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Effect of diet of the mother upon the new born

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THESIS

The Effect of Diet of the Mother Upon the New-Born.

By

A. A. FUHLBRIGGE

April 15, 1931

480949

The influence of the pregnant organism through the development of the foetus has been investigated in many ways and also the effects of various diets upon the embryos. Still there remains a great controversy among obstetricians as to the effect that the diet of the mother has upon the new-born. I am going to try and present some of the work that has been done on this subject and try and draw a few conclusions from the work that has been done. The assertion has been made in the literature: "The foetus develops without regard of the mother's organs and deprives it of its vitality as a parasite of whatever it needs for its development." ¹⁴ Jonen states that in spite of chronic undernourishment of the mother the embryos do not suffer. Some of the work that has been done will disprove this statement, which I will try to show by presenting experiments and cases.

"Thereupon referring to the animal experiments which were undertaken partly without and partly with a definite cost; but the questions do the foetal organs build up without the regard for the mothers stature so long as any kind of nourishment was given, could not be definitely decided. What would we have to expect, when the opinion is that the foetus draws all its necessities from the mother's organs to exist right, but still, the pregnant organism with complete nourishment through the development of the foetus was completely destroyed?

In order to answer this question it appeared advisable to withdraw all nourishment at the beginning of pregnancy. Dr. P. Jonen and Dr. Rupp experimented on dogs. The animals were chosen, that they were about of the same weight as the table will show. Every time that the particular animal showed definite signs of inanition, the experiment

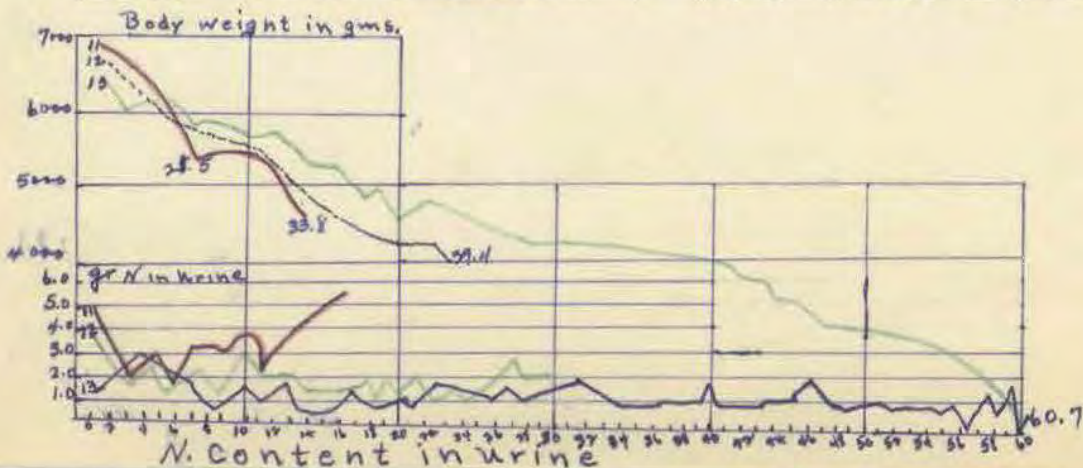
was stopped. This point of time occurred in fourteen days in the first dogs with a 30% loss of weight. In the meantime she aborted, which was shown by microscopic sections of the enlarged uterus and by the visible attachment of the placenta.

The second showed signs of inanition on the 27th days with 39% loss of weight. Here it was shown with sections that the animal was still pregnant, but could not be definitely stated whether the embryos present died previously or at the time the mother was killed. The embryos however were smaller than would be expected of embryos at that age (27 days). The dog# used for control died after 60 days with a loss of 61% of its body weight. The third pregnant dog was much heavier than the others. She aborted completely and lost 44% of her body weight in 31 days after which she was killed.

During the experiment the dogs were weighed daily and the nitrogen content of the urine was investigated.

Body Weights Table

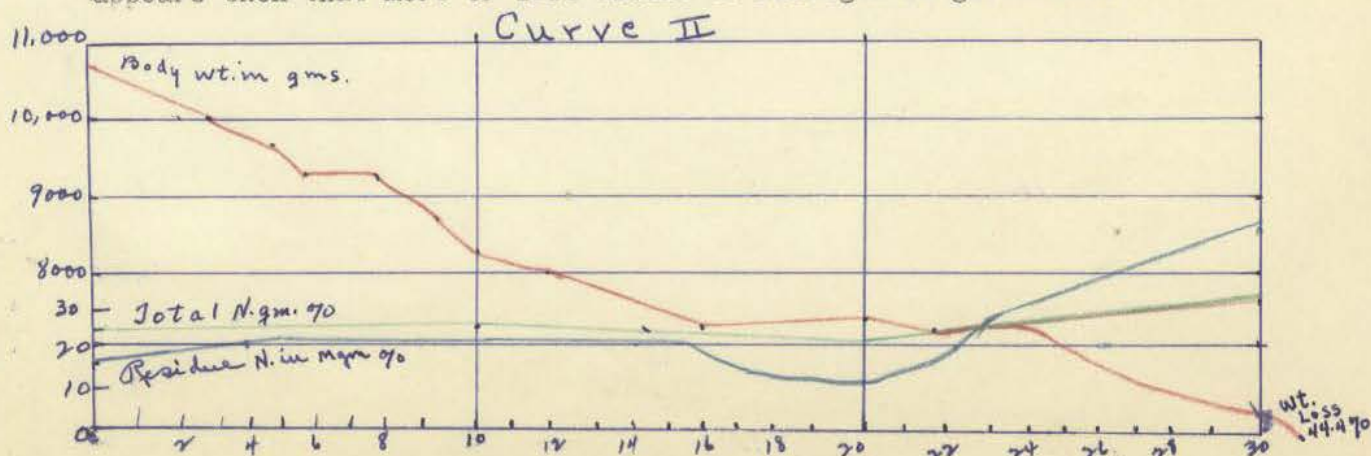
Experiment Number.	Beginning Wt. in gms.	Killing Wt. in gms.	Weight Loss in %	Days of Inanition.	Remarks.
11	7,000	4,900	30.0	14	Complete Abortion.
12	6,850	4,150	39.4	27	Incomplete Abortion.
13	6,750	2,650	60.7	60	Control.
14	10,700	5,950	44.4	31	Complete Abortion.



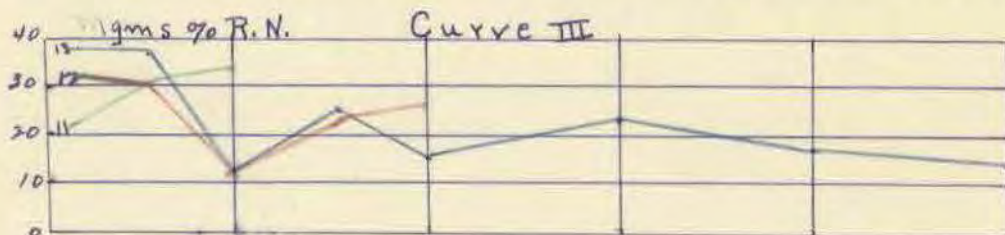
In this second table the weights are entered above and below the nitrogen content of the urine of two pregnant dogs and one control. The weight curve of the first dog drops more rapidly than it does in the other two. At about the eighth day the weight remains stationary. This is perhaps due to the fact that the dog aborted and consumed its products of conception on that day. Then the curve falls farther until the 14th day, on which day the dog was killed. In respect of this rapid fall in weight the nitrogen content of the urine curve rose higher in the first day than in the other two. This was as was accepted due to the fact that the dog had been used to a rich albumin exchange from the beginning of the experiment. At the end a definite praemortal nitrogen secretion appeared.

The weight curve of the second dog runs about parallel with the control. On the 27th day the dog was dying and therefore had to be killed. Also the nitrogen secretion is higher than that of the control.

The control dog lived for 60 days, more than twice as long. Her nitrogen exchange, as we see, is much less than the other two. This animal could store nitrogen. It brings out quite definitely the single hunger phases. First after the accustomed nitrogen exchange as in the beginning of the experiment, then to put into use the less important albumin or protein, as is known the starving body will next burn the carbohydrates and fats. At the end of the experiment it appears then that more or less amount of nitrogen is given out.



The weight curve of the third pregnant dog, that was about 50% heavier than the others, lost weight regularly until the 17th day, then she remained stationary for three days, undoubtedly due to the fact she aborted and devoured the products of conception. Thereby the animal could spare its own substance. On the twenty second day the same thing occurred. (second abortion). Then the curve drops more rapid. On the 31st day with a 44% weight loss, the animal was killed.



retained N at Rest in Dogs 11, 12, 13.

The resting Nitrogen curve of the first three dogs answers the already shown urine nitrogen value. Peculiarities over the resting nitrogen curve of the control dog are not expressed. Likewise the total nitrogen is retained in the blood.

These experiments show that, of the three pregnant dogs, two aborted before they were dying; the third at this time was killed and found that the embryos were much smaller than would be expected of normal embryos at that age. The real cause of the abortion can be interpreted in several ways. Particularly through the exhaustion of the mother's vitamins, whereby the development of the embryo is stopped, especially it can be interrupted. Even then the mother's lived several days longer than the embryos. So that the reported assumption appears, that the mother's body, as soon as not enough nourishment for the develop-

ment of the embryos is at her disposal, not to harm her own depots that are important for life, the products of conception are destroyed and cast out of the body. Before this happens the development of the embryo has been injured through the starvation of the mother. The embryo becomes undernourished and by further undernourishing they die. Thereby it appears that the embryo develops without a doubt on the condition of the mother's body, at least as far as this experiment will let us state, only to be correct to a certain degree." 14.

C. U. Moore and Jessie L. Brodie and R. B. Hope of the Collins Nutritional laboratore work with rats. They showed that diet adequate for reproduction may be inadequate for lactation. They used kale and spinach as the sole source of vitamin B. "The mothers grew normally and had full-size litters but 63% of the young died in the first four days of live, and 30.6% died just prior to weaning at 20 to 22 days. To test whether the dietary deficiency was both pre and post-natal two litters were inter changed. The one mother raised on synthetic diet including 2% yeast and another female raised on ordinary stock diet (milk, table scraps and McCollums stock grain mixture) both bore young on the same day, a litter of six each. Right after birth three of the young were interchanged. During the first ten days little difference was noted in the growth of both litters. Then the young nursed on the mother fed on the synthetic diet began to lose weight and appeared anemic. On the 12th day all three of the young born of and nursed by this mother developed marked paralysis and died two days later. Autopsy findings--intra-cranial hemorrhages. Hemorrhage in liver, lungs, dorsal mesentery and thymus. Brain and oord formless.

On the 15th day, just after the death noted above, the three born of the stock mother, but nursed by the mother reared on synthetic diet, showed the same type of paralysis and died in two days. At autopsy the following pathology was found. Extensive hemorrhage of both cerebral hemispheres in one; hemorrhage in the thoracic and abdominal viscera in all three. In two the thymus was less than half normal size. The sciatics of both groups showed marked myelin degeneration.

In the meantime all six of the young nursed by the mother fed on stock ration were successfully weaned. One of those nursed by her and born of the mother fed on synthetic diet was killed at four weeks of age and at autopsy no pathology was found. The remaining five developed to maturity uneventful. This experiment demonstrates that milk from mothers on an optimum diet may overcome to some extent deficient prenatal development, while milk from mothers on a deficiency diet may counter balance an optimum prenatal development. The hemorrhagic conditions found in these cases is not analogous to that of scurvy and has been demonstrated by the fact that the inclusion of 12 percent lemon juice in the drinking water gave no beneficial results and also the vitamin B content of the lemon juice did not prevent the polyneuritis. 11

Work done by J. R. Slonaker and I. A. Card on the effect of restricted diet on the number of litters and young born shows that restricted diet in rats led to impotency. The fecundity of the animal became greatly reduced. The animals lost their power of reproduction by the third generation and the line of descent became extinct and that animals still capable of reproduction were restored to nearly normal conditions by an omnivorous diet. 12

McCollum worked with white bread with very limited bread supply. Rats fed upon a diet as described above from weaning-- equal weights of white bread and milk, or four calories of bread to one calorie of milk, produced a litter of young at an early age (87 days) but none of the young survived. She was immediately remated and a second litter of young was born within a month but these also died, as did those of the third litter produced on same diet after a long interval. This shows that a diet of equal weights of bread and milk sufficed for normal growth and early reproduction but apparently did not suffice for the rearing of the young.

On a ration containing the same proportion of milk but with ground whole wheat instead of white bread or patent flour, young were successfully suckled, but the mother lost considerable weight. The young grew to maturity at a somewhat less than the average rate, and in several cases have produced and successfully suckled young of the third generation.

When the proportion of milk was made larger so as to constitute two-fifths of the total calories of the food mixture, the rest being ground whole wheat, the mother suckled the young with-out undue loss of weight and the young made a fully normal rate of growth, as have also the young of the third generation.

A female, which has been starved in early life by feeding upon bread alone, resumed growth at a normal rate when fed equal weights of fresh bread and market milk and later, when fed with a mixture of one part whole powdered milk to two parts of ground whole wheat, was able to produce healthy young and suckle them successfully, so that they grew at a fully normal rate and one of them at an early age produced vigorous young of the third generation. 2

The knowledge, which has been acquired thru many experiments, about the interchange of vitamins in the foetus has advanced so far that we can draw definite conclusions as to the practical application to medicine. The vitamins needed by the foetus must be furnished by feeding of the pregnant mother.

The necessity of vitamins for the foetus are important. We get the best idea of this question when we take into consideration which vitamins can always be demonstrated with certainty and which vitamins are needed for the development of the foetus, which way the vitamins are utilized, if and how it is stored has hypovitaminase or avitaminase during intrauterine life or becomes utilized first in the extrauterine life.

"The antixerophthalmic vitamin A is the important vitamin for every form of growth and therefore also makes possible the growth of the intrauterine life. Vitamin A is demonstrable in the liver of the foetus quantitatively and qualitatively by the use of dyes.

Through the investigations with the dyes of antimony-tri-chlorid and arsen-trichlorid the Germans found the positive in all cases. They found that the liver contained the vitamin A while the other organs of the foetus were free of this vitamin. The Germans concluded then that the foetus needed a definite amount of Vitamin A for its development. The metabolism of this vitamin in every period of pregnancy is not the same because the growth from one month of pregnancy to another changes rapidly. We can say off hand that the growth during the second half of pregnancy is more rapid than during the first half. During those periods of more rapid growth of the foetus a larger quantity of Vitamin A is used. The natural diet during pregnancy is not changed and it would be impossible for the diet, to be changed so markedly when the

the foetus suddenly begins to develop more rapidly, to supply sufficient Vitamin A for this rapid development. Therefore the foetus has its reservoir of Vitamin A in the liver depot to be used as the development of the foetus increases in rapidity. The **reserve** of vitamin need not be large as long as it is kept at a balance which is accomplished through the diet of the mother.

The **antineurotic** Vitamin B, the following observations have been made by Reyner. He observed that patients suffering from beriberi gave birth to premature babies. He speaks of an inborn ^{to}devility due to the lack of Vitamin B. He then brings up the questions as to the intra-uterine damage. The vitality of such premature births is greatly endangered. Habitual premature births can cohere with a deficiency of Vitamin B in the mothers diet.

Vitamin C, the **antiscorbutic** vitamin. We possess our knowledge from the human pathology. The clinical observations were built upon on the experiments of E. Walkhoff. He experimented on guinea-pigs, which were the best for this purpose. The result of hypovitamin C showed itself in the mothers and foetus. In the mother a hyperameia of the capillaries of the bone and also in the pulp of the teeth. Later the red blood cells were destroyed. The endothelial linings of the blood sinuses of the spleen were filled with haemosiderin. As the disease progressed the hamaglobin decreased and a porous bone and a marked atrophy of bone occurs. In the embryos the bone structures were involved while the spleen was normal. The blood building cells of the bone marrow was distinctly changed. The bone building cells were atrophic. The osteoblasts shriveled together to flat endothelial like cells. The enamel substance and the pulp of the teeth was changed mostly. O. Walkhoff came to the conclusion that a good supply of vitamin C in intra and extra uterine life is the best prophalaxis for caries of the teeth." 15

" After the conception of O. Walkhoff the whole prophylaxis against caries of the teeth must be carried out during growth of the teeth. Pregnant women should get a rich diet. But the infant and child must be nourished with a diet that is rich in vitamins. Only and alone by such means are the natural anlage present for a good temporary set of teeth and also for a good permanent set of teeth. Reyher carried O. Walkhoff's work from the guinea pig to the human picture. He had the privilege of observing six cases and discusses one in detail. A 27 year old primipara gave birth to an eight months old foetus. The foetus was dead and measured 42 cm. long. Histological examination of the liver, spleen, heart, and lung were normal. The important change was noted in the bones. The osteoblasts of the endosteum and of the periosteum showed marked deficiency. The capillaries of the bone marrow were hyperemic. The megaloblasts were greatly changed. All these pathological anatomical changes simulating the osteogenesis imperfect. Reyher brought about by a hypovitamin C diet.

About the Vitamin D. The antirachitic vitamin we also have one observation on a human being. This was observed by Abels. A mother giving birth to her first child which weight 3000 grams. She gave birth to a second child which weighed 4800 grams without changing her diet from the previous pregnancy. The only difference was that during her second pregnancy and because of a cold abscess she took a tablespoon of codliver oil twice a day.

Paulsson made some accurate observations in which that the children would habitually die at term and he successfully combated this condition by giving the mothers cod liver oil. He had one case in which he gave the patient vitamin A and D, and the mother gave birth to two normal living children and previous to this four children had been born

and died after birth without reasonable cause." 16

Blackman and Vignes of Paris seem to think that the quantity of food ingested by the mother exerts a certain influence on the weight of the new born as shown by the cases that are cited below.

"Miss G. menstruated at 13 years. When fifteen Hartmann operated her for appendicitis. Much concerned over becoming overweight she began to fast, going as far as a state of mental anorexia which was occasion for great worry for her family. Marie, at twenty, menstruated eight days ever twenty eight days and was for two years involuntarily barren, then pregnancy ensued at 22 without treatment.

Her last menstruation was the week May 20-28, 1926. She did not have any malaise, having to the contrary less constipation than before becoming pregnant, but her anorexia began to get worse and in spite of her, thru a vicious circle, well known, gained a foothold through her privation.

First visit at the beginning of September: tall girl, very small and slender, blue eyes, teeth normal and well implanted; uterus gravid and four fingers about the symphysis, deviated to the right of the median line; left ovary enlarged; measurements: bispinous, 21, bicristal, 25; promontory not felt by introduction of one finger; lateral parts easily explored, anterior arc, very round.

Diagnostic: Pelvis of small dimensions.

Prognosis as to delivery: Possibility of a spontaneous delivery if the child is small; possibility of a caesarian if the child is normal size or larger. In any case the decision would not be made before term or perhaps the beginning of labor. Nevertheless one could hope that the child would be small because the father and mothers were both tall and slender.

Concerning Mrs. G. it certainly can be reasoned that her slimness

must be an acquired characteristic in the course of her intra- and extra-uterine development, seeing that her father, mother, and brother are tall and slender. It is probably not a question of familial or genetic character but an accident of growth.

Concerning Mr. G. He is a short man, but well built, well proportioned, and robust. The height of the father is an important factor for constituting a resumption as to what the height of the fetus will be. It is that which Mauriceau while teaching has said 'the women whose husbands have large heads and large strong shoulders give birth to large children who resemble them in that. The finding is not absolutely constant, but presents itself very frequently and our classics such as Levret, Dubois, Pajot have always called attention to it. On this point Torre has done research and collected statistics which illustrate the frequency and which I have included in the following graphs.

On terminating this first visit in which I ignored the state of mental anorexia, ~~Mme~~ Mme G. questioned me incidently on the regime she was to follow. She indicated to me that her parents tyrannized her, forcing her to eat more than she had any need of.

I am of the opinion that a large number of pregnant women eat too much, surrendering themselves to a badly controlled instinct and excusing themselves by the aid of the saying 'It is **necessary** to eat for two.' This overeating has three principle drawbacks: the first is the encumbering of the organism with waste products and increasing the work of the liver and kidney already overworked; the two others which complicate the mechanical problem of delivery are the fact of having a too voluminous child and the fact that the good fare augments through humoral modification in certain women predisposed to contracture, the difficulties due to uterine spasmodycity.

My response to Mrs. G. again another time I ignored the mental anorexia. I do not doubt but that I will be strictly obeyed and even more than strictly. The fear of a Ceasarian aided Mrs. G. in not eating much or to be more exact in not eating at all. From this fact she gained many worries which she imparted to her company, which I did not remain to share.

However the gestation continued with the following particulars: height of the uterus 10 cm. Sept. 25, 119 days; 19 cm. Nov. 25, 184 days; 24 cm. Jan. 16, 242 days; and the same Feb. 17, 269 days.

Head well engaged Feb. 2 and 17.

Uterine contractions during ten days at the end of November.

Considerable edema of the lower extremities Feb. 2.

No albumin.

Normal B.P.

Pulse varied 72-97.

Maximum of voluntary apnea occurring in the morning varying from 21-41.

Slept very bad and later insomnia during the entire night.

Headache early in January.

Enteritis at the end of Dec. and periods of constipation.

Extreme asthenia and lassitude more habitually.

During all the gestation, Mrs. G. whose normal weight was 41 kilos, gained only 800 grms.

At the end of January I prescribed injections of cacodylate to 20 centigrams, four of which were given.

On the 23rd of Feb., 275 days, at two o'clock Mrs. G. had the first pains. At 11:30 dilatation was complete. Labor progressed regularly, pains good without excess, pauses between pains were perfect. At 12:30 a.m. to spare the strength of the patient I did a low forceps and delivered a baby girl who weighed 1680 grms. and measured 40 cm. The placenta weight 475 gm.

There was not much bloody fluid at the time of delivery. Three quarts an hour after. There was a small hemorrhage which was not repeated and which was due to a slackening of the uterine tone.

We have then, on the whole, a very satisfactory delivery. I have remarked that the pregnant woman restricting herself to a poor diet deliver with difficulty. It is well known that youth favors a state of vagotonia and that overeating on the contrary is often a factor of sympathicotomy. I have observed and taught many theories on the anomalies of contraction. I think that one must search for an explanation for this easy labor. On the other hand the small dimensions of the child permitted its engagement and expulsion.

With respect to the small amount of hemorrhage at delivery it is a phenomenon that I have observed in other cases of inanition because of mental anorexia. This clinical history brings a certain number of reflections in maternal nutrition in the course of gestation and on reports of fetal nutrition.

The weight of the woman increases during gestation, deduction being made for the weight of the ovum and the weight of the hypertrophied uterus. This gain has been observed to be more rapid in the third trimester. Zangemeister, 1916, made the statement that the gain in weight (woman and ovum) is uniform until the twenty seventh week, then she should become thinner, which is more apparent at the end of the thirty sixth week. She reaches a mean total of 5.95 kilos for the last trimester, being 55 grams per day. Lorexzen, 1921, obtained a mean of 69 grams per day for the same period. Davis noted a mean gain of 1.138 kilos. Hannah watched the total gain of 103 multiparous and 108 primiparous women, about having a gain equal to the inferior of 6.750 kilos and the other half a larger gain, and one loss in 14 multiparas and eleven primiparas. Kerwin gives a mean gain of about 7.5 kilos. Mons, observing at Lyons in the service

and clinic of Trillat, arrived at a mean figure of about ten kilos, and I have reproduced his work, modified to conform to the rules of graphical statistics, in the following graphs by which one may figure the gain. To appreciate the actual gain of the woman it is necessary to deduct from these figures the weight of the fetus, the appendages, and the uterus.

The increase of weight in the case of Mrs. G. is insignificant and if one considers the weight of the fetus and its membranes it must be that she lost during this period.

Was the nutrition of Mrs. G. responsible for the smallness of her child? It is a point which is difficult to decide. The baby G. was not full term from the date of the last menstruation and had the height and weight of a child of seven months. Does this have any connection with the undernutrition of the mother and from a more general point of view does it attach any importance to the food intake of the mother as a guide to the weight of the child. This problem is not definitely elucidated.

It seems that overnutrition has for its effect the increase of the weight of the child. Davis arrived at this conclusion and compared maternal gains with the weights of the new-born:

Mean maternal weight gain	Mean weight of New-born
7.025 Kilo	3.144 Kilo
10.107 "	3.569 "
13.688 "	3.620 "

Pons arrived at conclusions of the same order and one can judge from the graph I have made, based on his data. Freidman came to analagous conclusions.

It is not sufficient to demonstrate that hyponutrition diminishes the weight of the child. It is possible that this eventually happens sometimes but it is surely far from being constant. Smith (Lancet, CXCI, 1916) page 54, noted a slight diminution of the weight of the new-born, but it does not seem to him to be clearly charged to a hyponutrition and with it

there was an increase in the fetal mortality, premature births, and still born.

The German and Austrian authors, in spite of the effects of the dietary restrictions during the recent war, have not noticed a constant diminution of the weight of the newborn.

There is in the embryo and the fetus a force of growth, such that to realize its need it calls on the reserve nutrition of the mother and leads her to a cachexia if not sufficient nutrition is taken to repair the effects of these deprivations. The classical experiences have shown the fetus develops itself, thus, in the most satisfactory manner. They show besides that in a certain degree of inanition, there is a breaking in the feto-maternal symbiose and a premature labor. More often if one is placed in severe experimental conditions, the mother succumbs after the miscarriage and the same thing happens to the fetus rather often in spite of the fact that its weight may be a little more satisfactory." 13

In the case of Mrs. G. must we incriminate the dietary restriction to explain the low weight of the child? Perhaps, but perhaps also, it is necessary to incriminate the effects of the dystrophy which she exercised on herself to make herself slender.

From a practical point of view it is not necessary to rely upon, save in rare exceptions, dietary restriction to escape the problem of bony dystocia in the manufacture of very small infants as Prochornick had proposed. To the grave cases the precise rules of the obstetrical classics are applied, but in the limited cases it is interesting to know that the absence of nutrition perhaps constitutes a useful aid in preventing the manufacture of too large infants and also, as I have indicated increasing the tone of the uterine muscle.

For to terminate the history of Mrs. G. here is the histologic ex-

amination of the placenta without signs of placental infarcts; general structure normal; the villi are of normal dimension; capillaries are numerous and permeable and envelope plasmodial masses without abnormal proliferation; several distorted villi present from place to place, trains of fibrous necrosis; no coagulation in the intervillous spaces; several areas of calcareous deposits of microscopical dimension; no vascular modifications; membranes normal.

Let us go then to the history of Baby G. This child, thin and small did not inspire us with a great deal of confidence. I had it dressed in cotton, placed in a well heated room and prescribed for the first day the milk of a she-ass. In spite of that the weight decreased 155 gm. in two days to descend to 1.710 kilos.

First examination by Blechmann Feb. 25, 3 days after birth: The infant presented after the classification of Morfan, the signs of grave debility, that is to say, a weight less than two kilos, a height of 40 cm. and signs of functional imperfection of organs.

No congenital malformations.

Facies: head small, face reddened, and thin, resembling one of athrepsia in the process of losing its fat.

Skin flabby, epidermis wrinkles and the layer of adipose is very thin everywhere.

Respiration: feeble and irregular.

Circulation: cardiac sounds feeble and the rate is a little slow.

Digestion: Movements of sucking are slow and feeble and deglutition is slow.

Treatment prescribed: Nursing: in case of failing of mother's milk, the milk of a she ass is the best nourishment for the debilitated and in these circumstances it is perfectly permissible to administer it every two hours, then every two and a half hours in increasing doses.

Stimulant: we at first prescribed an enema of 5-15 cc of serum glucose at 47 degrees and as this did not seem to help a daily injection subcutaneously of 5-10 cc of the same serum for a week was given. Specific: Congenital debility must lead one to think of its origin in congenital syphilis. Although we have no external evidence of peripheral or visceral involvement, we used an antisyphilitic treatment with the aid of a solution of lactate of mercury, a 1-1000 solution, one drop three times a day in a little milk. This medication is admirably tolerated.

As you see we have used for treatment of a specific congenital possibility, lactate of mercury. We think it wise to give several details on the value of such treatment: One knows that the liquor of van Sweeten yet holds the favor of certain syphilographers. Nevertheless, in the adult its use brings out very bad gout and has an irritating action on the stomach, etc. These inconveniences are again met when it is used in the treatment of congenital syphilis.

For the adult Gaucher has proposed a substitute for this preparation a solution of lactate of mercury; there is less disagreeable gout and less gastro-intestinal irritation. Marfan has employed it in the following manner in a number of cases of syphilis of young infants where he judged that the oral route could serve for the introduction of the mercury into the organism. On the whole, the results have been satisfactory.

Advantages: Good preparation when one considers the contra-indications for friction such as eczema, prurigo, strophulus, pyoderma. It is rare that a nursing appears to have a dislike for the milke in which the medication is mixed and one rarely observes digestive troubles. It is the medication of choice in nurslings presenting the malady of habitual vomiting.

Disadvantages: It is not always easy to procure a good preparation of lactate of mercury and on the other hand its use does not always permit a masking of the treatment. Intolerance cases exist, especially in those

nurslings artificially fed. In certain cases after several days of treatment a diarrhea appears, 2-3 semifluid movements every twenty four hours. Treatment must then be suspended for several days and begun again with diminished doses.

Dosage: Daily dose of medication prepared in Paris by Lafay is divided into three parts which are placed in the nursing bottle and mixed with milk. In determining the quantity to use one must take into consideration the following points: ten drops of the solution correspond to one mgr of the lactate of mercury. As the sublimate contains 79% mercury and the lactate, 84%, one can administer the latter in larger doses than the bichloride of mercury. The daily dose which is conveniently used is six to ten drops per kilo of body weight, beginning by giving six drops per kilo and even less to test the susceptibility of the child.

In the present case we prudently gave doses of mercury less (2 drops per kilo) than we have estimated as in such a case anti-syphilitic treatment must be used with extreme care.

Examination March 9: weight 2.180; height 43 cm. Infant not recognizable; she is naturally very thin but the face is round, chin not pointed, epidermis is rosy and the layer of fat appears all over the body. Respiration is regular and the heart sound more audible. Each day the child suckles with more vigor and the deglutition is becoming normal. Stools present nothing in particular.

In provision for departure (Mrs. G. has proclaimed her intention of leaving France and taking the child) we have substituted for the milk of the she-ass, sweetened condensed milk which the child took well. We continued the solution of the lactate of mercury to give twenty days treatment in all.

The cord came off March 11, seventeendays; quite slowly.

April 7, 45 days: weight 3.435 kilos, height 48 cm.

June 3, near three and a half months, weight 5.310 kilos.

One knows that the average child has gained one half of the birth weight at this time and weighs about 5.500. This baby G. weighed nearly the weight of a normal child and gained very well in proportion to his birth weight. ¹¹13

Summary:

1. The development and existence of the foetus depends upon the nourishment of the mother.

2. "The foetus possesses an unspeakable vitamin need, especially for vitamins A.B.C. & D."¹⁵

3. "By the insufficient use of these vitamins by the mother diet, the characteristic illnesses of the hypovitamin or avitamin appear. Deficiency in Vitamin B brought about abortions or premature birth with debilitated products. Deficiency in vitamin C brought about the characteristic disturbance in blood formation, in bone formation, and the most trouble was found in the teeth anlage."

4. Since all vitamins can not be formed in all the organs of an animal but enter the body through our diet, it is an important subject of dietetics during pregnancy to supply natural diet rich in vitamins such as green vegetables, fruit, eggs, milk and milk products."¹⁵

5. "With exception of the natural means of supplying vitamins there is another more important way. Cod-liver oil with a high concentration of vitamin A and D, further more dried yeast with its ingredients of vitamin B and D, and Visterol, the important ingredients Vitamin D came into use."¹⁶

6. The occurrence of habitual abortion of premature birth, the habitual dying of the child at term, and the appearance of eclampsia build a very important indication for an early vitamin diet during pregnancy.

7. The hemorrhagic conditions found in cases of dietary deficiency are not analogous to scurvy, proven by adding lemon juice to the diet.

8. Deficient diet, leads to premature delivery and thereby a small child.

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