chlorotic and poor-blooded women are supposed to give birth to, are not borne out by the experience of any large obstetric practice. His other statement, that "lank anemic" women bear fat children is also refuted by the experience of any country practice. Nevertheless his suggestions regarding the feeding of pregnant women are worthy of attention and should be investigated more fully. The adoption of hygienic dwellings and manner of life proceeds slowly but surely among the masses, while the inability of the mother to nurse has become an important factor. It is therefore of the greatest importance to determine by scientific investigation a method of feeding pregnant women which, without injuring the child, will result in easier confinements among women of our civilization and enable them to nurse their young. Among the foods to be employed are those deficient in nitrogen as well

as vegetables and fruits. At the same time hygienic measures should not be neglected—such as exercise, a minimum of work, airy sleeping apartments, conditions which exist in modern hospitals and our institutions, but not in the homes of pregnant women generally. In the course of years I have become convinced that healthy women will suffer less from constipation during pregnancy provided they partake of but little of meat, fluids, or bread, but a great deal of vegetables and fruits.

Private practice, however, does not furnish sufficient basis to determine accurately the question regarding the weight of the child or how to make confinements easier. The sources of error are too many. According to the statements of patients and midwives who were associated with me in several confinements of the same patients, the dietetic measures suggested were followed by good results. The therapeutic measures to be discussed in this article were employed primarily for pregnant women reduced in general health. With a view to improving their constitution and to insure an easy confinement and normal puerperium, I prescribed a form of diet adapted to their social status, guided by well-known scientific researches. A great many observations have been made since 1885, which marks the beginning of my interest in the subject, but of the many observations I can point as proof of the value of my method of treatment only to women who on previous occasions had gone through difficult confinements under my care or that of reliable physicians. With these restrictions my observations number four or five cases of extreme obesity treated with a restricted diet and seven women extremely reduced in their health treated with overfeeding. All these women had normal pelves and had passed through one (the majority more than one) confinement which had been very difficult on account of their condition.*

The manner of life prescribed for fat women was not arranged according to an unalterable plan but was modified according to individual circumstances. All patients were forced to abstain altogether from soups, alcoholics and all forms of sweets, including preserved fruits. At the same time a definite amount of exercise carried out several times during the day was ordered, including general massage except of the abdomen, gymnastic and hydrotherapeutic measures. The quantity of carbohydrates and water inclusive of tea and coffee was strictly prescribed. Of bread 120-150 gm. and of fluids 500-600

*The following holds good not only for the cases mentioned, but also for all pregnant women for whom it is advisable to prescribe a certain diet on account of obesity.

c.cm. was rarely exceeded. On the other hand the choice between meats, fish, vegetables and fats* was left to the discretion and taste of the patients. Above all raw fruits were permitted to quench the thirst but not in too great a quantity at one time.† Fruits agreed with preparations of iron, which were always given over an extended period. The most suitable preparation proved to be *ferrum rub.* with a little Rhei pulv. Laxative drugs were permitted only when absolutely necessary. All orders were given with absolute minuteness in writing, preferably dictated to the patients. The patients after ascertaining their weight called every three or four weeks to receive instructions as to minor changes in diet as well as for urinary analysis, which is essential. Treatment began as early in pregnancy as possible and was modified according to weight and condition of the patient, without, however, going to extremes. It is important to be strict with patients during the first six or eight weeks; after that time with resulting improved state of health patients have no desire for a change. A few delicacies after the restricted diet are permissible.

The conclusions to be drawn from the foregoing are as follows: All the patients were of average height, extremely fat and possessed a poorly developed unused muscular system. Two among the number had pendulous abdomens. All had passed through one or two difficult confinements, characterized by primary uterine inertia, by long duration of labor, by deficient action of the abdominal muscles and by atony of the uterus after labor. One patient began treatment some time previous to her pregnancy, while three patients commenced treatment at the beginning of pregnancy. The treatment, aiming to obtain diminution of fat but not restriction of food, began in a slow and deliberate manner, culminating in two or three weeks in a strict diet and manner of living. The patients lost a few pounds at first notwithstanding the advancing pregnancy; later there was a slight increase in

*Greasy sauces and sausages were not permitted. Vegetables were prepared according to the English style by the addition of butter instead of suet.

†Typical diet: 7 A. M., 125 c.cm. coffee with milk, 40 gm. bread and butter, 1-2 eggs, a little fruit; walking 40-45 minutes before or after meals. 10 A. M., massage or gymnastic exercises. 10.30 A. M., a little fruit, one egg, 15 gm. rye bread with butter. Dinner: Roast or boiled meats, fish, vegetables (beets and peas excepted), salads, fruit and cheese; 125 gm. water or a little wine added to the water at the end of the meal; no sleep after the meal. 4 P. M., one small cup of tea or coffee not exceeding 100 gm., 15 gm. rye bread and butter, 1 egg if desired; a walk of 1-1½ hours' duration. 7.30 P. M., eggs or cold meats, 125-200 gm. tea or milk, 40-60 gm. bread and butter, fruits or salads. Drugs such as thyroid ext., suggested by R. v. Braun (*Centralblatt für Gynäk.*, 1896), in contracted pelvis were purposely omitted.

weight, though still disproportionate. They all maintained that they did not feel so much relaxed as previously, were sprightlier, suffered less from thirst, walked and worked more easily. The course and character of the confinements were in every case more favorable than in earlier ones. Still we must not be too sanguine in conclusions, as all confinements are not alike and later confinements are apt to be easier than previous ones. It is worthy of note that two of the patients had each gone through two difficult confinements, but after subjecting themselves to treatment had passed through a third which was a great deal easier. Still more impressive is the case of another patient. She had grown very fat before her third confinement, having been dissuaded from undergoing treatment, and had as much difficulty as in her first. During her second and fourth confinements she was under treatment and in consequence had easy births. The improved action of the abdominal muscles during the expulsive periods could be demonstrated in a very characteristic manner. In all cases, too, the spontaneous normal expulsion of the placenta was typical. There was no atony of the uterus and less blood was lost than formerly.

Regarding the ability to nurse, there was no improvement in those mothers who had been unable to nurse after previous confinements. Those mothers, however, who nursed after previous confinements were so much improved by treatment that they were able to nurse longer, more easily and more thoroughly.

In the dietetic measures employed the growth of the child as regards length and weight were not considered.* The diminution of carbohydrates and water was not specially marked, but the weight of the child was distinctly decreased with the loss of fat by the mothers, who were otherwise healthy, notwithstanding the fact that the children ought to have been heavier on account of the age of the mothers and the later births. The marked increase in weight of a third child whose mother was not treated during the pregnancy must certainly be regarded in the light of a typical experiment. The length of the children and the consistence of the bones of the skull were apparently not influenced; on the other hand the scalp could be moved very easily over the skull and the skin of the face and back appeared distinctly less puffed in many.

Women reduced in their general health by congenital chlorosis, any general disease or by too many confinements in rapid succession cer-

*G. Klein of Munich (*Monatschr. f. Geb. u. Gyn.*, Vol. 8, p. 716) has tried with success a similar diet in a woman with a normal pelvis to obtain a smaller child and thus obviate the danger of a heavy child in prolonged pregnancy.

tainly stand in greater need of dietetic treatment during pregnancy than fat women. Unfortunately a distinctive method of feeding cannot be suggested to the practitioner, because the reflex irritability of the stomach of pregnant women has to be taken into account. But certain points serve as a guide. Treatment should begin early in pregnancy. Complete bodily rest* extending over several weeks is advisable. If possible the patient should be removed from her family and surroundings. We should not insist on certain kinds of food only, as for instance milk, meats and eggs. Adapt the food to the appetite and digestive powers of the patient. Of course it is desirable to give as much albumin and fats as possible. Pregnant women can take a large quantity of cream. Above all, change the manner of preparing the foods as frequently as possible.† Patients thrive better with greater variety in the diet. Dry rubbing and light massage for skin and muscles are begun even during the preliminary period of rest; later these are continued or are replaced by light exercises. Contrary to the rule for fat women, all kinds of fluids are given generously to the end of pregnancy.

The quantity of alcoholics is limited to the minimum required for the stimulation of the appetite. This generous, though not excessive feeding, avoiding an excess of caloric units, must be continued by small and frequent meals to the end of pregnancy. In the period of rest reduced women can take large quantities of food, as their capacity and appetite have soon discovered. My impression has been though that for all patients the first five or six weeks are the most important; during this time they regain their strength very quickly and the increase in weight is most marked, while later the pregnancy assumes a normal course as in healthy women with a slower increase in weight. There is no occasion then to overfeed the patients in case their appetite fails. I have been able to cure women even in the last eight weeks of their

*In hospitals, institutions and in the country the patients should rest as much as possible out doors, according to the location of the house and season of the year.

†Typical diet during resting time: Early in the morning a small plate of oatmeal gruel with milk; dry rub with a rough cloth. 8 A. M., $\frac{1}{2}$ cup of coffee with $\frac{1}{3}$ - $\frac{2}{3}$ cream, a liberal supply of wheat bread, 1 egg and plenty of butter. 10 A. M., milk or cream with cocoa or chocolate, bread and butter and 1 egg. 1 P. M., a rich meat soup with flour balls, or a soup made of fruits with cornstarch, meats, fish, a generous supply of vegetables with much fat, mashed potatoes prepared with milk and butter, cooked fruits, pastries and salads. 4 P. M., the same as at 10 A. M. 7 P. M., light egg foods, pastry, oatmeal or milk soups, wheat bread and butter, salads and warmed-up vegetables if desired. In addition the patient is to drink as much milk and cream during the day as she can digest.

pregnancy; it is preferably to begin earlier however. Constipation may prove very troublesome; laxatives should not be given as a rule, but when absolutely necessary a vegetable laxative may be administered. Fruits, salads and in northern countries bread made of wheat and rye, Graham bread and above all regular habits will lead to good results. Occasionally small injections of salt water or oil and water can be employed with a good result. All my patients received small doses of iron for a continued length of time even with fruits and salads. All preparations and combinations agreed with the patients, though occasionally it was found necessary to select a particular preparation. The patients were subjects of various diseases. The majority had been invalidated by severe hemorrhages. In nearly all in addition to the anemia there was extreme atrophy of the abdominal walls and abdominal muscles, to which special attention was given. I maintain that up to the beginning of the seventh month of pregnancy massage of the abdominal walls can be carried out with good results in multiparæ by a skilled masseuse without starting labor pains. Special exercises of the abdominal muscles are also well tolerated up to the eighth month. The influence of the dietetic treatment on the blood, bodily weight and the character of the confinement is so pronounced that it becomes superfluous to say more, and skeptics who would ascribe the good results to chance or to the fact that all my pregnancies and births did not run a similar course cannot be convinced until they have subjected suitable patients to the treatment and noted their rapid improvement and their easier confinements. The improved action of the abdominal muscles and especially the increased uterine contraction during the third stage of labor are puzzling to the physician who has had to spend exhausting and anxious hours with the same patients at previous confinements. The treatment must also be credited with improvement in the ability to nurse.

In the treatment of the anemic as in that of fat women no attempt was made to influence the size, weight or constitution of the child. Still it is noticeable that the weights of the children were increased as a rule in most patients with each succeeding confinement and this increase considerably surpassed the usual average. (See papers of H. Gassner and P. Baumann). This increase is still more convincing in view of the previous diminution of weight during a time of depressed health. Of the women who became pregnant again at a later date while in normal health, two gave birth to slightly smaller children, while a third gave birth to a much smaller one. This is proof that increase in weight of the child can be ascribed to the overfeeding of the mothers.

No one can be more convinced than I that the number of patients treated is too small to allow definite conclusions, but it is evident that we can gradually achieve important results by keeping pace with physiological investigations in this field. Prophylaxis is certainly the surest weapon of the modern physician and these investigations belong to that field.

The prospect of restoring to mothers the ability to nurse their children is not very encouraging though. Even in the first ten years of my practice it became apparent to me that heredity plays an important part. Von Bunge's investigation of the subject has definitely elucidated the important bearing of heredity. Still I have observed that a few women, though they are exceedingly rare, could nurse their children while their mothers could not. Guided by this fact I have attempted to establish lactation in six women who were not able to nurse their children but were eager to do so and who at the same time possessed good nipples, well developed mammary glands and showed distinct signs of colostrum during their pregnancy. All of these had made futile attempts at lactation after previous confinements. The mothers of these patients had been unable to nurse and in two cases the grandmothers were unable to nurse. As the patients were in good condition I proceeded in the attempted cure in an empirical manner solely, by giving liberally of sugar-producing foods; that is, carbohydrates in addition to the usual amount of albumin and fat. Gentle massage of the breasts of 15-20 minutes' duration with short intermissions were carried out every second day by a skilled woman, beginning six weeks before the birth. It did not inaugurate labor pains. I achieved success twice. In one case however it was quite limited, as in six weeks it was necessary to add bottle feeding, while in eight weeks the mother could nurse her baby but three times in the twenty-four hours and in twelve weeks the milk disappeared altogether without any symptoms of anemia on the part of the mother. In the second patient lactation was carried on satisfactorily for six months. Both of these women were Jewesses. Several aunts of one could partly nurse their children. The grandmothers of both had nursed several children. In the other four the conditions were more unfavorable. The grandmothers of two were unable to nurse their children, one of these grandmothers losing the power to nurse her younger children only on account of excessive drinking. The aunts of the others were also unable to nurse. The less encouraging these experiences may prove to be, the more do they point out the physician's duty to preserve the power of lactation in mothers in the interests of coming generations. Future investigation of this subject may per-

haps give us the means to combat this degeneration, in some patients at least.

We now approach the answer to the second question—whether there is any connection between the dieting of the mother during pregnancy and the development of the child, and in case there is a distinct connection whether this fact can be made use of as a therapeutic measure from an obstetric standpoint. This interdependence between the mother's and the child's organism must be viewed from a quantitative as well as a qualitative standpoint. No matter how certain we may be of this interdependence it admits of no direct proof and in the state of our present knowledge we must rest content with probable evidence.

Logically considered it would be highly irrational on the part of Nature to make the child dependent under all circumstances on the quantity and quality of the food ingested by the mother for under such limitations the child would be subject to overfeeding or to any other evil influence, without any exception. But we frequently see the most surprising contrasts under pathological conditions of the mother. Thus we see lean and feeble children of fat women and on the other hand feeble mothers or mothers weakened by disease give birth to robust and well-developed children. But nature does not work without aim even under pathological conditions. We observe vigorous children after severe acute diseases, such as pneumonia or typhoid fever; at times even during chronic diseases such as osteomalacia. Still in women subject to nephritis, syphilis, tuberculosis or inebriety the children are invariably feeble. In some cases nature evidently finds in the mother's blood the reserve material for the production of a vigorous child, depending on future nourishment to make up the loss in the other. In other women, however, those suffering with organic changes, nature cannot accomplish the same result. Evidently these are not aimless vagaries on the part of nature; we simply are ignorant of her workings and must continue to study these variations so as to be able to interpret them.

Nothing would be further from the truth than the conclusion that there is no interdependence between the nourishment of the mother and the development of the child under normal conditions. Much and important evidence can be adduced in support of such a relation. It has been amply proved in the breeding of domestic animals and in human beings by the statistics of P. Baumann³³ and H. Gassner⁴⁰ that healthy, vigorous and large mothers usually give birth to offspring similarly constituted, while delicate and weak mothers have offspring resembling them in condition. Exceptions to this rule are not denied but a satisfactory explanation for them has not been furnished. At times these

exceptions may be ascribed to influences exerted by the male or to the feeding of the mother during pregnancy. The number of exceptions however is so small that in the average they do not vitiate the conclusions drawn from these observations. It is established finally that the offspring increase in size and weight with the number of the birth up to a certain age of the mother in normal health. Similarly it is established that fully grown primiparæ have more vigorous children than primiparæ under twenty.

The subject of natural and sexual selection can be treated but lightly, since for the human race few scientific data have been gathered. Still we can point to the rapid progress made in the thirty years since Darwin's³⁵ work appeared. According to Darwin it is "idle and utopian to hope" that before the laws of heredity have obtained a more general acceptance the sexes will abstain from marriage when "suffering from some mental or bodily deficiency." Since then many attempts have been made to spread the knowledge of the laws of heredity by scientists, physicians, statesmen and especially by poets, painters and sculptors. Much has been done in this direction and in consequence a knowledge of the importance of a careful choice of a life partner has become widely distributed among all classes of the people. This knowledge will bear good fruit in a few generations and may lead to such desirable achievements as have been accomplished by breeders of animals for some time. The experience of animal breeders points to the connection between the feeding of the animal and the development of its offspring. Animal breeding, carefully following the laws of heredity, has not only produced very valuable breeds of animals either fitted for hard work⁶ or of a gentler strain^{8, 9} as desired, but has also been able to influence and perpetuate certain valuable traits of a particular animal. Climate, character of soil and food have been shown to be influencing factors. Breeders dispose of some of their best breeding animals to foreign countries, certain of success in achieving the same results with other strains under similar conditions of soil and feeding. Furthermore, the changes in other breeding animals under different conditions of soil and feeding have been studied and utilized. Breeders have determined the importance of certain methods of feeding in pregnancy with the object of obtaining special strains or of averting disease. They have also shown the bad results of a one-sided breeding, as overfed pigs and sheep throw only dead litters. In human beings we find only one similar case in the literature, reported by Von Bunsen.³⁶ A woman growing fatter with each succeeding pregnancy gave birth to fat well-developed children who died immediately before the birth or soon after.

Getting rid of her fat in the sixth pregnancy she gave birth to a normal living child. I am in a position to report a similar case.*

Animal breeders cannot attempt to experiment with a view to influencing the size and weight of every individual animal at birth by the manner of feeding, the quantity of water or the addition of salt and so on. They are content to have the animal develop after birth in a direction aimed at. These experiments would be more difficult in animals than in human beings. Even if they proved successful, they would not be acknowledged properly on account of the difficulties of comparison. In human beings we can make better progress by observation and experiment. Women in bad health not considered, experience has demonstrated that patients subject to excessive vomiting during pregnancy generally, though exceptions abound, give birth to children who are chlorotic and anemic, delicate and small though fat, provided the mothers are not properly nourished. Though there was no intention to influence the development of the child, my own investigations prove that in healthy women there is distinct evidence of the influence of continued dietetic measures on the weight of the child. All these factors lead to the conclusion that in all probability there is a connection between the nourishment of the mother and the development of the child in healthy women. Greater certainty we are unable to assume at present.

As physicians we are justified in utilizing this connection for therapeutic purposes. In fact the idea of influencing the child through the mother is old and has been extensively carried out under different civilizations in various familiar forms, such as blood letting, cathartics, hydrotherapy and so on. Scientifically this idea came into vogue at the end of the nineteenth century with the introduction of artificial premature labor in England, consequent upon the observation that in small delicate women it led to easy confinements, but the mortality among the children was so great that a reaction set in within ten years of its inception. A. Hoffmann,⁸⁷ H. Florschütz⁸⁸ and J. Reijenga⁸⁹ have discussed the subject so thoroughly that I will not enter into details here. In the

*Mrs. B., wife of a dealer in books, small of stature and exceedingly fat (154 cm., 86 kgm.) aborted in four years four times in the third or fourth month of pregnancy. Syphilis and gonorrhœa excluded. Kidneys normal after numerous examinations. Complete rest with beginning of third and fourth pregnancies useless. Microscopically nothing abnormal in fetus or placenta. After fourth abortion vigorous treatment against obesity. Became pregnant in second month of treatment. Dieting continued with exercises and light work. Pregnancy continued resulting in a living child. The patient became thinner under continued treatment and gave birth to two more children.

first and second quarters of the last century, according to these authors, many physicians of note of all civilized lands, especially those of England and Germany, attempted to influence the development of the child by dieting the mother during pregnancy with a view to obviating the dangers of a contracted pelvis. The therapeutic measures employed were either dietetic (Bruninghausen, Osiander jr., Ackermann, Assalini) or they consisted in blood letting and the use of laxatives, (Kluge, Fothergill, J. Lucas, Montaux). In the controversies raging at that time about the treatment, some physicians while not condemning it would not employ it in women with delicate constitutions or with highly contracted pelves (Reisinger, Baudelocque, Scanzoni); other physicians opposed the treatment in its entirety without a trial. The physicians who put faith in the treatment achieved many successes with it and the measures employed were justified in the light of the knowledge of those times. With wider knowledge of the present we cannot justly condemn the supporters of that treatment; at the same time we cannot blame the opponents of the treatment, because it weakened the constitutions of the mothers. In the diet recommended at that time the quantity of meat, bread and leguminous foods was curtailed too much, while on the other hand too much of thin soups and fluids was allowed. Even then the softness and flexibility of the cranial bones were noted, although on account of the plentiful supply of fluids the children were not lean (Bruninghausen, Ackermann). After long-continued use of laxatives the children seemed to be retarded in their growth (Kluge).

When I began the study of this subject sixteen years ago I was ignorant of the historical data on the subject. A succession of sad experiences in my private practice with children born with artificial premature labor led me to take up the study of the subject. These children, though born living, all succumbed despite every preservative measure. The attempts made universally at that time to utilize in practice the discoveries in physiology* I transferred to my chosen field. In 1885 according to Wyder and Panienski the mortality of children in induced premature labor was between 45 and 50 per cent in well-ordered institutions, in addition to the mortality and morbidity of the mothers, which was considerable. Löhlein reduced the infant mortality to 42 per cent. It was certainly no better in private practice. For the first two years there are no accurate statistics of infant mortality. As a matter of fact even in private practice among the average or the better class of people the premature children succumbed very easily to trifling

*I name the works by Oertel, Kulz and Ebstein only.

disturbances of the digestive organs or to slight attacks of acute children's diseases. The physician considered it an unavoidable evil.

Controlled by all the tests devised by experts in physiology, the treatment in a purely dietetic manner only of obesity, gout, organic heart disease and diabetes has shown that some foods can be dispensed with to a large extent or replaced by certain other kinds of food without loss of strength or detriment to the body. It long has been proved by extensive experiments in weight and measure that in the last two months of pregnancy there is a great increase in the weight of the fetus and that there is a deposit of fat in the skin, which becomes tense and inelastic at the same time. The extensive deposit of lime in the bones of the skull takes place in the last two months also. The idea then arose of producing in the mother a sort of balance of nitrogenous foods allowed; that is, to nourish her in such a manner as to supply her needs without any remaining excess and in that way to reduce to a minimum the supply of fat and water for the fetus. It was known at one time as the abstention treatment, compared to the treatment customary in diabetes. Still it was not correctly named. As is usual under such circumstances the first attempts though based on good theoretical grounds were altogether empirical. The instructions carried out by other authors for similar purposes were put into practice. "Treatment by alimentation" or "dietetic treatment" though not euphonious is the more appropriate name.

First of all a plentiful supply of albumin in the form of meat and fish was given but the quantity of fats added was sufficient to prevent decomposition of albumin with the accompanying loss of strength. At the same time the quantity of fat allowed was too small to admit of an accumulation of fat. The quantity of carbohydrates was quite limited but not to such an extent as to cause loss of appetite for other foods, as special attention must be paid to the appetite of pregnant women. I have laid great stress on the large diminution of fluids. There is a dispute to this day whether water causes an increase in fat.* In practice it is considered advisable to withhold fluids; it appeared essential to me to do so as I intended to influence the child indirectly, and I cling to the practice to this day. In the food given, especially in the vegetables, there is a plentiful supply of water. When fats and carbohydrates are partaken of sparingly the thirst is very much lessened.

The following diet was prescribed in my first cases under treatment, as published in the *Centralblatt für Gynäkologie*, 1889, No. 33:

*Compare the interesting discussion of this question in the chapter written by A. Hoffmann in Leyden's book (Vol. I, pp. 520 ff.).

Breakfast, one small cup of coffee (150 c. cm.), 25 gm. zwieback or bread and a little butter.

Dinner, all kinds of meats, eggs, fish with a little sauce, green vegetables prepared with fat, salad and cheese.

Supper, the same as dinner with 40 to 50 gm. of bread and a plentiful supply of butter.

Forbidden: water, soups, potatoes, pastries, sugars and beer.

From 300 to 400 c. cm. of red wine or Moselle wine a day permitted.

In the course of years slight variations have been instituted in this schedule, depending upon individual peculiarities and habits but the main points have not been changed. Whenever possible alcoholics were excluded, because temporary increase of the appetite is counterbalanced by a disagreeable thirst. In their place water or milk in small quantities and especially raw fruits were given. In the afternoon a small cup of coffee or tea with 15 to 20 gm. of bread or one egg was also allowed. The entire quantity of fluids permitted was limited to 500 c. cm. a day exclusive of that forming part of the food. Such a diet, $\frac{130}{100}$ units of albumin, $\frac{80}{130}$ units of fat and 100 units of carbohydrates, corresponds to $\frac{1800}{2000}$ caloric units.

Change of diet, especially in the kinds of meat and vegetables given and in variety of preparation is of the greatest importance. It is desirable to begin treatment ten or twelve weeks before confinement, and gradually to attain the strict diet in ten or twelve days. Ernest Fränkel⁴⁶ begins treatment in the fourth or fifth month with successful results in "quite a number of cases." Out-door exercise, housework and sleep must be regulated according to circumstances. Weigh the patient as often as possible. Urinary analysis is also desirable from time to time. This treatment is advisable for women with a true conjugate of not less than 8 cm. I have insisted upon this measure of the conjugate. With a conjugate of less than 8 cm. induced premature labor is the correct procedure. A few supporters of this treatment have attempted by this means to obviate or curtail the need of Cæsarean section or symphysiotomy, but this is going to extremes. The treatment finds its application within certain limits. Many women however can be benefited by it for the number with a flat or a flat and rhachitic pelvis is considerable. For primiparæ with a conjugate of 8 cm. this treatment is not advised. Frequently the first confinement is very easy even with apparently serious pelvic deformities. To employ this treatment in a primipara with slight pelvic deformities would lead only to self-

deception and not redound to its credit.* It is less desirable to combine this treatment with induced premature labor, as practised by Eisenhardt,⁴³ Löhlein⁴⁵ and Ahlfeld,⁴⁴ because the aim of the treatment, to achieve full-term, vigorous children, is nullified by this procedure. These principles finding a broader field of application, it may be possible in exceptional cases with a conjugate of $7\frac{3}{4}$ to $7\frac{1}{2}$ cm. by the aid of this treatment to postpone the induction of premature labor nearer to the end of pregnancy, as was done in Löhlein's successful case.

Only such cases however are to be considered as successful tests of this treatment as have gone to full term under treatment after passing through at least one previous difficult confinement on account of a moderately contracted pelvis. From this point of view I have arranged my own cases and those gathered from literature. A whole series of cases is therefore excluded, namely: Von Brehm's case, case 2 of Swiecicki, case 4 of Haspels, case 2 of the first series and case 4 of the second series of Reijenga. Many cases of which I became aware in the course of years from personal letters of colleagues are also excluded because they were not published in the literature. To stand the test of a critical examination every case which is not a positive proof of the value of this treatment must be excluded.

My first three cases were certainly successful (*Centralblatt*, 1889, No. 33). For twelve years more I continued my investigations, conscious of the drawbacks and of the just objections to this treatment. At present I have at my disposal 17 of my own cases with 26 births. All these cases were gathered with a view to the prescribed limitations, though in a few I acted as consultant only. For comparison I have collected from the literature 31 more cases with 36 births coming under the same category, making a total of 48 cases with 62 births. Some of the cases might have been omitted because the authors had reduced the indications to a conjugate of $7\frac{3}{4}$, $7\frac{1}{2}$ and even $6\frac{1}{2}$ cm. (Case 3, Reijenga), or the measurement of the pelvis might be questioned (Case X, Poll). Still I have considered it right to include them. In a few of the cases the time spent in treatment is too short and might be criticised on that score. They were also included, since to exclude them would only enhance the value of the deductions. The histories of the mothers are often incomplete. In future reports it is desirable in the interest

*Twice I was compelled to institute treatment in primiparæ with flat pelvis and a conjugate of $8\frac{1}{4}$ - $8\frac{1}{2}$ cm., as colleagues advised it I induced premature labor. Otherwise I would have been held responsible for a possible difficult confinement. Both confinements were easy. I cannot, however, ascribe the easy births to the efficacy of the treatment.

of medicine to publish the social status of the mothers, their height and weight. In measuring the pelvis more exact detail is indicated. In the reports of the previous births the sex, length and weight of the child should be given. As a general rule the mother had passed through quite difficult confinements, and in a series of observations had given birth to one or more dead children.

The dietetic treatment was preceded eleven times by induced premature labor, performed once or twice in the same patients, with bad results for the children. All mothers stood the treatment well and after a few preliminary difficulties bore it cheerfully. Thirst was one of the difficulties, especially in fat patients, and at times a repugnance to an excessive meat diet was another of the difficulties. Green vegetables can be given instead without harm even if the number of caloric units is diminished thereby. When the weight of the patient is known, this weight becomes abruptly stationary, at times after a preliminary loss, or there is only a slight increase in weight hardly accounted for by the increase in weight of the child. This fact of course points to the intimate relation between theoretical inferences and the practical results obtained.

Later confinements were easier than the preceding ones. This holds true even for those cases in which the influence on the development of the child was small or in which the patients stood in need of instrumental aid. The data of a whole series of cases are so minutely given and are so surprising that they must pass muster under the severest criticism.

All children were living at their birth, while a large number of the same mothers had given birth previously to one or more dead children. Those children born with slight asphyxia were easily resuscitated. A few lesions due to instrumental interference cannot be charged to the treatment. All children are living at least at the time of publication of these cases, their ages of course differing with their respective births. In all children, whether nursed by the mother or bottle-fed, a normal increase in weight during the first weeks and months is distinctly indicated. It is also frequently noticeable that the treatment has had no effect on lactation in mothers in whom some influence other than pregnancy might have been expected. Soon after the birth food rich in carbohydrates was given, of course. A large number of infants are described as distinctly lean, at times surprisingly so. All reports agree that the scalp is wrinkled, relaxed and deficient in fat, and that it can be easily pushed over the skull. They agree, too, on the ease with

which the bones of the cranium can be made to overlap. This fact is of great importance. The few reports of the softness of the cranial bones and wide separation of the sutures I regard skeptically. It is not probable that with a diet rich in albumin there would be a diminution in the deposit of lime salts, above all in the bones of the skull.

When we have learned to have less fear for the term "diminished feeding" in case the quantity of albumin is ever diminished over a protracted period, we can give more of fresh vegetables and less of meat. In this way we might achieve diminution in the deposit of lime salts. I see in it, however, no special benefit. Usually the bones of the skull appeared to me to be of normal resistance. The most important consideration lies in the fact that the scalp is deficient in water and fat and is wrinkled, which permits a greater overlapping of the cranial bones. On that account in a contracted pelvic canal the fetal head can mould easier and more freely. In addition all children were of normal length and exhibited the signs of maturity, and though their ultimate future is not mentioned they are described as of vigorous constitution. The measurements of the infantile heads are also given in some instances. As a rule they are within normal bounds or slightly below normal on account of the overlapping of the bones.

The reports about the loss of fat and weight do not always coincide. The expected loss of weight is present in the majority of cases and is most marked in those patients who have been subjected to treatment several times. It is more marked still in patients with intervening pregnancies during which they received no treatment. At times the loss in weight was slight; in other patients there was no loss in weight. It is a mistake to explain this apparent fact by the failure of the patients to carry out the strict regimen of the treatment or their subjection to it for too short a time, which happened with a few patients, or to gloss it over in any manner.

We cannot expect success from a method of treatment alone when we are not thoroughly acquainted with its workings; invariable success would in fact lead to suspicion in scientific minds. To look for the cause of the failures may throw more light, as it often does, on the whole subject. Both of my first failures occurred in exceedingly fat women. Under treatment there was a rapid and great loss in weight in the mothers, while the influence on the fetus was but slight. This fact showed the need of commencing the treatment at an earlier period in fat women. The truth of this statement was clearly demonstrated at the subsequent births of children of much less weight. In both women, however, the confinements were much easier, compared with the

previous ones, notwithstanding the small influence exerted on the weight of the child.

Detailed reports of the condition of the mothers are lacking in the remaining cases in which there was no loss of weight in the children nor any loss of fat or diminished bloating of the skin. Regarding the weight and size of the children, wherever they are given it seems even in these cases that the preceding children were still larger and heavier. At any rate the favorable course of the birth is typical in all cases.* Continued trials of this treatment will certainly explain more clearly the causes of failure and its manner of working.

Before attempting an answer to the opponents of this method of treatment we must admit that the results of induced premature labor have improved very much since 1885. The mortality has decreased considerably among the mothers. With some operators (Ahlfeld) there is almost no mortality. In institutions too the mortality has been lowered by an improved aseptic technic. In private practice, in a consulting practice especially, the results are not so favorable, but that there is an advance for the better cannot be denied. Sad experiences with children were the chief cause for the introduction of this treatment. In this direction too the results are more favorable than in 1885. According to the papers of Pestalozza, Fehling, Buschbeck and Sarwey, 80 per cent. of the births in institutions result in living children and 70 per cent. of the children are living at the time of dismissal. Sarwey proved that out of 36 infants sent from the clinic to the country 28 (that is, 75 per cent.) were living at the end of one year. In this regard, too, the results in private practice especially in large cities is not so favorable. Still there is some improvement without doubt. My own statistics gathered since 1885 are limited in number. Among the children whose mothers had submitted to treatment I could follow the fate of twenty-two for a few years. Some of these children I have followed up to the present time. All were well developed at the end of the first year. One died with scarlet fever when 1 $\frac{3}{4}$ years old, another with diphtheria when 2 $\frac{1}{4}$ years old. A third succumbed to an accident in the third year of life. For the same period of time I was able to follow up twenty-four children after induced premature labor, some from my ordinary and consulting practice, others through the kindness of colleagues. Two of these children died during labor and five in the

*Attention must be paid to differences of race. According to the statistics of Holland, for instance, it seems that the Dutch women, those of Friesland, especially, give birth as a rule to quite large children. Accordingly a child's weight of 3,200 to 3,600 gm. must be regarded as moderate.

first year from slight causes such as gastric disturbances. Three others died when two years old from children's diseases. At the same time these premature children had the better chance to thrive as they were nursed by their mothers or by wet nurses. All children belonged to the middle or wealthy classes. Admitting the better results obtained at present with induced premature labor, nevertheless the above experiences certainly justify us in developing more fully a method of treatment which offers no greater danger for a certain number of women and at the same time assures better prospects of life for the children. With this aim in view I proposed this treatment as a substitute in 1889. It was never my intention to eliminate induced premature labor, which has proved so valuable and useful in practice. Still less was it my intention to substitute my treatment for Cæsarean section, as mentioned previously. My only desire was to limit the indications to a certain class of patients. The great majority of contracted pelves met in practice are only moderately so, with a true conjugate somewhat below 8 cm. The higher degrees of contraction are in the minority. In the moderately contracted pelvis we frequently see in the same woman easy confinements alternating with difficult ones. With the exception of some peculiarity of the child's constitution or of unfavorable presentations, the weight of the child is usually the cause of the varying confinements. Against this our treatment must be directed by selecting and supervising the diet of the mother. Even with the greater progress of induced premature labor it will be followed in private practice at least by disease among some of the mothers and with great uncertainty regarding the fate of the children, notwithstanding incubators or other artificial appliances. Some women again will refuse to submit to the induction of premature labor on account of the fate of the children. Still other women suffering from some disease, as gonorrhea for instance, we dare not expose to its unavoidable dangers. It is certainly desirable to have other means at our disposal for such patients. My convictions remain firm, notwithstanding the objections to my method of treatment.

It will not be taken amiss if I refuse to enter into a discussion with those authors who without any trial condemn any new idea or any modernized idea, as is the case with my treatment, which bears the stamp of approval in historic medicine, or who see in the treatment the ghost of tuberculosis.^{57, 58} There is no fault found however with the teacher who omits to mention a treatment in his book which has not been established as yet and which has not been sufficiently tested scientifically and in practice. When, however, the treatment is mentioned it

ought to be tested properly even if it is rejected finally. This is the case with Eisenhart, Löhlein, Ahlfeld, Kleinwaechter and others.

The chief objection to my method of treatment is the lack of certainty in the attempt to influence the child through the diet of the mother. That is the reason why Ohlshausen, Veit and Schroeder in the latest edition (1899) of his *Obstetrics* (p. 317) maintain that the treatment is not based on "sound principles." In my opinion this statement is not correct. Without doubt we have not as yet mastered the influence the diet of the mother has on the child; this much is admitted without reserve. Still with such experiences as has been detailed it is but necessary to continue our investigations to approach the solution not only of this relatively important question but also of very interesting and important problems. At the same time every success attained or failure recorded is decisive and of great importance to the practice of obstetrics. Whatever uncertainty of success may cling to my method of treatment, the same holds true for induced premature labor, which shows a much larger mortality and less vitality for future development on the part of the children. Every series of investigations earnestly carried out with intelligent patients conscious of its importance will throw more light on the subject. With the material at hand so much has been accomplished that at least I have blazed the path for other interested investigators to follow and have pointed out the prime importance of these studies.

The second objection to my treatment consists in "the denial of food and the treatment by starvation" as described by Ohlshausen and Veit. This objection with the possible evil effects on the mother is also raised in other quarters,^{44, 50} especially by Ahlfeld. This is certainly a wrong conception of my treatment, brought about by the fact that in the first report on the subject I used the expression "treatment by restricting the diet." Pregnant women are not restricted in their food, only in the quantity of fluids. Besides, the restriction in fluids does not go beyond the amount with which they can dispense without injury. The amount of food allowed is so plentiful that both mother and child thrive on it, differing in this respect from the treatment customary in former times and in a certain sense also from a similar procedure lately proposed by Lohmann. The danger is one of quality only, consisting in an increase of albumin, a slight diminution of fat and a greater diminution of the carbohydrates. Based on the investigations with adults, an influence on the child was to be expected theoretically with such a change in the diet, provided the influence exerted on the child by the feeding of the healthy mother holds good for human

beings as it does for domestic animals. Of course this is simply supposition on my part. In the modern sense of the word the procedure cannot be called "treatment by denial of food" or "diminished feeding." The correct name for it is "dietetic treatment."

Ahlfeld* thinks that pregnant women require daily 40 caloric units for every kilogram of weight. That is 2,600 caloric units for a bodily weight of 60 kilograms and a corresponding increase or diminution according to weight. According to all the investigations on metabolism, such a number of caloric units is required only in men who are continuously employed in hard physical labor. As soon as the work becomes easier a smaller number of caloric units is required per kilogram. Women require a great deal less and for women 65 kilograms in weight the absolute requirement is certainly below 2,000 caloric units. Women advanced in pregnancy are not as a rule forced to work hard for any length of time. How are pregnant women fed in institutions? I have at my disposal the statements of P. Baumm and H. Gassner about the Woman's Clinic in Munich, under control of Hecker and von Winckel respectively. According to Baumm, in v. Winckel's time the number of caloric units allowed was 1,420 to 1,430 a day at a liberal estimate, while in Hecker's time it was still less. Still as a rule the inmates of the Munich clinic are heavily built. (See Baumm's and Gassner's figures). Baumm states that the increase in meats and the diminution in the amount of beer they received at the clinic were better for the patients than the diet they received at home. Both mothers and children showed an increase in weight.

I doubt very much whether the government of Prussia grants to the managers of the institutions an allowance averaging 2,000 caloric units a day for each pregnant woman for weeks and months, unless the patients are overfed with cheap artificial fats or with carbohydrates. Such a diet would result in large but not vigorous children and a number of confinements would be made more difficult needlessly.

Lohmann's¹⁴ propositions include a still smaller number of caloric units and on that account cannot be dismissed without discussion. Lohmann mentions his wife as an example. His reports of the appearance and weight of the children correspond with my experiences. We cannot, however, diminish the quantity of albumin to such an extent as was done by Lohmann in women with poor hygienic surroundings who are forced to do a moderate amount of work, which is usual with the majority of our patients but was not the case with Lohmann's pa-

*Compare the various divisions relating to the subject in the books of Leyden, Rubner and Weil.

tients. His success, however, is just as worthy of an investigation as mine, even if we do not acquiesce in his usually fanatical and one-sided view, as for instance that poor constitution of the blood is the cause of all diseases. At any rate this goes to prove that in this respect we must be careful in estimating the quantitative value of a diet in pregnancy; that is, its number of caloric units as opposed to its qualitative value.

Finally it was stated that my method of treatment is too expensive. That is not so. We have such a plentiful supply of cheap meats and fats and so many cheap substitutes that even for people in moderate circumstances treatment carried out for about three months will be cheaper than an induction of premature labor. It would be cheaper still if Lohmann's suggestions could be carried out for people of moderate circumstances. The most important aid to the treatment however is the good will of the patient. When this is absent and cannot be aroused by motherly instincts or by the admonition of the physician to the practise of restraint in the first two or three weeks the treatment will fail. The unwillingness to submit to treatment is more frequent in inmates of institutions but it can be mastered by unremitting personal influence just as well as in private practice. In large cities this treatment has become more popularized during the last fifteen years even among the laboring class. Where the good will is lacking this treatment is unsuitable and induced premature labor is to be employed.

In conclusion I desire as to the two questions discussed above to emphasize that I am aware their basic principles are not fully determined as yet. We must alter our method of treatment with every change in the deductions obtained in the continued study of metabolism in pregnant women especially. I will be among the first to abandon the treatment, provided it is followed by a series of well-attested failures. Still this would be only temporary, because the idea of the relation between the condition of the mother and the character of the confinement and between the nourishment of the mother and the development of the fetus is so logical and essential in nature. That this relation exists we cannot as yet prove on account of our lack of knowledge and the insufficiency of our investigations, not because this relation does not exist in nature. This knowledge will be gained sooner or later and the treatment will then be simplified accordingly. As is usually the case in the history of medicine, practice cannot wait until theoretical knowledge and exact investigation have smoothed the path which leads to a cure. On the contrary, practice continues in its own way until scientific investigation has wholly or partly approved the method of procedure.

On that account I can conscientiously recommend my treatment to practising physicians. It will not harm any patient. On the contrary, it will insure many an easier confinement and more vigorous children.

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