

OBESITY AS A CAUSE OF STERILITY.

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In all ranks of life there are two well marked forms of senile decay; and every one will at once, I think, recognize the truth of the following sketch by Paget:

"Some people, as they grow old, seem only to wither and dry up—sharp featured, shriveled, spinous old folks, yet withal wiry and tough, clinging to life and letting death have them, as it were, by small instalments slowly paid; such are the 'lean and slippered pantaloons' and their shrunk shanks declare the prevailing atrophy."

Others, women more often than men, as old and as ill nourished as these, make a far different appearance. With these the first sign of old age is that they grow fat, and this abides with them till, it may be, in a last illness sharper than old age, they are robbed of even their fat. These too, when old age sets in, become pury, short winded, pot-bellied, pale and flabby; their skin hangs not in wrinkles, but in rolls and their voice instead of rising toward childish treble, becomes gruff and husky.

Now these classes of old people may represent the two forms of atrophy. Atrophy by decrease and that by degeneration of tissue, to which we shall find nearly every part of the body liable.

Given an obese woman, we will find an excessive accumulation of fat in the adipose tissue, hindering and finally rendering impossible the function of the various organs of the body.

The distribution of this accumulation of fat is seldom uniform, being sometimes in one part of the body and sometimes in another. Particular organs may be greatly encumbered, while others experience very little impediment.

But there is a close relationship between the condition of the internal cavities and that of the subcutaneous areolar tissue, so that an extensive accumulation of fat beneath the skin may be accepted as sufficient evidence of a similar internal burden.

Under normal physiologic conditions of nutrition, the adipose tissue of the body stores up only that amount of fat which is needed for the continuous supply of fatty matter to the tissues of the body. Adipose tissue is present or may be formed wherever there is connective tissue, except in the lungs, spleen, sheath of the penis and in the brain. In the normal condition, it forms about one-twentieth of the total weight of the body.

According to Lyman, the physiologic store of fat is normally recruited from the fats that enter the circulation, either in the form of an emulsion or in derivative combination, forming glycerophosphoric acid, fatty acids and soaps. A portion of the fat is held in solution by the soaps that are formed through the action of fatty acids upon alkaline bases in the small intestines.

Glycerin and the fatty acids are produced by the action of the pancreatic juice and bile upon fat. The liberated glycerin enters into combination with phosphoric acid that has been displaced from the alimentary phosphates by the hydrochloric acid and soap of the gastric juice. Thus formed the diffusible glycerophosphoric acid and soap pass readily into the general circulation, while the emulsified fats find their way through the lacteals and the thoracic ducts into the

venous current of the blood. Reaching the tissues, the glycerin and fatty acids are readily oxidized, while the stable emulsified fats are deposited in the adipose tissue for a more gradual disintegration.

If the fat be introduced into the system beyond the capacity of the soaps and other alkaline salts to hold it in solution, the surplus remains suspended in the form of minute oil globules, giving to the circulatory fluid an oily appearance. This excess constitutes what is termed lipoemia. Under such circumstances, at the ordinary rate of oxidation within the tissues, the surplus fat can not be oxidized and it accumulates in the cells, in and around the uterus, ovaries and other organs and adipose tissues.

When the supply of fat in the blood is too great to be disposed of by immediate oxidation or by deposit in the adipose tissue, it must find its way out of the body. The sebaceous glands of the skin excrete excessively, hence that disagreeable greasy appearance of the hair and skin and eruptions of eczema and acne in the anemic and victims of irregular menstruation.

Among the causes of obesity, Blanchard has noted excess of eating and drinking in about 40 per cent. of the cases; in about 37 per cent. there was a deficiency of exercise, but in 20 per cent. the exercise was extraordinary, and in 10 per cent. the quantity of food was less than the normal amount.

Hereditary influences play a very important part in the evolution of obesity, 50 per cent. of such cases being due to this cause. Hereditary influences that predispose to arteritic disease, retardation of nutrition due to rheumatism, gout, gravel, biliary lithiasis, asthma, acid dyspepsia and kindred diseases. Through many successive generations these diseases may be traced, either associated at the same time in the same subject or occurring in alternation with each other, leaving numerous obese and sterile women in their wake. The preponderance of opinion is with the idea that more frequently an excessive amount of adipose tissue is caused by the ingestion of saccharin and starchy food than by the consumption of fat; in many cases it can be traced to acid dyspepsia, since the action of the pancreatic juice is greatly impeded by excessive acidity in the small intestines; the fats are then absorbed in the form of an emulsion instead of being split up into glycerin and fatty acids. Emulsified fats have a great tendency to become more or less permanently stored up in the adipose tissues, and favored by sedentary habits, malt liquors, etc. Lyman says that the development of anemia and obesity is favored by small but frequent losses of blood; the diminished current of blood can not transport a sufficient amount of oxygen; the exchanges upon which nutrition is dependent are consequently retarded and obesity developed. In like manner the disease frequently accompanies pregnancy, excessive menstruation and lactation, especially if the patient leads a luxurious life and gratifies an appetite for alcoholic beverages and sweet articles of diet. An insufficient oxidation of that in the tissues has been made prominent as one of the causes of obesity. As a consequence of obesity, the internal organs like the uterus, tubes, ovaries, kidneys and pancreas may be completely buried in masses of fat. The liver is enlarged, its borders lose their sharpness, its color is pale and oil oozes from an incised surface; the hepatic cells are gorged with fat, but they are not in a condition of fatty degeneration, and the connective tissue by which they are surrounded is not invaded by fatty particles.

The secretion of bile is greatly diminished, and the gall bladder and large ducts are often found empty, or contain nothing but mucus. The diaphragm is forced upward by the immense masses of adipose tissue that crowd the abdominal cavity. The thoracic cavities are also diminished by the presence of fat in the mediastinal spaces and under the pericardium and pleura. A proper expansion of the lungs is thus prevented, lessening the amount of oxygen given to the blood and thereby increasing the existing condition. Owing to the minute particles of undissolved fat, the amount of oil in the blood may be four or five times greater than it should be, or five or six parts per thousand of the circulatory fluid. The amount of hemoglobin in the red blood corpuscles do not fall below the normal limit.

The blood can not take up and transport a sufficient supply of oxygen under such conditions, and consequently a sense of breathlessness, wheezing, etc., is often experienced.

I have thus given a pen picture of the general condition and have thus described the condition of the liver more closely, to show by comparison the condition of the ovaries which are in exactly the same state, except that the anatomic construction is somewhat different, yet the cause and the results are the same.

The uterus, tubes and ovaries will be found firmly packed into the pelvis and surrounded by layers of fat; the fat cells interspersed between the unstriped muscle fibers and connective tissue surrounding the follicles are so thick and cause so much pressure that it is impossible for the ovum to escape from the ovary; large masses of fat crowding down upon the cervix, bend the canal of the uterus forward, producing an aggravated condition of anteflexion and thereby effectually preventing the entrance of semen to the uterus.

During copulation, the uterine round and broad ligaments by their concerted action cause a suction from the vagina toward the ovaries, greatly facilitating the movement of the semen. When they become encumbered with large quantities of fat, they are then no longer able to perform that function, the semen is then retarded or is lost on its way toward the junction with the ovum in the tube or ovary.

Compression of the tubes by masses of fat obstructing the passage way through the ovarian tubes is another fruitful cause of sterility.

The menstrual blood from fat women is usually pale, scant, watery and poor in fibrin. Amenorrhea and scanty menstruation probably have their origin in the anemic condition of the blood found in obese women who have been afflicted for a long period. The sexual appetite rapidly fails and is often entirely extinguished. Among young girls who exhibit the disease, menstruation usually appears at a precocious age. It is generally irregular, and alternating conditions of amenorrhea are not uncommon, and an increase in the size of the abdomen often leads to an erroneous idea of conception.

The prospects for offspring will depend more upon the menses than upon the amount of fat, which in turn depends upon how great a fatty change exists in the blood, uterus and ovaries. The life of the poorer classes tends to leanness, which calls to mind the old adage "A poor man for children." Leanness only results in sterility when due to starvation or chronic disease.

An obese woman menstruates in varying degrees from a discharge which will soil three or four napkins

daily and continue from one to three days, to only the slightest stain of a serosanguinolent nature, which by its color would be difficult to distinguish as menses. It is nearly always less than normal and in most cases consists of a bloody serum containing a few epithelial scales.

Kish has enumerated over two hundred cases of obesity associated with amenorrhea and sterility. In many of the cases there was no other cause to which he could attribute the sterility, but to obesity. Philbert has described five cases wherein pregnancy occurred through adopting a thorough and vigorous system of hydropathic and dietetic treatment. Their ages ranged from 21 to 27 years. Abortions in obese women are frequent. Stoltz has cited a case of an obese woman who had five consecutive abortions to which he could attribute no other cause. Goubert cites the case of a very fleshy woman, having had eight consecutive abortions from the same cause. McKee sums up the subject in the following well chosen words. "Nutrition takes an abnormal direction and the nutritive elements destined to support the product of conception are directed to other points."

The most favorable cases for treatment are subjects under 30 years of age, and who have not been exhausted from frequent child-bearing. Bunson has shown that the offspring from fat women lack vitality, and many if carried to full term do not survive the teething period. The following description of a few cases may prove of interest:

Miss S., aged 16, began menstruating when 14 years old. After menstruating regularly for about one year she began to take on flesh and the flow of menses grew somewhat less, and just two years from the time they were first observed they suddenly stopped. During the last year she had been confined very closely at the bedside of a sick mother and had been eating largely of sweet confections, etc., until her weight had increased in one year from 120 pounds to 200 pounds; the abdomen was quite prominent; and becoming dyspeptic from the abuse of diet she was adjudged pregnant by her family, a nurse and the neighbors. Her step-brother was accused and confessed to having cohabited with her for the past year; they were duly married and in three months the menses again made their appearance, no pregnancy having occurred. Mrs. H., aged 27, married three times, four children by first husband; began to grow fleshy until she attained a weight of 260 pounds. The menses had lessened to half the quantity and from five days to two days duration. Exercise and dietetic treatments reduced her weight to 225 pounds. She then married for the third time. Treatment was continued until her weight was 190 pounds, when she was compelled to desist on account of the extreme weakness, loss of appetite, etc., together with the great annoyance caused from an eruption of pruritus about the genitals, which on account of the intolerable itching made life anything but pleasant, and which refused to yield to remedies until the diet had been changed. The menses increased both in quantity and duration but pregnancy did not occur.

Mrs. B., age 27, weight 215 pounds, married seven years, never been pregnant, began treatment one year ago. Moderately restricted diet, eating very little bread or starchy food, exercising in the open air both by walking and the use of the bicycle and the administration of Parke, Davis & Co's desiccated thyroids. The commencing dose was three-fourths of a grain and gradually increased to 6½ grains, three times daily; her weight was reduced to 147 pounds and she is now pregnant; is enjoying good health with the exception of a slight feeling of languor and weakness.

Mrs. R., age 26, weight 200 pounds; inclined to be fleshy from birth, weight 165 pounds when married at 17 years of age; she has gradually increased in weight until three months ago, or for about nine years. The menses at the time of marriage were regular and large in quantity, but have continued to grow less and less until at the present time she is often in doubt as to whether she has passed the monthly period or not, on account of the extreme scantiness and want of color in the menstrual fluid. The treatment was begun about three months ago, with desiccated thyroids, with the advice to eat little bread or food of a starchy nature and take regular exercise by

walking or the use of the bicycle or both. According to her own words she has eaten whatever she pleased and taken only moderate exercise by walking, but has taken the medicine very regularly; commencing dose was $\frac{3}{4}$ of a grain and was gradually increased until at the present time she is taking $5\frac{1}{2}$ grains of the thyroids three times daily, before meals. She has not experienced any discomfort and has lost ten pounds. There is no perceptible change, but she says she can take much more exercise without so much fatigue and shortness of breath as before the treatment was begun.

I could describe a number of other cases that have come under my observation, but think these four cases which I have described will be sufficient to demonstrate the theory that obesity is a frequent cause of amenorrhea and sterility owing to mechanical pressure and the physiologic changes resulting from an excess of fat in the blood tissues, and is amenable to treatment in well selected cases.

WHAT CAN BE DONE BY ELECTRICITY TO AVOID SURGICAL OPERATIONS IN GYNECOLOGY.

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This is a very extensive subject, even when it is narrowed down, as I have done, to the avoidance of surgical operations in the diseases of women; so extensive indeed as to be capable of only a general discussion in the time at my disposal, leaving the detailed proof of the greater comparative value of electricity to other occasions. A number of books have in fact been written on the subject since the publication of my own work and the only purpose that can be subserved in a single paper is to call renewed attention to the subject and to give additional reasons for a faith that needs the fervor of a missionary crusade among practitioners of medicine. That there is need for a pause and self-examination on the true relation of surgery to the diseases of women is the first point to be established, the second question being the claims of electricity as a superior remedy in the treatment of certain affections.

Surgery appeals to the human mind as a brilliant, spectacular and lucrative occupation; it appeals to the professional mind as a means of cutting out an otherwise incurable disease and remedying mechanical faults quickly and in the best manner. As to which of these motives has predominated in the production of the remarkable surgical furore now prevalent among gynecologists, must be decided by those who care to study motives. The evidence of overwhelming interest in surgery by those calling themselves gynecologists is evident on every hand. Beside numerous special institutions exclusively devoted to this work, many of the greatest general hospitals in this country are given over almost entirely to the performance of major operations on the pelvic organs of women, in some of them four or five such operations being done to one equally grave operation in the combined operative fields of men, children and the other parts of woman. Why is this so? It surely can not be that the pelvic organs of woman are so many times more dead, damnable and useless than all other organs of men, women and children.

Without pausing to consider the motives that have resulted in this remarkable activity, or even the insidious steps by which it has gradually grown to be considered by most of us as the legitimate work of prac-

tioners supposed to be engaged in curing the diseases of woman, but little thought is required to show that it is based on a regrettable misconception of the true nature of these affections and of duties as physicians in their remedy.

The uterus and ovaries of woman possess nerves, blood vessels and lymphatics like other organs of the body; are subject to the same vital activities; vulnerable to the same disturbing agencies, whether traumatic, microbic or reflected; and are blessed with the same defensive armament against depressing and morbid influences. Why then should they be treated as so much carpenter work in which the principles of mechanics alone are to be considered?

The stress laid upon displacements of the uterus as a primary lesion, for instance, not only violates the pathologic facts in omitting consideration of older intrinsic changes in the organ itself, which may better explain the symptoms, but is an anachronism in perpetuating a theory of the origin of engorgement or inflammation which has been superseded by the germ theory of disease.

For it is in the germ theory of tissue degradation, coincident with lowered vital resistance, that we have a key to more than half of the pelvic diseases of women, particularly those accompanied by engorgement and proliferation of the parenchyma of the organs and relaxation and fatty degeneration of their supports. The field of electro-therapy in such conditions is an extremely important one, for the true curative agency is one that stimulates the natural defences and rebuilders of tissue—the phagocytes and trophic nerves—to a renewed activity in removing lingering debris and consequences of the germ-phagocytic contest. It is not that electricity does this by virtue of proven germicidal powers at this stage, but rather by a stimulation of vital processes, and in so doing a vast number of otherwise refractory cases may be permanently remedied.

Per contra, it may be asked in what way are propping, stretching, cutting and sewing operations antidotal to the non-suppurative consequences of microbic invasion?

But if pessaries, slitting, stretching and sewing were the worst indignities that modern surgery inflicts upon these organs they would still be left to the curative efforts of the electro-therapist, and many such have finally been restored to health. Unfortunately the pessimism engendered by the failure of these purely mechanical theories of relief has at last produced its fruit in the shape of therapeutic nihilism, which blindly destroys the very organs themselves. Succeeding and accompanying the cyclonic wave of ovarian destruction and removal, we have another wave of uterine removal, the sacrificial operations of this nature attaining proportions at present that stamp Jack the Ripper as a novice in his work. But two criticisms need be made on this latest evidence of the dangers of specialism unaccompanied by judgment: The final conclusion of the surgical gynecologist to destroy an organ for mere enlargement and displacement is without a parallel in any other department of medical or surgical effort, and demands justification on the two-fold ground of the failure of non-destructive methods as well as its own success; secondly, since it has been found necessary to remove the uterus in the same class of cases for which removal of the uterine appendages has been vaunted as a cure-all, what organ or set of organs will next fall under