

noticed that the thumb of the left hand was growing to be like that of the right.

A year ago the patient had a quasi-rheumatic attack affecting the deformed hand and the arm. The pains seemed to run up and down in the arm rather than about the joints. Some months ago she had pneumonia of the right lung, and made a good recovery.

For several months past she has had slight uterine hemorrhages at times, associated with which were dull, aching pains, resembling those formerly felt before menstruation.

In addition, she stated that the swelling had spread up from the knees over the thighs unequally; that the left thigh and buttock had been earlier and more conspicuously enlarged than the corresponding parts on the right side. Gradually, however, the latter became enlarged to an almost equal degree. Later, swelling appeared over the left arm, and later still on the back and sides of the trunk, and, wherever appearing, it gradually became diffuse and finally reached very great proportions. The patient further volunteered the statement that she had formerly been very slight in build.

To ordinary observation she merely presented the appearance of an excessively obese person. However, examination soon revealed that the enlarged tissue was very unevenly distributed. In the region of the knees, where it had first made its appearance, it was excessively irregular and lumpy. To the touch it resembled in a remarkable degree the swollen tissues of Case I. It gave the same nodular feel, and could not be made to pit on pressure. At the time of the examination no tenderness existed in the swellings, but shooting pains were referred to them in various situations. This was particularly the case in the mass over the right hypochondrium. In addition, she complained of scalding sensations on the inside of the right cheek and on the right side of the tongue. Nothing abnormal could be discovered in the mucous membrane of these parts. No tenderness could be discovered in any of the nerve trunks at the time of the examination. The patient was excessively weak, and could move about her bed or sit up only with great difficulty. Her grip was almost nil. No tendon jerks could be elicited, probably because of purely mechanical difficulties. For the same reason an electrical examination could not be made.

Slight diminution of tactile sensibility and of the temperature sense, and also some analgesia, were present. An area of absolute anaesthesia existed on the back of the left arm, extending thence over the posterior aspect of the left shoulder. A marked increase in the swelling had taken place during the last year, measurements showing, for instance, that the left forearm had increased one inch and seven-eighths, and the right forearm one inch and three-eighths; the left arm one and a half, and the right arm two inches. This increase appeared to be maintained throughout.

Subjectively the patient complained much of headache. Her face was very much flushed, and she suffered greatly from cardiac dyspnoea. It was a persistent and distressing symptom. Examination of the eyes proved negative, as did also that of the urine. Perspiration, according to the patient's statement, was scant. Face was not involved in the enlargement; no subnormal temperature; hair thin, but not excessively so; no difficulty in speech; no mental impairment.

The patient remained very much in the same condition for some two weeks following her admission to the nervous wards, when her dyspnoea greatly increased. Her pulse, already soft and compressible, became irregular and intermittent. This condition, though relieved from time to time, persisted until hands and feet became puffy, the face cyanotic, and the lungs oedematous and congested. Death occurred on December 22, 1891.

Autopsy, December 23d.—Body that of a very large woman. Weight estimated at about three hundred pounds. Face dark from venous congestion. Some discoloration on under surface of body and thighs. A number of large white scars on either side over the knees.

Legs and feet oedematous. Body distorted and flattened, as though by its own weight.

Scalp and calvarium revealed nothing abnormal. Veins of dura and longitudinal sinus full. Venous congestion of the pia. Cortex a little darker than normal. Puncta vasculosa prominent. Brain otherwise normal. Spinal cord appeared normal. Skin of thorax appeared normal. The subcutaneous tissue was fatty and moist.

Thyroid gland small, indurated, and infiltrated by careous matter in both lobes.

Right lung oedematous and tightly adherent to chest wall. Left lung oedematous, with hypostatic congestion posteriorly. Both pleural cavities contained a large excess of fluid.

Pericardium contained some six or eight ounces of fluid, in which was suspended some flocculent lymph. Weight of heart, twenty-seven ounces; the right side dilated, the moderator band much thickened; walls of left side also much thickened; marked hypertrophy of the columnæ carneæ and papillary muscles; some fatty change, especially in the walls of the right ventricle.

Over the abdomen the subcutaneous fatty tissue was three inches thick. About a pint of ascitic fluid in abdomen. Stomach much dilated. Intestines normal. Liver showed some fatty infiltration; otherwise normal. Spleen apparently normal, though somewhat dark. Kidneys both revealed, aside from slight adhesions of the capsules, nothing specially abnormal.

In the pelvis an ovarian cyst, containing some six ounces, and a hydrosalpinx were found on the left side. Uterus seemed a trifle larger than normal. Bladder normal.

Brain, cord, some of the nerve trunks, pieces of skin and subcutaneous tissue, pieces of the liver, kidneys and spleen, a fragment of muscle, and the whole of the thyroid gland, were removed for microscopic examination. The specimens were left in the care of Dr. H. W. Cattell, assistant to the pathologist of the hospital. Unfortunately, Dr. Cattell fell ill with scarlet fever, and during his absence the specimens, together with those of Case III., were thrown away by an attendant.

CASE III.—M. M.—, aged sixty years, widow, a tailor by occupation, and a native of Germany, but a resident of America for twenty-six years, was admitted to the nervous wards of the Philadelphia Hospital, October 7, 1891. Memory very poor. History obtained in part from relatives.

Her father and mother healthy, though her mother died of heart disease. She had seven brothers and sisters, all apparently well. She had no children; had never been pregnant.

Many years ago a lump appeared at the back of the neck, for which she consulted Dr. Gross at the Jefferson Medical College, but for some reason no operation was performed. At various times thereafter swellings made their appearance in various situations. Further, she lost more blood at her menstrual periods than normal. Occasionally she suffered from hæmatemesis and epistaxis. The climacteric occurred at forty-six. No history of any intercurrent affections. Mental impairment had been noticed for about two years.

On examination the patient was found to be excessively feeble. For some two weeks she had been unable to walk. She lay, for the most part, in a quiet, apathetic state, though when aroused she answered questions slowly, but intelligently. She was also somewhat deaf.

Examination further revealed soft, fat-like masses or swellings in various situations. Thus, a large, soft mass was found over either biceps, and others, somewhat smaller, over the outer and posterior aspect of either upper arm. Two large masses were found over the belly, separated above the umbilicus by a deep, transverse crease. Another gave excessive prominence to the mons Veneris. From the back of the neck, at its lower part, sprang a big mass like a hump, while a diffuse swelling gave a cushion-like coating to either half of the back, and extensive deposits gave unnatural prominence to either hip. In marked contrast, the deposit was

absent from the forearms and hands, from the face, from the thighs and legs, and from the buttocks. The gluteal regions, in fact, seemed flattened and sloping.

The deposit over the back seemed tolerably firm and resistant; over other portions it was quite soft, though

not been sweating freely for years, but owing to her mental condition no importance was given to this statement. She at no time presented any change in temperature. Her hair was well preserved.

The patient seemed to fail slowly and steadily, although liberal diet and stimulants were freely used. Her dementia gradually deepened, and for some days before death she voided urine and faeces involuntarily. She finally died in a comatose state on November 5, 1891.

Autopsy, November 6th.—

Body that of a large woman with irregularly distributed fat-like masses. Some discolorations on the back. Small bed-sores beginning on the buttocks.

Scalp and calvarium normal. Dura normal. Pia very oedematous. Brain very soft and oedematous. Cord revealed nothing abnormal.

On incising the skin of the chest and abdomen it was found to be normal in appearance, but the subcutaneous tissue, which looked like very white fat, was excessively

thick, attaining below the umbilicus a depth of seven inches.

The thyroid gland was larger than normal, harder to the feel, and much calcified, especially the right lobe.

The heart weighed eight and a half ounces. Both aortic and mitral valves were slightly thickened. Heart substance evidently fatty. Lungs emphysematous.

The mucous membrane of the stomach revealed a chronic gastritis. The liver weighed forty-four ounces, and, beyond some fatty infiltration, was practically normal. Spleen normal. The kidneys, however, showed decided shrinking and loss of cortical substance, with

elastic, and exhibited the same nodular feel noted in the previous cases. Further, it was discovered at once that these masses were painful to the touch, the patient complaining very much when only moderate pressure was exercised. This was especially true of the deposits over the arms and back of the neck. In addition, the patient complained of stabbing pains in the deposits, more marked in the regions just mentioned. There was no tenderness over the nerve trunks. She complained also of headache.

When the examination was made it was also further noted that the left radius was rough and nodular for about

two and a half inches in its middle third; also, that there was a large discolored area on the outer aspect of the left forearm resembling a syphilitic scar. Both tibiae were somewhat nodular, though no scars were discovered on the legs. A few white scars were seen on the forehead. Finally, quite a number of purpuric spots were observed on the forearms, thighs, legs, and back.

The skin of the forearms and hands, as well as that of the legs and feet to a less extent, was dry, dark, and much roughened.

Cutaneous sensibility was found to be generally diminished, while a few patches of anaesthesia were noted. One of these was an area diffused over the right side of the trunk and the right shoulder. These areas of anaesthesia appeared to be constant, and were confirmed at various examinations.

Owing to the extreme weakness of the patient, the study of the eyes could not be made satisfactorily, but, so far as it went, it was negative. The urine contained albumin, though no casts were found.

In answer to questions the patient said that she had

somewhat adherent capsules. Nothing noteworthy was seen in the pelvic organs.

As in Case II., brain, cord, nerve trunks, skin and subcutaneous tissue, thyroid gland, and portions of other viscera were removed for microscopic examination, but, as already mentioned, the specimens were subsequently lost.

It was not without some hesitation that these cases were presented together. The writer was well aware that without a microscopic examination to supplement

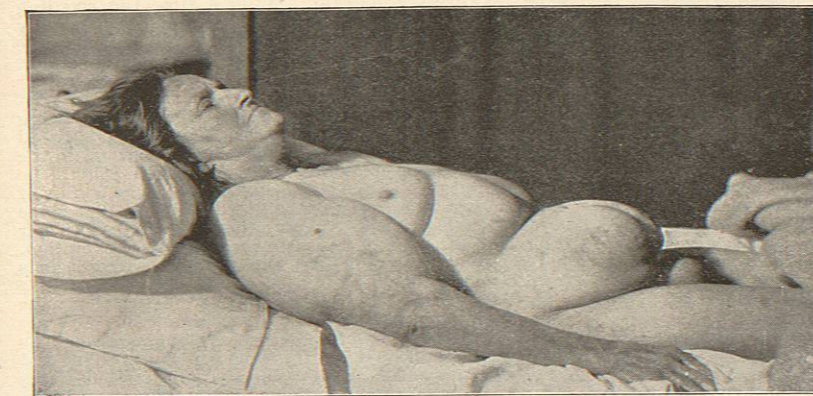


FIG. 46.—Author's Third Case.



FIG. 47.—Rear View of Author's Third Case.

the autopsies their study was incomplete, and yet the cases are in themselves so interesting, and appear to be so unusual, that their publication in a group, with such data as are at hand, seemed to him to be more than warranted. Case I. had originally been published in the *University Medical Magazine* for December, 1888, under the title, "A Subcutaneous Connective-Tissue Dystrophy of the Arms and Back, Associated with Symptoms Resembling Myxœdema." Case II. had been discovered in the medical wards of the Philadelphia Hospital by Dr. Frederick P. Henry, in 1890, and was published by him in the *Journal of Nervous and Mental Diseases* for March, 1891, as a "Case of Myxœdematoid Dystrophy." Dr. Henry fully recognized the relation existing between this case and that previously described by the writer, and he adopted the term dystrophy in order to bring the cases "into the same category." In November, 1891, this case (Case II.) having been transferred to the nervous wards of the Philadelphia Hospital, came under the care of the writer and was studied again. The account here given is abstracted partly from the notes of Dr. Henry, and partly from those of the writer.

Case III. was discovered in the nervous wards in October, 1891.

Certainly these cases differ radically from ordinary cases of lipomatosis, and certainly the nervous symptoms present must have a special significance. To begin, the enlarged tissue makes its appearance in a very irregular way. Nodules of soft tissue are at first deposited in some one situation, or perhaps in corresponding places in both arms or in both legs. For a time the deposit is limited to these original areas, but subsequently it makes its appearance elsewhere, and may become very extensive. Regions, however, may exist which remain permanently uninvaded. In Case I. the enlargement was first noticed in both upper arms, and later in the back. Subsequently a swelling made its appearance on the inner aspect of the right knee, to be followed months after by a similar swelling in a corresponding position over the left knee. Later still, swellings made their appearance in various other situations. However, the legs, with the exception of the knees, have remained free from involvement, while the thighs and buttocks have only recently shown a doubtful change. In Case II. the enlargement began on the inner aspect of either knee, and then gradually spread unequally over the thighs and buttocks. Later, the left arm became involved; next, the sides and back, and, finally, the entire trunk. In Case III. the enlargement began in the back of the neck, and then at various times appeared in other situations. It remained absent from the face, the forearms, the legs, the thighs, and the buttocks. It is a peculiarity of this case, also, that the enlargement tended to produce distinct segregated masses.

Not only is the development of the enlargement irregular and even capricious in these cases, but there is, in addition, another important fact to be remembered, and that is: that at some time or other the enlargement is accompanied by pain or other nervous symptom. Thus in Case II. pain, shooting in character, and a sensation of coldness preceded the appearance of the nodules on the insides of the knees. In Case I. shooting and burning pains made their appearance about a year after the swelling had appeared in the arms, while similar pains, very great in intensity, preceded the appearance of the swelling on the inner aspect of the right knee and in other situations. Case I. it should be remembered, was observed by the writer for a number of years, and was therefore studied in great detail, and pain was noted as a marked feature of the case, especially in the early course of the disease. Occasionally it was observed in old areas of enlargement, and again in regions free from the swelling, but in which the latter subsequently appeared. In Case III. stabbing pains were complained of and were referred to the deposits, and the latter were very painful to examination.

We may say, therefore, that pains, shooting, burning,

or stabbing in character, were present in all cases at various times in their history.

Some of the paroxysms observed in Case I. were particularly suggestive. Sometimes a welt-like swelling suddenly made its appearance, evidently following the course of a cutaneous nerve trunk and at the same time being exquisitely painful. After a time the swelling would become slightly less, but would never wholly disappear. Several such "welts" are still demonstrable in Case I. If the paroxysm of pain made its appearance in an area of old enlargement, that is, reappeared or recurred, a decided and sudden increase would take part in the swelling, and it would become for the time being firmer and more resistant and occasionally more nodulated than before, and generally a permanent increase in the swelling could be demonstrated. Further, it should be remembered that at one time some of the nerve trunks of the right arm were very sensitive to pressure, that some of the muscles, those of the thenar and hypothenar groups of either hand, revealed reaction of degeneration, and finally that the patient suffered on two occasions from herpes zoster.

In Cases II. and III. tenderness over the nerve trunks was not present at the time of the examination. In Case I., however, this symptom is also no longer present, its absence having been noted for some time past. This and other circumstances justify the assumption that Cases II. and III. were further advanced than Case I., and that the latter was really observed during a developmental period and while more active changes were going on.

Among the nervous symptoms must also be placed the diminished cutaneous sensibility and the patches of anesthesia as well as perhaps the excessive weakness. It is probable also that the absence and the diminution of sweating belong to this category. It will be remembered that this symptom was undoubtedly present in Cases I. and II. and doubtfully in Case III. Lastly, headache was noted in all the cases.

Among other symptoms present in these cases should be noted hæmatemesis in Case I., hæmatemesis and epistaxis in Case III., and a recurrence of uterine flow many years after the cessation of menstruation in Case II. In Cases I. and II. the menopause occurred unusually early, namely, at thirty-five, and in Case II. menstruation was unusually free. In Case III. the menopause occurred at forty-six, and menstruation was likewise said to have been excessive. Finally, Case III. presented a well-marked purpura. What significance these symptoms may have, it is impossible to say. It may not, however, be out of place to recall the not infrequent occurrence of uterine hemorrhages in women who subsequently suffer from myxœdema.

Bronchitis was a most frequent and persistent symptom in Case I., while both Case I. and Case II. suffered markedly from cardiac dyspnoea. But these symptoms were absent in Case III.

The fact that in both cases the thyroid gland was found indurated and much infiltrated by calcareous deposit is not only very interesting but exceedingly suggestive. Without microscopic studies, however, and without a more extended series of cases it is impossible to draw a conclusion. The part, if any, played by the thyroid in this curious affection can be determined only by future autopsies. It goes without saying, also, that the thyroid should be studied in every case of obesity, whether typical or otherwise, that reaches the post-mortem table.

With the above data before us, it is impossible to classify these cases under any well-established disease. Evidently the affection is not simple obesity. If so, how are we to dispose of the nervous elements present? It is equally certain that we have not myxœdema to deal with. All of these cases lack the peculiar physiognomy, the spade-like hands, the infiltrated skin, the peculiar slowing of speech, and the host of other symptoms found in myxœdema. It would seem, then, that we have here to deal with a connective-tissue dystrophy, a fatty metamorphosis of various stages of completeness, occurring in separate regions, or at best unevenly distributed and

associated with symptoms suggestive of an irregular and fugitive irritation of the nerve trunks—possibly a neuritis. This, however, does not embrace the whole truth, and it remains for future research to determine to what this neuritis is due, whether it is a cause of the fatty metamorphosis or only concomitant, and whether the thyroid gland does not play some mysterious part in its causation.

Inasmuch as fatty swelling and pain are the two most prominent features of the disease, the writer has proposed for it the name *adipositis* dolorosa*.

Since the above was written, three cases of *adipositis dolorosa* agreeing in all essential details with the cases described by the writer have been reported by Spiller.† Two cases have been placed on record by Eshner.‡ Another has been reported by Guidiceandrea;§ and the case described by Ewald, in discussing the treatment of myxœdema, cretinism, obesity, etc., by thyroid extract, of a man who presented thick masses of fat about the nipples, the umbilicus, and the neck, with pains resembling those of neuritis, was doubtless an instance of this affection. Collins,|| Peterson, and Loveland have also studied cases. Francis X. Dercum.

ADIPOSITAS.—(Synonyms: *Corpulence, Obesity, Polysarcia.* Cœlius Aurelianus and other of the older writers reserved the term *polysarcia* for extreme cases of the disease, but the terms are now used indifferently.)

DEFINITION.—*Adipositas* is a disorder of nutrition characterized by the deposition of an excessive amount of fat in many parts of the body.

The close relation which certain forms of *adipositas* bear to constitutional diseases, such as gout, arterio-sclerosis, and lipogenous diabetes, leads Krehl to place them in the same group.

It is frequently difficult to decide when the limits of normal stoutness are passed and the condition becomes pathological.

The amount of fat in a healthy adult is about one-twentieth of the body weight in the male and about one-sixteenth in the female (d'Heilly).

When the amount of fat is productive of symptoms, such as palpitation or breathlessness on slight exertion, difficulty in walking, or disinclination to take exercise, the diagnosis of obesity is justified, even if an equal amount of fat is borne without discomfort by another person. The possession of a considerable amount of adipose tissue is of value in health. As it is a poor conductor it diminishes the amount of heat lost; and it represents a reserve capital to be drawn on in time of need, thus diminishing the drain on the tissue proteids.

The increase of bulk in obesity renders all bodily movements more and more difficult, and the increase in weight calls for the expenditure of more muscular energy. The muscles tire sooner, and there is a tendency to refrain from all avoidable movements. Disuse of the muscles is followed by atrophy; the disproportion between body weight and muscular power increases, and thus a vicious circle is established.

It is not rare to find corpulent subjects weighing three hundred pounds. Cases weighing four hundred and fifty pounds are frequent in the literature. These examples of monstrous obesity are more common among the English, Dutch, and Germans than among the French. The famous Daniel Lambert weighed seven hundred and thirty-nine pounds at the age of thirty-nine. There was a colored woman living near Baltimore who weighed eight hundred and fifty pounds. According to the *Med-*

ical Record, there was a man in North Carolina of gigantic frame who weighed over one thousand pounds.

At the Boston City Hospital there have been seven cases of marked obesity among the last thousand autopsies, one subject weighing over four hundred pounds.

ETIOLOGY.—*Hereditary.*—There is a hereditary tendency to obesity in about fifty per cent. of the cases. It is more frequently present in women than in men, but the disease may attack every member of a family. It usually does not appear till after the age of twenty or even later.

Similarly among domestic animals, particularly swine, there are certain breeds which are especially adapted for fattening. In all these cases there must be a special predisposition which leads to the deposition of fat under circumstances in which in a normal organism no fat would be formed.

Cohnheim believes that the oxidation of fat is abnormally low in these individuals, due to a reduction in the functional power of the tissue cells.

Age.—Corpulence is not uncommon in childhood, especially in America. It may occur even in infancy. Barkhausen reports the case of a male child, aged sixteen months, who weighed fifty-three pounds. Williams cited, many years ago, the case of a child who weighed one hundred pounds when one year old. Regnelle observed a child of eleven years who weighed four hundred and fifty pounds. Sometimes the abnormal stoutness is lost during adolescence. The least production of fat occurs between fifteen and twenty years of age. Obesity most commonly develops in the fourth and fifth decade. The fat is lost in old age. It is very rare among octogenarians and never is present in nonogenarians (Thompson).

The distribution of fat varies with the age. In the newborn the omentum and mesentery contain no fat even when there is a large formation elsewhere. So long as the growth in height continues these structures remain nearly free from fat. During middle life a large amount is deposited in the internal organs, and in old age it persists there after it has largely disappeared from the subcutaneous tissues (Oertel).

Sex.—*Adipositas* is more common in women than in men. Of one hundred and eleven cases collected by Bouchard seventy-five were in females. The hereditary form frequently manifests itself after the first pregnancy.

Over-feeding and over-drinking are the most potent factors in the production of obesity. As Osler well says, "the majority of people over forty years of age habitually eat too much," and, we might add, exercise too little.

Alcohol plays an important etiological rôle. In those countries in which the consumption of beer is greatest obesity is most common. Apart from the alcohol in the beer, the great quantity of fluid consumed, and the large amount of carbohydrates, more than five per cent., tend to fat production. Alcohol is readily oxidized, and thus saves the body fat from combustion; and it probably exerts a direct injury upon the cells, thereby diminishing their metabolic power.

Castration or sexual inactivity favors the deposit of fat. After the menopause there is a tendency for women to grow stout. Tilt found that of two hundred and eighty-two women examined, over forty per cent. became obese within five years after cessation of menstruation.

Anæmia.—After hemorrhage, and in chlorosis and other anæmias, there is often a rapid increase of fat. This is explained by the diminished oxidizing power of the blood, brought about by the loss of hemoglobin, which is the oxygen carrier.

There are certain racial peculiarities worthy of note. Among the Hottentots there is a great accumulation of fat in the gluteal region. This is esteemed a mark of beauty. The Hebrews are especially prone to obesity. Climate and season exert little, if any, influence except as may be explained by habits and diet.

PATHOLOGY.—Fat can be formed from proteids and carbohydrates, or it can be directly stored up from the fat contained in the ingested food. The proteids are split into a nitrogenous and a non-nitrogenous portion. The

* *Adipositis*, as is well known, would be etymologically more correct if it were written *adipositas*, but *adipositis* has been so long in use that it must be regarded as established. *Adipositis dolorosa* has also perhaps a less formidable sound than has its Greek equivalent *lipomatosis algera*.

† Spiller: *Med. News*, February 26, 1898, p. 268.
‡ Eshner: *Journ. Amer. Med. Assn.*, November 12, 1898, p. 1156.
§ Guidiceandrea: *Soc. Lancisiana degli Ospedali di Roma* 1^e Juillet, 1899; also *Revue Neurologique*, December 15, 1899, p. 877.
|| *Nervous Diseases by American Authors*, Dercum, Philadelphia, 1896, p. 838.