Observations on fatty heart : comprising remarks on the morbid anatomy, symptoms and diagnosis, prognosis etiology and treatment, an essay / by Henry Kennedy.

OBSERVATIONS

ON

FATTY HEART

H. KENNEDY

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COMPRISING

REMARKS ON THE MORBID ANATOMY,
SYMPTOMS AND DIAGNOSIS,
PROGNOSIS, ETIOLOGY, AND TREATMENT.

AN ESSAY,

BY

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TO

MY COLLEAGUES IN SIMPSON'S HOSPITAL,

DRS. DUNCAN, BIGGAR, AND MR. PORTER,

THIS ESSAY IS INSCRIBED,

WITH EVERY FEELING OF RESPECT,

BY

THE AUTHOR.

PREFACE.

THE subject of the following Essay has engaged my attention for many years. It was originally brought under my notice by the very sudden death of a gentleman in whom one of the forms of fatty heart was found. Since that event I have been in the habit of noting down most of what came under my notice having any connexion with the subject. In this way I have collected some material which I believe worthy the notice of the profession. Part of this has already appeared in the shape of papers and communications published in *The Dublin Medical Journal*, *The Medical Press and Circular*, *The Edinburgh Monthly Journal*, and by translation in the *Archives Générales*, *Ranking*, and elsewhere. My present object is to collect the substance of these papers into one, and also add whatever additional facts and experience I may have acquired,

It may not be irrelevant to state that my appointment to Simpson's Hospital has afforded me a field of which I have gladly availed myself. In that noble Charity above 70 old men are well cared; and, as gout is one of the two diseases for which alone they are admissible, the reader will at once understand why I specially refer to it. On the other hand, I would have it distinctly understood that the following Essay is anything but complete. Some forms of fatty disease have not been noticed at all; again, I have only spoken of so much of the morbid anatomy as enabled me to explain my own views; and, lastly, I have merely glanced at what may be called the complications of fatty disease. What I do hope to accomplish here is to add something to the general stock of information on a disease which, in importance, I believe to be behind none other in practical medicine.

H. K.

DUBLIN, *January, 1880.*

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CHAPTER I.

THE MORBID ANATOMY.

If the question were asked—In what branch of medicine has the greatest advance been made during the last quarter of a century? the answer, it seems to me, would be—In the study of morbid anatomy, taking the terms in their widest meaning. The number of works of a general character relating to this subject has been very great, to say nothing of those which treat separately of the several organs of the body, and in which the morbid anatomy of the organ is given with the most elaborate detail. The Pathological Societies (of which that of Dublin, it ought ever to be remembered, was the first) have also contributed largely in extending our knowledge on this matter; and the profession generally may now be said to be in possession of information of the greatest value, which without those Societies could not by any possibility have been otherwise attained.

Amongst the special subjects of study of this branch that of fatty disease has received a large share of attention, and it may, indeed, be said that in no other

have such great advances been made as in this one, for all the investigations of late years go to prove that fatty disease or degeneration may play a most important *rôle* in every organ and texture of our frames; nor is it going too far to state that such has been found by the microscope to exist. But to enter into such a wide-spread disease here would far exceed my present limits, and I shall therefore confine myself to those parts only which seem to me to have a direct bearing on the subject of this essay. Before doing so I would make one remark which, though very obvious, must here be made—I allude to the contrast which exists between fatty disease of whatever form, and any other which affects our frames. In the results of inflammation of any kind, in the effects of the strumous diathesis, or malignant disease, there are products poured out which are foreign to our frames; but in fatty disease it is not so, and, no matter what organ or part is attacked, it is still only a component part of our healthy frames which causes this, and without some of which, it may even be said, life would not go on. In considering our subject this is a point which we must not lose sight of.

In the following sketch of the morbid anatomy of fatty disease I shall speak only of so much of it as will answer my present purpose; but I will avail myself of the ordinary divisions to be found in all the works relating to the subject.

The two great divisions are known as "Fatty Growth" and "Fatty Degeneration." The first of these must again be divided into the general state, affecting more or less the entire frame, and which is known as obesity,

and the second as the same condition, confined to the heart alone.

It is familiar to all that at and after middle life a number of persons are liable to get stouter than they had previously been—in other words, fat begins to be deposited in different parts of the frame, and the individual will weigh more than he did in earlier life. It would seem as if this tendency were more common in men than women, though the latter are by no means exempt from it, and more particularly after the cessation of the menses. But this tendency to grow fat, though general in its way, presents some points which are well worthy of observation; and as I consider they have not been sufficiently noticed, and have besides a direct bearing on my subject, I would call attention to them here. Thus, while the tendency shows itself over the whole frame, still, on closer observation, it will be found that the fat deposits itself much more in one region than another. In one it will be the thorax and arms, in another the abdomen, and in either it may be the parietes separately or the internal organs. I have often seen the parietes but slightly fatty, whilst the internal parts were literally loaded; and, *vice versâ*, the parietes have exhibited much fatty deposit, and the internal parts very much less. This point has been described by others. "The omentum alone," says Chambers, "may be loaded with fat;" and in Quain's celebrated paper—one to which I shall often have to refer—I find the following expressions used: "Body very fat, limbs less so;" "omentum loaded with fat;" "abdomen fat," and so on; and in numerous instances on record it

is expressly stated that, on examining the body, fat was found in places and in quantities which had never been suspected during life. But though these observations have been made by Quain and others, the deductions which follow from them have not. These, however, must be reserved for another part of this essay.

It is worth noting that this tendency to deposit fat in particular regions is not confined to man. It may be observed in some of the lower animals, as in cows and sheep. In the abdomen, and more particularly about the kidneys, it is very common. In prize animals it is very striking, and in cows large masses of fat may also be seen close to the spine and tail. It is also worth stating that this very same state exists in animals where it cannot in any sense be considered abnormal—I mean in those creatures that hibernate; and, as bearing particularly on the point of which I am speaking, some of these store up the fat in the omentum, whilst others store it in the abdominal parietes. It is stated, too, that in some animals the thymus gland becomes greatly enlarged towards winter. In the whale the fat or blubber is said to be entirely subcutaneous. It thus bears out the remark that some states of disease amongst human beings are but normal conditions in the lower animals, and so it is of the fatty growth of which I am now speaking; and, in alluding to it on the surface of the body, I believe I am correct in stating that the great majority of tumours which grow there are fatty, whilst in females the mammæ become not infrequently the seat of fatty deposit which amounts to disease—of which Dr. MacSwiney exhibited a marked example some time back.

Amongst those parts of our frames which exhibit the fatty change, in what must be called a general way, the blood-vessels, and more especially the smaller arteries, must not be overlooked. Atheroma is but another name for this state, which is now known to affect the vessels of all the organs of the body, and, there can be no doubt, plays a most important part in their diseases, whether of the brain, chest, or abdomen. I stop not here to inquire as to the exact site of the deposit. It is enough for my purpose to state that when it exists it must seriously interfere with the functions of the vessels—in proportion, of course, with the amount of deposit present.

In close connexion with fatty disease of the arteries, I must notice here a growth of another kind which is of frequent occurrence, and has a very important bearing on my subject—I mean bony deposit, which so often co-exists with fatty disease. Farther on I shall have to speak specially of this union. Here one remark will suffice. The bony growth is very generally, I believe, secondary to the fatty deposit. The two, I take it, do not form at the same time. Atheroma may often be met *per se;* but I have rarely seen bony deposit in the arteries that there was not clear evidence of its having been preceded by fatty deposit when the latter also existed. This sequence seems to me very important to keep in mind, but the reasons will come in much better in another place.

That the brain, spinal marrow, and nerves are very liable to be affected with fatty disease is well established. We know that these structures in the healthy state

contain a considerable amount of fat—the brain, however, having less than the nerves. Into the particulars of the changes produced by fatty disease in these organs I need not here enter further than to state that, whether they be hardened or softened, fatty matter or granules are found to exist in greater quantity than usual, and very frequently supplant the healthy nerve-tubes. What is of very much more consequence to recognise is the fact that these morbid changes may occur with great rapidity. Waller seems to have been amongst the very first to have ascertained this, and has shown that when a nerve is cut the distal end degenerates very rapidly—in fact, within ten days, exhibiting at the same time fatty changes; and this shows us the possibility of a similar change rapidly occurring even in nerves where no injury was present which might set the process going. No other explanation, it seems to me, will account for a fact which has often come under my notice—I mean the great difference in the course and duration of cases which are known as examples of the diathesis. Some have run a very rapid course—from the first complaint till the death of the patient not occupying more than a year—whilst others have been ill many years. What, in fact, occurs in other diseases is also seen here, and it is a point well worth keeping in mind, for the common impression is that fatty change is a very chronic one—and so it usually is, but it presents many exceptions. When I come to speak of the natural history of the affection this part of my subject will again be brought under notice.

I would now speak of a stage of the disease, as it

affects the nervous structures, and in direct connexion with fatty change, which appears to me of much moment to recognise—I mean where effusion occurs which, in most cases, at least, is serous. This state all the experimenters on the nervous system and its functions have described, and with it the morbid anatomist is quite familiar. Rokitansky, Waller, Mitchel, and others have spoken of it as affecting the nerves when injured; whilst in special nerves, such as the sciatic, the same state has been found, as also in the nerves of insane persons* afflicted with general paralysis. When it affects the brain we know it as the wet brain, and find it often joined with serous effusion on the surface of the organ; and so also of the spinal cord, though not so commonly in the latter as the former. It is not, however, of the state itself I would here speak, but of its relation to the fatty diathesis. I believe when this state exists or commences it is sure, sooner or later, to be attended by the effusion of serum into the nervous structures of which I have been speaking, and, further, that this very state plays a most important part in many of the symptoms which these cases present—in fact, that they stand to each other as cause and effect. Now this, I repeat, seems to me a most important view to take of the subject, because most writers have entirely ignored it. They all describe it, but not in the relation to which it seems to me to be entitled. But, further than

* Lewis states that in the paralysis of the insane the sciatic nerves were found degenerated, funiculi lessened, general diffused atrophy, sclerosis of capillaries, and general fatty degeneration.—*West Riding Reports.* Vol. V., p. 85.

this, some writers, amongst whom I must specially mention Wilks, have gone so far as to state boldly that this state is of no moment one way or other—in fact, that it is not a condition capable of causing direct symptoms. In this statement I cannot for a moment concur, and would go even so far as to express my surprise how it has ever been entertained. When the stage of serous effusion affects the nervous structures, we know it is secondary to other important changes in that system; and to suppose it can exist, and at the same time not cause symptoms of its presence, is surely going further than any known facts will justify.* At any rate, such an idea is directly opposed to any knowledge of morbid anatomy I myself possess, as well as such experience as I have had—in truth, the state is one which I believe can be easily recognised during life, and which I have often confirmed after death. It explains, too, better than any other view of the subject with which I am acquainted, most if not all of the symptoms present during life. Anyone who has watched cases of the kind of which I am now speaking—I mean cases of the fatty diathesis—cannot fail to have noticed the way in which the symptoms vary from day to day. This is not the place to describe these; but, as I am anxious to make myself clearly understood, I may here allude generally to all those symptoms which come under the head "emotional"—such as laughing, crying, stammering, the different forms of temporary paralysis, &c. One and

* "The state and functions of the brain," says Thudicum, "are each modified by the amount of serum present." This is directly denied by Wilks.

all of these will be observed to be most transitory, coming and going in the most irregular way—the state, in truth, might be described as one of "unstable equilibrium," so intermitting are the symptoms. But this part of my subject will have to be considered again.

Allusion has been already made to certain nerves, both from injury and disease, exhibiting changes in which fatty deposit plays a very important part, and it admits of no doubt that the advancing knowledge of the day has opened up to us new views on this subject, and shown us that all the nervous textures of the body, including the ganglionic and sympathetic systems, are in turn liable to disease, and with a frequency which has only lately transpired; and that fatty degeneration, as already stated, forms an important part of this change is certain. Walshe states that "fatty metamorphosis of voluntary muscle is accompanied by accumulation of oil within the neurilemma of its supplying nerves, but," he goes on to state, "whether the nervous structure of the heart undergoes a similar change is imperfectly known." Again, Mitchel states, and it had been previously noticed by Rokitansky, that "the effect of neuritis is to soften the nerve, partly due to hyperplasia and partly to serous effusion within the main sheath and between the nerve-fibres." These are general statements, but there are also special facts which have a more direct bearing on my subject. Thus, Professor Masoin of Louvain, has found that the right par vagum has much the greatest power over the slackening and suspending power of the heart. With such a fact before us, is it going too fast to conclude that in those cases

of fatty heart which are marked by slow pulse the cause lies, not in the heart itself or the diaphragm, but in some diseased state of the nerves themselves—most probably a fatty state? This idea can only be taken at present for what it is worth, but it seems to me very plausible. In connexion with this part of the subject I may also allude to a recent author, Loomis, who states that "disease of the cardiac ganglia and nerves may lead to fatty heart." Other writers, it is more than probable, could be found who would confirm these views as to the direct connexion between fatty disease of the nervous cords themselves and the organs they supply.* But enough has been advanced for my present purpose, as bearing directly on the heart when fatty disease attacks it, and about which it is the more immediate object of this essay to speak.

One other remark in connexion with disease of the nerves may be made here. It is very obvious that if the nerves supplying any particular organ—as, for instance, the heart—become diseased, a similar occurrence may in all probability occur in other organs, as the liver, kidneys, &c. Even when disease of this kind attacks the sciatic nerve it is known that it does not

* It is stated by Quain—and the statement seems to me a very important one—that when fatty degeneration, by artificial means, is produced, the nerves and blood-vessels participate in the change. He gives two instances of this kind, and says:—"From these observations I conclude that, whatever be the nature of the process, the places of the muscular fibres, the blood-vessels, and nerves, are occupied by fatty matter which could not have existed in them during life." Rokitansky, I find, believes that fatty degeneration depends on an impairment of the nervous power of the heart.

exhibit itself continuously, but only in patches—that is, with healthy nerve intervening; and so it may be, I believe, when the disease is more general. One set of nerves, or a portion of them only, may be attacked, leaving others quite free. Hence, we may have the liver and its nerves diseased *per se*, or the kidneys. Why there should be such selections it is impossible to explain, but of the fact itself there can be no reasonable doubt.

A very few words will suffice in speaking of fatty change in the voluntary muscles. It is known that want of exercise, no matter from what cause, will surely be followed by this state—a very important fact as bearing on other parts than the voluntary muscles. This state, too, has sometimes been observed under circumstances that must be called constitutional, as the highly interesting paper of Dr. Meryon, of London, amply proves, and in young subjects too. It is specially worthy of note that in the cases given the heart itself was found healthy. It is also to be noted that it was the boys were attacked, whilst the girls of the same family escaped. For further details of fatty change, as it occurs in the voluntary muscles of the young, I must refer to the paper itself. Adults, however, we must remember, are also subject to this change, but when it occurs in them it very generally, if not always, goes hand in hand with fatty change in the heart. The best illustration we have of this is what may be observed in many, if not all, who are given to strong drink, and who die while still young. I had been often struck, in examining these bodies, with the changes which I

observed in the external muscles of the thorax—long, indeed, before I was aware of its importance or its very close connexion with the subject now being discussed. There was no difficulty in detecting in some such cases, even with the naked eye, the signs of fatty change; nor have I now the slightest doubt that if sought for by the microscope these changes would be found more commonly than is usually thought. In some sets of muscles—as, for instance, the abdominal—these changes may cause symptoms which are very important to recognise, and of which I shall speak again; whilst in those of the lower extremities the results are often seen in diminished powers of walking, leading to what may be called semi-paralysis. When fatty change attacks the voluntary muscles, it has been observed by Hallett that the change begins at the outside, and then spreads inwardly; and this also applies to the flat muscles.*

The diaphragm is known to be liable to fatty degeneration; and from its functions and very close connexion with the heart, it is a part which occupies an important place in the subject. It is, I believe, quite possible to arrive during life at an accurate diagnosis of the state of this muscle, and it is clearly always expedient to do so. Fatty change of the heart and of

* In connexion with fatty disease of the voluntary muscles I may allude to the appearances which prize beef exhibits; and I believe it pervades every muscle of the animal—the streaking being, of course, due to fatty deposit. I may also notice two other creatures in which fatty deposit is common—pet dogs and canary birds. Of the latter I have seen two instances where they were affected with fits of syncope, and were seen to fall off their perch as if they were shot; from this state they quickly recovered.

this part are frequently co-existent; and one writer, Callender,* as quoted by Walshe, states "that if the diaphragm be fatty the heart is so too." Whilst admitting the fact that they frequently go hand in hand, it seems going too far to assert it is always so. In a case brought forward by Dr. Head it certainly was not so, for, whilst the diaphragm was extensively fatty, the heart was free of that change.

It is scarcely necessary here to do more than allude to the fact that the intercostal muscles are very liable to fatty change; but it is always well to keep in mind such an occurrence.

One organ, having a special relation with the subject, calls for some notice here—I mean the liver. That it is frequently fatty and co-exists with the same state of the heart is certain. Quain speaks of this, and, in a much more striking way, Ogle, who states that out of 100 cases of fatty heart the liver was found in a similar state in 68—that is, more than two-thirds of the entire number. Whether this state precedes that of the heart has not been determined; and yet, in a diagnostic point of view, it would be very important to ascertain. On the other hand, it is not to be overlooked that fatty liver often exists *per se*. On different occasions I have seen this; and Louis, it will be recollected, has drawn attention to the fact that fatty liver often co-exists with phthisis. It seems to me that this union must be more common in France than with us; within my own experience it has been very exceptional.

In speaking of fatty disease of the heart it will be

* This gentleman died very recently, on his way from America.

necessary to describe it under two forms—the first being "fatty growth," and the second "fatty degeneration." Both these forms have been often described, and by different authors. But it seems to me the subject can be looked at in a different point of view from anything yet given in books, and more particularly the state I have called "fatty growth." This consists, as we know, simply in the deposit of an abnormal amount of fat on the heart, usually occupying the base of the organ and the right side. It is by far the most frequent form of fatty disease of the heart; and what is very important is the fact that the diagnosis of this state can, I believe, be always made. Assuming that the healthy heart of an adult man weighs nine ounces, under the circumstances of which I am now speaking it usually weighs at least twelve, and between that and fifteen ounces is very common.* It is by no means easy to determine whether, in this state, the muscular structure of the heart ever becomes hypertrophied, but it seems to me to take on increased action; nor is this to be wondered at, for it would be strange indeed if, with an addition of from three to six ounces of fat placed on the organ, it would continue to carry on the same degree of action as in the normal state. Such an idea cannot be entertained, and all the experience I have had goes to support this view. One symptom only would I mention now in connexion with this point, which has reference

* No very large heart in this state of fatty growth has come under my notice; one weighing 18 ounces is the largest I have seen. In the 83 cases given by Quain the heart is described as being increased in 43—that is, about one-half.

to the pulse. As a consequence of the state of the heart described the pulse becomes full and bounding, even when the individual is in comparative health. Whether this state is added to by any hypertrophy of the muscle I will not take on me to determine, but in some cases I have met it seemed very probable. Now this state of pulse, and in connexion with fatty growth on the heart, has not, as far as I am aware, been described by any writer. It is neither noticed by Quain, Hayden, nor Walshe—and I mention these authors as having given the most elaborate details on the subject—and yet it is one of much frequency and easy recognition. When I come to speak of the diagnosis there will be occasion to revert to this point again.

How long fatty growth on the heart—using these words in their strictest sense—continues as such it would be hard to determine. But we know that the state changes in time; fat is deposited between the muscular fibres, and finally takes the place of these fibres themselves. In this way fatty degeneration, as distinguished from fatty growth, comes to be formed, and the two states co-exist; and these it is most important to keep clearly in view—though I do not know that any author has as yet described them or their effects. Like the last point, this also must be taken up again.

To the state of the valves, in connexion with fatty growth on the heart, I would now ask the special attention of the reader, believing it, as I do, to be the most important point in relation with the entire subject. I hold that in fatty disease of the heart valvular disease is exceptional—that is, the two states are rarely

found to co-exist. Nor has this idea been taken up hastily. So far back as the year 1849 my attention was directed to this point, and has continued to be engaged on it ever since. At first I only had impressions that valvular disease was rare under the circumstances; but as impressions could not supply the place of facts, I set about tabulating all the cases of fatty disease I met. In this way, and in the course of years, I have gathered together upwards of 300 cases, and in these I find the proportion of cases of valvular disease is as one to four—that is, for one case where valvular disease existed, four occurred where there was none. It would be bold to say no error has crept into these figures—possibly there may have, but I can safely say it has not been intentional. Even allowing, however, that some error has occurred, enough would remain to prove that there exists a kind of opposition, if I may so speak of it, between fatty growth of the heart and valvular disease. Nor do I stand alone here, for I am able to quote from Quain's celebrated paper; and, as it was published without any special reference to the point now under discussion, it must be looked upon as very strong evidence in my favour—and, I would add, it is really curious to observe how his figures and my own correspond, for out of the 83 cases he gives, 17 only had valvular disease—that is, as near as may be, four to one. When two writers thus independently come to a similar conclusion, I know no stronger proof which could be adduced in favour of the point arrived at. The only writer, as far as I am aware, who has discussed this point is Hayden. His conclusions do not

go at all as far as mine, for, out of 95 cases which make up his table, about one-half, or a little over it, had no valvular disease; so that, on this showing, the numbers would be pronounced equal, but even this is an important conclusion to have reached. It is, however, to be observed that the entire 95 cases have not been included in this division. The writer excludes no less than 26 cases, on the plea that the state of the valves is not mentioned. To my mind this seems a very questionable way of looking at the subject. For surely in such a case, no mention being made of the state of the valves, implies they were healthy. The idea that they might have been diseased, and yet not mentioned, cannot be entertained; whereas, the idea that they were sound, and, being so, were not mentioned, is quite natural. This may be considered special pleading, but it quite satisfies my own mind, and sure am I that if all the writer's cases had been included he would have arrived at the same conclusion as Quain and myself.

But this point can be considered in another aspect, for we now have writers who state expressly that no morbid sound is to be expected, or at least that it is rare. Loomis states that the absence of cardiac murmur is characteristic of fatty heart. Fatty disease of the heart, says Bellingham, does not, *per se*, give rise to a murmur; and Walshe states that basic systolic murmur and valvular murmur, of any type, are rare. Lastly, the late Dr. Ormerod, writing to myself in the year 1850, uses the following words:—"I quite agree with you as to the rarity of the coincidence of fatty heart

and valvular disease."* When evidence of this kind, and from such men, is joined to what has preceded it, the conclusion seems to me unquestionable that valvular disease and fatty disease of the heart seldom co-exist. Nor is this all the evidence which can be adduced on the point, for it is known that a very considerable number of deaths have occurred under the use of chloroform, and in the great majority of these it is stated, in the most explicit terms, that a stethoscopic examination had been made, and that nothing abnormal was detected—in other words, there was no evidence of valvular disease; and yet, in very nearly every instance, a fatty state of the heart was found. In Snow's book alone there is very little short of 50 such cases given, and a vastly larger number have since occurred, and with similar results, as every reader of the periodicals must have observed. Unless there be some such law, then, as I have been endeavouring to illustrate, it seems to me next to impossible to explain the facts which have been adduced otherwise. It will be observed that the authors who have written or spoken on this subject have all arrived at a similar conclusion. Any difference is one of degree, not of kind; and even Hayden's figures—though I cannot accept them from his point of view—prove there are more cases of fatty heart without valvular disease than with it. Taking everything into account, I think I am fully justified in concluding that valvular disease is exceptional in cases of fatty growth on the heart, and that

* It is to be observed that the remarks of these writers all appeared subsequently to my own published observations.

the proportion may fairly be put down as four to one—that is, out of every five cases one only will be likely to have valvular disease. I have dwelt at some length on this point, believing it, as I have already stated, to be the most important part of my subject.

In close connexion with it I have now to notice the character of the valvular disease, when such exists. In the first place it is to be observed it is the aortic valves which are usually implicated, and, when the organ is affected with fatty growth their state is peculiar, and, as far as I am aware, has not received the attention it deserves. It was described by myself many years since, and no writer in these countries seems to have noticed my paper, though it has been in France. This state is where the valves are thickened and pulpy like, this being due to fatty deposit. But the great characteristic is that the surface of the valves is smooth. Hence follow results which are of much consequence in a diagnostic point of view, and to be noticed further on. It is worth noting that this state of the valves does not by any means cause them to act imperfectly. I have repeatedly tested them while in this state by allowing a stream of water to flow down the aorta towards the heart, and yet not a drop passed through. It has been already noted that it is the aortic valves which present the state of which I have been speaking. I have not seen it in the pulmonary artery; neither is it at all common, even in the aortic valves, where the heart itself is in a state of true fatty degeneration. It seems to me to be confined in a great measure to that state of the organ where fatty growth exists and where there is hypertrophy of the

kind already described; and it might be called fatty hypertrophy of the valves, and so be quite in keeping with the general state of the organ. It need scarcely be observed that this condition of the valves is in very marked contrast with the same parts when ossific deposit occurs, and when the two states are combined, which is by no means uncommon—the fatty, I believe, very commonly precedes the ossific formation. The latter may, of course, exist *per se*, but I am speaking of the two states when they are conjoined. In cases where the mitral valves are involved the same condition precisely as that met in the aortic valves exist. Neither does it interfere with their functions here. Joined to this state it is to be observed that the fleshy columns are always hypertrophied—no doubt from fatty deposit. Some have thought that these columns were the first parts connected with the heart to exhibit fatty change, but the point has not yet been accurately settled.*

From the valves I am led on to the arch of the aorta itself; and here the results of fatty change—atheroma, as it is called—are very striking and very common; and, as with the valves, I believe fatty deposit always takes precedence of any ossific matter, that is, when these states co-exist. It is very common to meet the fatty change by itself, as already stated, but I have not seen ossific matter without there being also evidence of fatty disease preceding it. There is one feature connected with this

* Since this was written I find it stated that in dogs which had been largely bled at stated intervals the heart, on examination, was found to have become fatty by degeneration, and that the papillary muscles were the farthest advanced in the disease.

state of the aorta which calls for a passing notice here—I mean that inflammation often seems to play a part in it. Though I need not describe these appearances of inflammation, all must be familiar with them, and have even seen them where there was no sign of either atheroma or ossific matter. I have met cases, too, where the atheroma either was, or seemed to be, the result of inflammatory action;* in such the latter was very marked, whilst the atheromatous state was slight but distinct. These cases would appear to lead to the conclusion that inflammation was the cause of the atheroma, and some few writers hold this opinion. Paget, however, takes an opposite view. His words are:—"The whole history of fatty degeneration concurs to prove they are the result of defect, not of disease, of the nutritive process." With such opposing opinions I must leave the question undetermined, merely adding my own impression that inflammatory action has, in many instances at least, much to say to the formation of arethoma, and that this view has a very important bearing on treatment, of which more will be said further on.†

In connexion with what has just preceded I must speak here of the state of the coronary arteries, which are known to be so often diseased in cases of fatty heart.‡

* See a valuable paper on this subject, by Sir Dominic Corrigan, in Volume XII. of the *Dublin Quarterly Journal of Medical Science* (old series).

† Whether inflammatory action takes any part in causing dilatation of the arch of the aorta—a state of frequent occurrence in fatty heart—seems doubtful, but it is by no means unlikely.

‡ Out of the 83 cases given by Quain, 25 presented disease of these arteries.

Whether they are more frequently affected than the other arteries of the body it would be hard to determine. My own impression is they are not. Still their close relation to the heart itself, and the functions they necessarily carry on, render any disease in them of much more consequence than in other parts. To their diseased state has, we know, been attributed the affection called "angina pectoris," and there are also many who consider that fatty degeneration of the heart arises from this. Quain has given some very striking examples of the latter—that is, where the fatty change was very limited in extent, and where the artery leading to it seemed alone diseased.* On the other hand, it cannot be supposed that atheroma of an artery must exist in order that fatty change may occur. The whole history of the affection contradicts this idea; and again we know there are a number of cases of angina pectoris on record where the coronary arteries were not in any way diseased, so that the conclusion we must arrive at is that disease of these vessels can only act as predisposing and not proximate causes of either angina pectoris or fatty degeneration. Like other arteries the coronaries may be simply atheromatous, or this state joined with ossific matter, which may in a great degree block up their origin from the aorta; or, lastly, any of these states may be combined with dilatation of the vessels themselves.

The form of fatty growth on the heart, of which I

* It would seem that this statement must be taken with some reserve, for in Ogle's valuable tables it is specially stated "that though the coronary arteries were much diseased, yet the heart was only moderately, and in others very slightly, affected with fatty change."

have been speaking, rarely, if ever, exists by itself, but is accompanied by the deposit of fat elsewhere. It is the state, in fact, in which the individual exhibits signs of it in all those regions where it is generally seen. Of these I have already spoken, and need not do so again; but it is important to notice its growth in the chest. It will be seen on the outside of the pericardium and filling up the anterior mediastinum; also along the free edges of the lungs and the pleural surface of the intercostal muscles, as well as that of the diaphragm. It is to be observed that when it affects those parts its quality differs much from what is seen in other regions. It is much softer in character, and diffluent would scarcely be too strong a term to apply to it.* Something of the same kind occurs elsewhere—as, for instance, about the kidneys, but I have not seen it to the same degree as in the chest. It need scarcely be observed that this superfluous fat, no matter in what region it is seen, is very commonly of a deep yellow tint.

The second form of fatty disease of the heart, on which I would now make a few remarks, is that known as "fatty degeneration"—that is, where the place of the muscular structure is literally displaced by oil granules or fat. All trace of muscular texture disappears more or less, and nothing but fatty matter is seen under the microscope. This form of the disease affords some marked contrasts to what I have been describing, and it is essential that it should be considered separately. In its most perfect form anything of what may be called

* Quecket states that amongst the muscles of the bear fluid oil or fat may be found.

hypertrophy is absent. In this respect the difference is striking, for hypertrophy always goes with fatty growth, whereas with fatty degeneration this is seldom seen. In some cases indeed real atrophy exists, and the organ weighs less than in the normal state, of which Ogle has given some striking examples. This form of degeneration, I believe, occurs mostly in thin persons, or who at least cannot be called fat, and is to be placed amongst what Paget calls the "lean degenerations." The part of the organ it first attacks would seem not to be fully settled. Some have stated it is the external surface shows it first, and others the internal, and more especially the carneæ columnæ. My own experience is in favour of the latter. It is a degeneration which certainly occurs most frequently in the ventricles, and I think it may be assumed that it is more common in the left than the right. Quain gives the proportion as 8 to 5, but the numbers are not sufficient to settle the point. It may be observed that when rupture of the heart occurs it is much more common in the left ventricle than any other portion of the organ, and this in itself goes strongly to prove that this ventricle is the most liable to fatty degeneration,* for this state it is which leads to the accident. It is also to be noticed that this degeneration is very apt to exhibit itself in patches, as it were, and this gives the marbled hue which is so very common. Degeneration, too, may exhibit itself side by side with perfectly healthy muscular structure; or, again, the entire thickness of the ventricle may seem to

* It is worthy of remark, too, that the left coronary artery is more frequently diseased than the right.

be nothing but fat, in which it requires the minutest examination to detect a trace of muscular fibre, and the wonder is how life could have been carried on at all. The celebrated case given by Cheyne was of this character.

When fatty degeneration of the heart occurs in its present form—that is, with little or no hypertrophy—it is worthy of note that the valves, both aortic and mitral, are very generally free of all disease. When it does occur it has, in my experience, been the merest trace. On the other hand, I have seen them in a state that I could not but consider as one of atrophy, so thin and transparent were they. This state, for reasons to be stated further on, it is very important to bear in mind.

I have just spoken of rupture of the heart, and it must be allowed to be the gravest accident to which the organ is subject. It may be assumed that it only occurs when the heart is degenerated, and, as already stated, the left ventricle is its most common seat, and usually on the anterior surface—towards the apex too, rather than the base of the organ. It would seem that when it occurs it begins from within, for the rent has been found larger on the inner surface than the outer, and this may be adduced in proof of the idea that degeneration begins from within. It is to be observed that the tear is sometimes only partial, which occurrence was met in the case of Abercrombie; and here it had opened a vein, which led to a pouring out of blood into the pericardium. Quain gives a case where two rents were found externally—side by side. This would show

a very strong predisposition to the accident—in other words, the degeneration has in such cases been very great.* In connexion with rupture of the heart itself it may he stated that the columnæ carneæ have also sometimes been found to have given way, and in one very remarkable case both a rupture of the ventricle was found and also a rupture of one of the fleshy columns—which latter blocked up the rent in the ventricle. The septum of the ventricles has been torn in some instances, and, again, blood has been poured out into the substance of the organ without any apparent rupture. This latter state has been called cardiac apoplexy.

Adhesions of the pericardium, both partial and general, are by no means infrequent in connexion with fatty degeneration. In my experience they are rare when fatty growth is the form the disease assumes. The adhesion is often found at the apex of the heart only, and then it sometimes occurs that this portion becomes dilated, so as to form a kind of aneurism, of which I have seen different examples. When the adhesions are general and the walls of the heart degenerated, then dilatation is very apt to ensue; there is rarely any tendency to hypertrophy in these cases, such as there would be if the heart were healthy in its structure.†

* The number of instances given by Quain in which rupture of the heart took place seems to me very remarkable. He gives 28 cases out of 83. I think I may say this proportion is much greater than occurs amongst us, and would make fatty rupture of the heart almost an English disease.

† Many hold that adhesions have not a tendency to lead to disease of the heart. I cannot accept this view. In a paper published some

A form of acute pericarditis may sometimes be seen in connexion with true fatty degeneration. Four such instances have come under my own notice, and it is worthy of remark that in three of these the disease was absolutely latent. In the fourth a suspicion existed that pericarditis was present, but it was not confirmed till after death. The cause of this extreme latency lay, I believe, in the fact that the effusion was in all the cases almost purulent, and hence incapable of generating a *frottement*. There was no lymph adhering to the serous surface. The general symptoms present were what would be described as those of low fever.

Before concluding this part of my subject a few points still remain to speak about, which could not have been introduced elsewhere. One of these is the state of the cornea known as arcus senilis, which Canton has so well described and shown to depend on fatty deposit between the layers of the cornea. My connexion with Simpson's Hospital has afforded me large opportunities for observation on this point, and it may be stated in round numbers that more than half the inmates are affected by this change.* It is much more common in those above fifty years of age than those below that age, but several examples have come under my notice where

years back in *The Edinburgh Monthly Journal*, it was, I believe, conclusively proved that adhesions do almost surely lead to disease. In the cases tabulated by myself all instances of valvular disease were carefully excluded.

* Hayden states that out of 95 cases only 8 exhibited arcus senilis. This marked difference between us is readily accounted for when it is recollected that my statement applies almost exclusively to persons above fifty years of age.

it was present in younger men. At what age it is first to be observed I cannot take on myself to determine. Canton speaks of cases close to thirty years of age where the change was visible; and I have seen it, and more than once, under forty. It may be assumed, however, as certain that fifty years of age, or about that period, is the most usual time for it to make its appearance. The tendency of this change is to affect the border of the cornea—at first locally, and this very usually above and below, and then it spreads laterally, both downwards and upwards, till at last it meets, so as to form a complete zone. This zone is almost always broader above and below than at the sides; but it is broader above than below, and on this point I go entirely with Canton, and would consider it very exceptional when the lower portion was the broadest. Such has been stated to be the fact by Hoskins, who, however, gives but twelve cases. I have seen this state but once. At an early stage of this change it often is entirely confined to the upper part of the cornea. Several instances of this have come under my notice, and it is very important to be aware of it; for it may be readily overlooked, as in such cases the eyelid covers the diseased part, which will, of course, not be visible unless the lid be raised.

In some instances where the zone completely surrounds the cornea it has everywhere presented the very narrowest appearance, and in such it will be observed that it is not broader at any one part, being quite uniform all round. In other instances I have seen it has not been the very border of the cornea was attacked—on the contrary, the fatty zone occupied a

space, leaving a ring of perfectly healthy cornea outside it. In other instances, again, the zone has been distinctly double—one within the other. I am not sure whether Canton has described this. When it does occur the zones are seen to differ in colour, and the innermost is the whitest. I take it they do not form at the same time.

As a general rule the zone is of a grayish colour, and gives the idea of being semi-opaque. Sometimes there are specks through it, and it is then mottled. In other instances the deposit is whitish in colour, or it may be even white, and this, in one sense, is the most serious form it can assume, for then it almost reaches a deformity which it is scarcely possible to overlook.* It is when in this state that the medical man may be consulted as to how far it is possible to remove it. It can scarcely be spoken of as affecting vision, though cases have been described where a more than ordinary breadth of the cornea has been involved, and it is possible that the entire cornea might be so affected.

A subject of much more consequence than any variations in form which the arcus presents is the question of its relation to fatty disease in general. How far is its presence a sign of the disease? May it exist, and the individual be at the same time quite healthy? The answers to these questions will come in much better

* When the arcus is white or whitish it is often the lowest portion of the cornea presents it, and it has seemed to me that this was due to the greater exposure of this part. But, though the lower portion may be the whitest, it is not, as already stated, the broadest part of the zone. It may be mentioned that the zone is sometimes better marked on one eye than the other. I have never seen it confined to one eye alone.

when I have to speak of the Diagnosis. I shall only say here that I believe Canton has gone too far in his statement, for he seems to think that the arcus, when advanced, always indicates the presence of fatty heart. If negative evidence be proof to the contrary, I have had enough to convince me that this opinion is incorrect. But I shall reserve for another place what I have to say on this point.

In the preceding pages there was occasion to speak of the comparative rarity of ossific deposit in the valves. I would again revert to this point, and observe that, though the valves escape, there are three places where ossific deposits are met. One of these is the coronary arteries, which are known to be the seat of this deposit.* When this occurs I believe it is invariably preceded by the atheromatous state; and, though I have spoken of this before, I would repeat it, for the order in which it takes place seems to me one of great consequence to recognise; and the same thing, I believe, happens in the arch of the aorta—the atheroma first, and then the bony deposit. But there is still a third place where this ossific deposit seems very common, nor do I know it has been noticed—at least in connexion with fatty disease of the heart. I speak of the ribs where they join the sternum. Everyone must have noticed the frequency of ossified ribs. But the point of consequence is, that when this state exists, it is very remarkable how often the heart presents fatty disease at the same time. Now there is no difficulty at all in ascertaining this state of

* Quain gives 25 cases out of 83 where these arteries were ossified—that is, something less than one-third.

the ribs. Hence it gives valuable help in a diagnostic point of view, for, when present, it affords a strong presumption that the heart is fatty; or, at least, it directs our attention to the state of that organ. On the contrary, if the ribs be in their normal state, the heart will most probably be so too. The entire value of this observation turns on a point to which there has been occasion to refer already, and more than once, which is—that anything of ossific deposit is secondary, in point of time, to fatty change. Whether in the ribs themselves fatty change precedes the ossific deposit I shall not take on myself to assert, but I believe it does, as I also believe the two changes do not go on *pari passu*, but that what we know occurs in tubercle also takes place here, and so it is more than probable the ossific change is the last of a series of processes, in which fatty deposit occupied an earlier stage.

This state of the ribs, or, more correctly, of the cartilages, has a very important bearing on other parts of my subject. It modifies in a striking way the act of respiration, and, when we come to consider it, this is just what we should expect. The act of breathing is not performed at all as it was in earlier life. Hence, if we are not prepared for it, or allowance made for the state, the chances are our prognosis will be incorrect. But this part of the subject will have to be considered again.

While speaking of rupture of the heart as a sequence of fatty disease of the organ, a few points were omitted which have a relation to the subject, and of which I would now speak.

I have already said that the other muscles of the

body are liable to fatty change just as the heart is, and that I had observed this more particularly in the bodies of drunkards. Now, when in this state the muscles are liable to rupture, and even from a very slight strain. The accident with which surgeons are familiar where it is supposed the plantaris muscle tears is, I believe, of this kind. It usually occurs in parties who have passed middle life, and who, while dancing, suddenly feel as if they had got a blow, which at once disables them. In one case of this kind, of which I was cognisant, the individual subsequently presented all the symptoms of fatty heart, and so died. When other accidents of an analogous kind take place, the presumption appears to me very strong indeed that it arises from fatty change, and it is in this way that I would explain an accident which occurred, within the last five years, to a high dignitary in the Irish Church. In this instance the muscle attached to the upper part of the patella gave way, and, if I be rightly informed, on both sides. The details, however, of as remarkable a case as any on record will be found in *The Lancet* for July 6th, 1878. In this instance the patient had met with a dislocation of the humerus, and the surgeon, Mr. Smith, of the London Hospital, was endeavouring to reduce it, by placing the heel in the axilla, when the whole anterior fold, including of course the pectoral muscles, gave way. After the patient's death, which occurred from sloughing, all the torn muscles were found to be affected with fatty degeneration. This was certainly a case to teach caution.

There still remains one point of a general character to which I would here ask attention. We know that

when fatty disease exists, and even of a widespread kind, the greatest possible differences are seen as regards the duration and termination of the case. This may be accounted for, in a degree, by the surroundings of the case, the position in life, &c. But, whilst allowing that these have considerable influence, I believe another force exists which has infinitely greater—and that is, temperament. We know very little of the nature of this agency, and see it only by its effects. But that it exists is certain, and that it exerts a very marked influence over the progress and duration of the fatty diathesis is equally certain. In a prognostic point of view its bearings are of the very greatest moment. Williams is, I believe, the only writer who has drawn particular attention to this subject. Like other topics of which I have had to speak, this one also will come under notice again.

CHAPTER II.

THE SYMPTOMS AND DIAGNOSIS OF FATTY HEART.

In commencing this chapter, some such division of the subject as was made when speaking of the morbid anatomy will be followed, though it may not be possible to keep within the exact lines, owing to the fact that the two forms of the disease frequently co-exist. I shall, however, speak of the symptoms of fatty growth as distinguished from those of fatty degeneration. I believe it is quite possible to separate them, at least in many instances. Nor can I coincide with the opinion of Hayden, and indeed of others, who have stated their views on the point. The former thus expresses himself:—"I have already intimated that mere fatty growth upon the heart, without degeneration of its muscular substance, is not announced by any special symptoms or signs, save in so far as it may impede the motions of the heart mechanically, or cause thinning of its walls by continuous pressure upon them." Now, this statement I cannot accept, and for reasons which have been partly given, whilst speaking of the morbid anatomy of the organ—I mean where fatty growth is the only lesion present, for lesion it must be called. It will be recollected that, when speaking of it, I drew attention to the fact that this growth was a mere addition to an otherwise healthy heart, which, if weighed, would then be

weightier by just so much fat as had grown upon it, and that this was very commonly from three to six ounces, making the weight of the entire organ range between twelve and fifteen ounces. Now, when this state of things exists, my experience has taught me that the pulse becomes diagnostic, for it gets full and large, and, in some instances, even bounding. Indeed in some rare cases I got the impression that a certain amount of hypertrophy of the muscular texture was present; and when we recollect the additional labour thrown on the organ, such a result is not impossible, though it would be a difficult point to demonstrate. It will be observed I am speaking of the pulse of a person who is, or is supposed to be, quite healthy. The pulse beats at 65, and is normal in every respect, except that it is fuller than is natural. If in such a person an attack, let it be supposed, of pneumonia occurs, the pulse will usually then rise some 20 beats, and it is well worth noticing that in these cases it seldom gets higher. If it should chance to rise to 120—and this is not very high for a man—the case will be apt to end fatally, no matter what form of disease is present. Over many years I have seen but two examples to contradict this remark—hence the great importance of recognising the state of the heart of which I am now speaking.

It has been already stated that fatty growth on the heart is rarely attended by any morbid sound, such as valvular disease would afford. Should it, however, occur, my experience is that it is a single soufflet occupying the first sound of the heart, and situated over the aortic valves. It is very generally too soft in its

character, and frequently hard to catch. When this is the case, I have been in the habit of adopting a plan which I brought before the Medical Society of the College of Physicians some years since. It consists simply in placing the patient in the horizontal position. When this is done, a sound which before was doubtful becomes at once clear and distinct; it is lengthened, too, in character. I think I may state that as long as the soufflet remains soft, this rule holds good. The point seems to me one of very considerable consequence, as bearing on insurance, &c., and I am not aware that it has been noticed by any writer. It bears, too, on the more immediate subject before us; and in several cases I have been enabled to detect a soft murmur while the patient was lying, which disappeared or became most indistinct when he rose up. The cause of the soft character of the murmur has been already described, and need not be again spoken of.

I cannot leave this part of my subject without alluding to the labours of the late Dr. Stokes, as connected with this point. For, by direct clinical study, this great observer arrived at the conclusion that the diagnosis of fatty heart might be made from the presence of physical signs. This, let it be observed, was the first occasion that anything of the kind was attempted, and, as far as I am aware, the paper has not received that attention from subsequent writers to which it was entitled. This paper appeared in *The Dublin Journal* for 1846, and describes a combination of symptoms which, as the author explicitly states, are peculiar, and belong to no other cardiac affection. The symptoms consist in the

presence of a single soft soufflet over the mouth of the aorta, occupying the first sound of the heart, and leaving the second normal, and, in addition, the occurrence of pseudo-apoplectic attacks. Now, I believe the diagnosis founded on these symptoms to be absolutely correct, and I would further add that it is really curious to observe how closely it agrees and is borne out by my own published observations—I mean as to the exact character of the valvular disease when it exists. The conclusions at which Stokes arrived were, as I have said, derived from direct clinical observation, whilst my own, I may say, were the result of the study of the morbid anatomy of the disease, and, I take it, must have escaped his notice, as he does not allude at all to the peculiar character of the valvular disease present, which I believe to be of much consequence. At any rate, the combined observations of each afford as strong proof of the truth of the diagnosis as the nature of the subject admits.

But whilst thus speaking of a diagnosis of fatty heart, it must not be forgotten that, in one sense at least, it is incomplete, for the combination of signs given by Stokes are rarely present, and, it cannot be too strongly pressed on the reader, must be considered exceptional. It has been already stated that in Quain's 83 cases 17 only had valvular disease, and of these again there are but 4 where the murmur occupied exclusively the first sound, which leaves 79 cases in which the diagnosis founded on the combination of symptoms laid down by Stokes could not have been made. Still, when they are met they may be considered diagnostic.

In direct connexion with my present subject there is another physical sign to be spoken of here, and which I am not aware has been noticed in relation with the diagnosis—I mean enlargement of the heart, not due to hypertrophy in the common sense of the term, but to fatty growth. This state has been already described, and now I only wish to speak of it because it can be often diagnosed during life. That it is of frequent occurrence is certain. In Quain's table, so often referred to, under the head of "Fatty Growth on the Heart more than usual," no less than 58 out of 83 cases are so given, and my own experience accords entirely with this. Now this enlargement, I repeat, can be often made out during life, and, taken in conjunction with other signs, I have no hesitation in stating that a positive diagnosis can be made, and we may pronounce with certainty as to the existence of a heart which is affected with fatty growth. The reader will at once understand that the enlargement of which I am speaking is ascertained by percussion, used in the ordinary way, but I am free to admit it is not always available, and hence it is I have used the word "often." The amount of fat on the heart may not be so great as to increase the natural dull sound over the organ, but a more common cause of difficulty arises from the external fat, which is of such constant occurrence in the class of cases of which I am now speaking, and here it is that an observation made in a former part of this essay comes into play. Some persons get fat in one region and some in another. One will exhibit it in and on the abdomen, and another in and about the thorax. When it is the former, per-

cussion is much more available than in the latter, which can be readily understood. To speak of the mode of percussion would be entirely foreign to my present purpose, and I shall only observe of it that to elicit correct results it must be done, what I would call, deeply, and for this purpose the pleximeter will be found very useful. I may remark, too, that the percussion should in the first instance be over the sternum, through its whole length. In its normal state, I need scarcely say, a clear sound will be heard, but in the cases of which I now speak the sound may be dull owing to the fat deposited behind the sternum. This state can be readily diagnosed, and I have done it, but it is well to say that when present it adds to the difficulty of ascertaining the relative size of the heart; still, allowing for these difficulties, the size of the organ can often be ascertained, and our diagnosis so far advanced.

The points, then, on which the diagnosis of fatty growth mainly turn are the following:—Firstly, a large full pulse, beating at the natural standard of frequency; secondly, evidence derived from percussion of the heart's dulness being more extended than natural; thirdly, the possible presence of a soft murmur over the aortic orifice, occupying the first sound of the heart only, and leaving the second normal; and, lastly, the condition of the individual as to his being fat or becoming so. If all these be present the diagnosis may be looked on as certain. On the other hand, the absence of murmur would not, for the reasons already stated, affect the diagnosis, for the chances are four against one that no

murmur will be present, and yet the organ may be seriously involved.

I have thought it right to introduce this part of my subject at the beginning of the chapter on Diagnosis, because it enabled me to bring prominently forward Stokes's observations, which seem to have been overlooked by succeeding writers, and because the state of the heart, as affected by fatty growth, entails consequences which have not been noticed as leading to a correct diagnosis, which unquestionably they are capable of doing. As the state described is by much the most common form of fatty disease of the heart, it is the more important that it should be clearly recognised. In a prognostic point of view, too, it is one of much consequence to keep in mind, but this part of the subject will come in better in another place.

The observations just made will enable me now to enter into the several symptoms which have been described in connexion with fatty heart, and for the sake of description these may be divided into those referable to the nervous, respiratory, circulatory, and muscular systems. These I shall take in the order in which they are placed, and first of the nervous system. That it is very often profoundly engaged, no matter what form of fatty disease of the heart exists, admits of no doubt. Where it is merely fatty growth, however, of which I have been just speaking, nervous symptoms are not by any means as frequent as when degeneration sets in. Hence, as long as the case presents nothing but this fatty growth, the probability is that no nervous symptoms will show themselves. We know, however,

as a matter of experience, that this form of the disease has a powerful tendency to change, and that in the course of time the heart begins to degenerate, and then it is that the nervous system presents certain symptoms. It is not, however, so much because the heart itself has degenerated that these symptoms arise, but because the diathesis on which the state of the heart depends is extending; and this, I believe, to be one of the most important views which can be taken of the entire subject. It has been noticed before, but I must repeat here, that fatty heart is rarely the localised disease it is usually supposed to be. That it does occur without other parts being involved is certain. In my own experience, however, it is very exceptional, and fatty disease in other parts than the heart is by much the most common state to meet—in other words, fatty heart is usually but a part of a general disease. This is exemplified in the fact that I have seen repeated instances where the individual was supposed to be getting disease of his brain, and so he was. But very little investigation was required to show that the symptoms were due to the existence of the fatty diathesis, from which the heart itself and other organs had previously become seriously involved. In other cases, too—and I am sure I am now stating what has occurred to others as well as myself—some defect in the sight has led to an oculist being consulted, and yet the symptoms present turned out to be but a part of the diathesis I am endeavouring to describe. That cases of this kind occur, in which the symptoms present are misinterpreted, seem to me certain; and as this part of my subject is

of very great importance I introduce here a case taken from a well-known author, which will convey, better than any description I could give, a good idea of the class I wish to speak about. The case is very much curtailed from the original, the leading symptoms alone being given.

Case.—A man, aged forty-six, not at all anæmic; hair gray; had led a very active life. After an attack of rheumatism and griping diarrhœa, was seized with loss of speech, from which he recovered *by the use of gin.* Three months later, having been well in the interval, he lost his memory; was heavy and dull; but after treatment became quite lively. He used then to have pain and weight in his head, with the feeling of pins and needles in his legs. His speech was slow, his memory much impaired, and the right hand so unsteady he could not write. No disease of thoracic or abdominal viscera. The day after being to the Crystal Palace the author found him ill and weak, and the mental power so much impaired he could not make his way. I found him, says the author, with cold skin and feet, lips pale, and complaining of pain in his head. Under the use of stimulants he rallied. Later still other similar attacks occurred, some more and others less severe. Finally the author was induced to bleed him from the arm. But this did not improve his state, and very shortly he got epileptic attacks, with paralysis of one side, and so he sunk. A *post mortem*, made twenty-eight hours after death, disclosed a very pale scalp and cerebrum, the arachnoid spotted white, "and lifted up by clear fluid, which was abundant everywhere." The vessels appeared

fairly healthy. All the other parts were carefully examined, but to the naked eye there was no evidence of morbid change in any of them. The only change the microscope detected was the deposition of orange-coloured pigment masses along the vessels of the two cerebral ganglia. In the fornix, however, the fibres seemed to be in a great measure disintegrated. "The heart was very flabby indeed, but the muscular structure of the left ventricle was fairly healthy."

It was much to be desired that the author had told us what he meant by the expression "fairly healthy." It was clearly something more than mere flabbiness, and I have no doubt the organ had undergone fatty degeneration. The author, I should state, seems quite at a loss to explain the cerebral symptoms present. I find it hard to account for his view of the case. For it will be observed that the serum was abundant everywhere, and in addition there was marked disease, though it may not have been very extensive, in the brain proper, whilst the disintegration of the fornix must have been attended by the presence of fat granules, though we are not told so. For myself I may say I have never seen this state of parts that it did not produce symptoms during life that are easily recognised, and may be as readily diagnosed. It will be recollected that when speaking of the morbid anatomy of the nervous system in relation with fatty disease, I spoke especially of the presence of serum as constituting an important stage in the process; and, further, noticed that most writers, if not all, had entirely ignored its presence, or spoken of it as being incapable of causing any symptoms during life,

and that Wilks in particular had upheld this latter idea. From it, I must again say, I entirely dissent, and the case which has been just given fully bears out this statement. But there is still another point in connexion with the case which calls for notice. The author never seems to have entertained the idea that the heart might have been weak, or affected with fatty disease. Yet it is stated again and again that the pulse was very feeble in the attacks, and also that some of the worst of them were at once relieved by stimulants. Such facts, I take it, are amply sufficient to lead us to conclude that the circulation was weak, and most probably from organic disease. On these two points, then, the case given seems to me to have been misinterpreted. Nor would it be difficult to give other cases very similar, but they would be out of place here. I may say, however, that the class of cases, of which the one given is an example, is of frequent occurrence; and, further, that it calls for a more distinct recognition from the profession than it has hitherto received.

Taking the case as a kind of model, I may now proceed to speak of the several symptoms separately which come under the head of nervous, and which have been observed in connexion with fatty disease of the heart. And foremost amongst these stand the attacks of pseudo apoplexy, which have not, however, in my own experience, been at all as common as other symptoms referable to the brain. Their main characteristic, as many have already pointed out, is the complete and comparative rapid recovery from the attacks, and in their leaving no paralysis afterwards. In the first instance, in fact,

the attacks are but momentary, and are neither preceded nor succeeded by any symptoms. The patient has no notice of what is about to occur, nor any recollection of the event after it is over, and they recover quickly. During the attack the face is pale, and the pulse very feeble, if felt at all, and there is nothing of convulsion. The attack itself is more of the nature of a faint than anything else. In several instances which I have seen an attack of this kind has been the first intimation of the nature of the case; and, strange to add, that in some of the instances the attack never recurred, though the patients ever afterwards had signs of fatty disease. In one instance a gentleman of sixty-six was standing at prayer in his place of worship when he fell as if he were shot. From that out he never lost the symptoms of fatty disease of the heart; but, though he lived many years subsequently, no similar fit showed itself. Another gentleman of seventy-three, just after eating his breakfast, had walked out of his hall-door, when he was seen to drop suddenly. He never had a subsequent fit either. Something analogous to this occurs in many cases where the symptoms are referable in the first instance to the heart and not the brain, of which Hayden gives some examples. But usually when fits of this kind occur they are repeated, and in the course of time other symptoms are added both before and after the fit. It is very important to recognise these additional symptoms, and our inquiries into the point cannot be too particular, for when they occur they indicate a very much advanced stage of disease. I speak now of such symptoms as loss of memory, slow speech, paralysis, &c.

When these occur either before or after a fit they seem to me to show that most likely fatty disease of the blood-vessels of the brain is commencing, if it be not already present; and the diagnosis may, I consider, be rendered absolute if any permanent congestion of the outer surface of the body be present—I mean such as had not previously existed. When congestion such as I speak of shows itself, the fits of syncope are, in my experience, much more likely to be attended by convulsions or convulsive movements, and the fit itself partakes much more of the character of genuine apoplexy. These changes in the character of the fits seem to me readily explained by the invasion of the cerebral blood-vessels by fatty change.

But though the tendency of fatty disease is very generally to progress, it is to be noted that in some instances the affection is or seems to be very stationary—that is, certain cerebral symptoms which are known to be caused by a fatty heart will go on for a long period without any apparent change. A striking case of this kind is now, and has been for the last five years, under my notice. A gentleman of seventy-three has had repeated attacks of sudden loss of consciousness, of which he had had no previous notice. Whether walking or driving they occur, and his face has been repeatedly disfigured by the falls. He has marked arcus senilis and other signs of the fatty diathesis, as well as some which show the heart itself to be engaged. His recovery from each attack is very rapid and perfect. But the point I would notice is, that no appreciable change has taken place in the fits since I have known him, now five years. During

the fit he becomes very pale. Other cases, though none so marked, have come under my notice. In fact, fatty disease, just as other affections do, becomes at times stationary.*

It has been already stated, and I would repeat the statement, that these fits have been, in my own experience, very much rarer than other cerebral symptoms. Thus double vision, or sudden loss of it, or slow and hesitating speech, or emotional symptoms like crying, and, above all, a temporary loss of memory, whether for words or of a more general character, are each and all of far more importance, in a diagnostic point of view, than are the fainting fits, and for the simple reason that they are much more common. Very few cases indeed of the fatty diathesis occur which do not present some modification of these symptoms; nor can it be too often repeated that they are often present, almost to the exclusion of those connected with the heart itself, which, however, if closely examined, will be found to be

* It is strange that recently (Nov., 1879) a gentleman, aged fifty-eight, came to me complaining of sudden fits of unconsciousness, which have gone on for the long period of ten years. The reason he now came was because they were becoming much more frequent. He has lived well, and taken too much strong drink, and is of rather a full habit of body. His pulse is full, compressible, and there is no intermission whatever, nor is there any morbid sound over the heart, but the sounds are obscure. Though he can walk well and fast, he cannot attempt to run. The cartilages of the ribs are ossified, and arcus exists on the upper part of each cornea. The fits occur most frequently after breakfast, and when they do he drops quite suddenly, and as suddenly recovers himself. He has no intimation whatever of the attacks coming on. In this case, and as the result of my examination, I have no doubt there is both an enlarged and degenerated heart.

seriously diseased. Into these minute cerebral symptoms, if I may so speak of them, my present limits forbid me to enter, but there is one which has so often come under my notice as to call for some remarks here—I mean weight or pain in the head. A considerable number of cases of the kind of which I am speaking—that is, a fatty heart attended by cerebral symptoms—present this sign, and it is of considerable moment to recognise it; for if it be not, and the place it occupies in the diathesis, clearly understood, it is sure to be either overlooked or, as a symptom, misinterpreted. What, then, is this sign or its value? It shows that the stage of serous effusion has begun, for it is to this state that the weight and pain are due. I have already spoken of the state and the way the brain may be affected by it, and need not again describe it. Like other states it varies much in degree and in the amount of effusion present; and it may be mentioned that a large amount may exist, and yet may not give rise to any marked symptoms, or none at least in proportion with the amount present. This has come under my notice on several occasions, and it seems hard to account for it; yet it is not harder than the fact that a tumour in the brain which in one will cause excessive suffering will in another be absolutely latent. It may be remembered that in the brain of the late Professor Bennet, of Edinburgh, a cerebral tumour of considerable size was found, which had not caused any symptoms, nor been suspected during life. Be this as it may, when serous effusion exists it very generally causes either weight or pain; the intellect, too, is very apt to be slow, and more or

less blunted, and the patient inclined to fall asleep. In keeping with this state I have sometimes observed the conjunctiva to have slight effusion under it.

It is well worthy of note that the effusion may come on so suddenly as to constitute an acute attack, and so prove fatal. I have seen several such, and proved it by examination after death. In these cases the symptoms are those of apoplexy, and the effusion is very large, and usually very clear in its character. When the case assumes the chronic form—and this is by far the more common—the patient dies very gradually, the cerebral symptoms deepening from day to day or week to week. This state is usually attended by profuse perspirations. Convulsions are, as a whole, rare, and very much more apt to occur if there be any renal complication.

I have spoken of this state of effusion as being important to recognise. Nor is it confined to the brain alone, for it may, I know, be observed in the nerves of the lower extremities, when at the same time slight serous effusions exist here. In such the nerves will commonly be found watery, and it is particularly worthy of note that the effusion in the limbs seems never to proceed to the same extent as if it depended on hepatic or renal disease. It gets to a certain point, and there it remains. This in my experience has been so constant that when I see it I at once set about investigating the state of the heart. As showing, too, the low state of the nervous system in these cases, it is by no means uncommon for half-formed attacks of erysipelas and also gout to declare themselves in the legs. Whether other nerves than those of the lower extremities exhibit this watery state

I will not take on me to determine, but it is more than probable they do, for I believe the diathesis itself to be very general. As bearing on this part of the subject it has been observed that in some cases of acute pneumonia the eighth pair of nerves have been found in an abnormal state.

But there still remains another reason why the recognition of this stage of effusion, as it may be called, is important to keep in view; for when called on to treat cases of this kind our success will turn on it, and I think I may say that we have very considerable powers over this state, not in the way of actual cure, but by affording the most marked relief and, for the time, temporary benefit. When I speak of treatment, this part of my subject will be taken up again.

As a symptom of the fatty diathesis I may here notice paralysis, which is so often to be observed, and in such a variety of forms; it is occasionally the very first sign which attracts notice, and it may be by a hesitation, or more commonly by a slowness of the speech. Whether it be the speech, however, or the loss of power of a limb or one side of the body, all observers are agreed that it is in a very marked degree temporary, and this character serves to distinguish it from paralysis dependent upon organic disease. But it is to be observed that it is only in a sense it can be called temporary, for once it shows itself it may be assumed that certain changes have occurred in the frame, from which the patient never afterwards becomes absolutely free. Some cause there must have been for the paralysis, no matter how slight the latter may have been, and though the

patient seems to get quite well, he is not so in reality, and the slightest causes will induce attacks of paralysis again and again. In the earlier stages of these attacks it is to be noted that the use of stimulants drives them away entirely; but it is not so as the disease advances, for then other causes have come into play, and make the attacks much more lasting. When speaking thus of paralytic seizures, it is to be understood that they are not paralysis in the ordinary sense of the term, but only a state of weakness of the muscles, every one of which may in turn be affected. It would be quite out of place here to enter into any particulars of all these, but it may be observed that when the fatty diathesis is about to exhibit itself—and it cannot be too often stated that it is very constantly an affection of the whole system—the muscles of the body will be found soft and flabby, and no effort can give them the firm feel of health. I have observed, too, that the skin frequently assumes a dirty hue which no washing removes. At this stage, likewise, it is important to note that a very large proportion of those attacked fall away in flesh, as the expression goes. I look upon this as a very significant fact of coming danger.

Of the forms of paralysis which attack the external muscles, I will here speak only of the form which resembles paraplegia, which, once observed, it is scarcely possible to mistake. The patient goes along slowly, not raising the foot to the ordinary height off the ground—hence a very slight impediment will throw him down; and if the disease be farther advanced, the patient literally slides the feet along the ground. It will be

observed that this state affects both feet equally, and in many who have brought on the disease by the abuse of strong drink it is a very characteristic symptom. It is worthy of remark, too, that, when lying, these patients have much more power over their legs than when up. I have rarely met this kind of paralysis that, on inquiry, I did not discover other marked evidence of the fatty diathesis elsewhere, and especially in the heart itself.

That this kind of semi-paralysis, as it may be called, affects other external muscles of the body, and this owing to fatty change, scarcely admits of doubt. I have already spoken of it as involving the pectoral muscles, and it may affect, too, the abdominal muscles, or a part of them—and so, I believe, of other muscles—and it is worthy of note that this state is often attended by a sense of uneasiness which sometimes amounts to pain, and which it becomes important to recognise.

The fatty change is known to affect the muscular portion of all the hollow viscera—hence the loss of power here exhibits itself in laborious digestion, in sluggish bowels, in slow evacuation of the bladder, &c. There is one muscular organ which, however, calls for more than a passing notice—I mean the diaphragm. That it is very often changed by fatty disease is certain, and I believe that in no part of the body does the change entail more serious consequences than here. If such a thing were possible, I would say that fatty degeneration of the diaphragm was a worse disease than that of the heart itself. Many will question such a statement, yet such is my conviction. No matter how far fatty disease of the heart may go, yet if there be

perfect rest the patient will be at ease, and even enjoy life. But not so if the diaphragm be affected—there is no rest here. One patient described it as a "sore oppression," from which he was never free. It is common in this state for sleep itself to be denied; hence we may often see a struggle going on between the longing for sleep and the still more urgent need for breathing—the *besoin respirer* of the French. It was only by degrees I came to recognise this state. From my examination of the heart I was puzzled to account for the dyspnœa, and I observed that frequently the patients referred their distress away from the heart—and, on the other hand, so often to the region of the diaphragm, that my attention became directed to it. In some a sense of uneasiness only was complained of; in others it amounted to actual pain; whilst some literally mapped out the diaphragm by drawing their hands across the chest, and stating that was the seat of their distress.

My attention, too, was called to this particular point in still another way. Some of them told me that they were losing the power of expelling the fæces; and when asked what they felt, they referred the sense of weakness to the region of the diaphragm—a very convincing fact, as I take it, of the importance of this muscle.

Now, these remarks do not in any way clash with the fact that, very generally, both the heart and diaphragm are affected together. But it is certain that the degree in which each organ is attacked varies, and in a most remarkable way. The heart may be much further advanced in the disease than the diaphragm, or *vice versa;* or the former may be partially affected—one side more

than the other. But further still, the heart may be absolutely healthy, whilst the diaphragm may exhibit extensive fatty change, as the case detailed by Dr. Head proves, and shows that the statement made by Callender must be taken with exceptions. When both organs are involved, the suffering will, of course, be at a maximum, and more particularly when the intercostal muscles are diseased, as they almost constantly are, and the ribs at the same time ossified. On the whole, an investigation into the state of the diaphragm will, in these cases, afford most valuable information, and is worthy of more attention than, as far as I am aware, it has yet received.

A symptom may here be noticed which, though I do not assert that it belongs to the nervous system, I yet believe has the closest connexion with it—I mean the animal heat. It is very remarkable how general a diminution of the temperature of the body is, and the more universal the diathesis the more striking it is; it will be observed, too, often when the patients do not complain of it, and this is a curious fact. On the other hand, they may speak of it in places where we would not at all expect it. Thus I have known it complained of in the side—and the stomach is a common place—and this without any cause which I could make out. If we are not prepared for this state, we may very readily be led into grave mistakes in relation with prognosis; but this part of my subject will be best considered in another place. I cannot find that this state of the animal heat has been observed in connexion with fatty disease, or as constituting a part of its natural history,

and yet it is a symptom of very common occurrence, and, as I believe, of much moment to recognise.

As it will not, I find, be possible to keep to symptoms which are strictly in connexion with the nervous system, I shall now proceed to speak of others, and in the first place of those which the face affords. In many cases there can be no doubt the expression alters much, and this has been described by all writers. The patient puts on the appearance of age, and in a comparatively short period the face loses colour slightly, and, as already stated, a loss of flesh is very common; and this is the more important because an increase of flesh has very generally preceded it. The whole aspect has been compared to a faded leaf, and it has often appeared to my own eye as if the change could be seen through the complexion which the patient still retained. When such a change as that described is present, it, of course, affords us valuable assistance, but it must never be forgotten that there are many exceptions to this, and many sudden deaths have occurred from fatty heart where no visible alteration had been observed in the countenance.

There are, however, certain special symptoms connected with the face which call for more than a passing notice here. And first of the arcus senilis, of which I had occasion to speak already. What is its value? Does its presence indicate the existence of fatty heart? The anwer must, I believe, be in the negative. I have seen it well marked in cases where all examination, either local or general, failed to detect anything wrong with the heart itself. I have also seen cases where the

arcus preceded by several years the symptoms of fatty heart which then set in, and in a form not to be mistaken. And, lastly, I have seen it supervene in cases where the evidence of fatty heart preceded by several years the appearance of the arcus. On the other hand, the presence of this sign cannot be considered in any other light than important. No matter how trivial in degree or extent it may be, it must still be important, for it discloses to us the fact that fat has formed in a part of our frames where it does not naturally exist, and hence we know that the fatty diathesis is present. The sign, too, is one which can be ascertained with the greatest facility, and once this is done our attention can scarcely fail to be directed to a closer investigation of the general subject. It is to be observed, however, that in many cases where fatty heart exists the sign is not present. It is, I believe, to Wilks we are indebted for this fact,* so that the absence of the sign does not justify us in assuming that the fatty diathesis is not present. In point of fact, as the arcus may exist without fatty heart, and the fatty heart without the arcus, we cannot make the latter a diagnostic sign of the former. The presence of the arcus gives us valuable help, but nothing more.

Another sign which looking at the face discloses is dilatation of the nares. I am not aware that this symptom has been noticed by any author, and yet it is by no means uncommon. I am not speaking here of a tem-

* This writer states further that when fatty growth alters the heart then arcus exists, but not with true fatty degeneration. My own perience does not confirm this statement.

porary state of action of the nares, but what, when once established, is permanent. It is a symptom which it is scarcely possible to overlook, and I have known it exist for more than two years before death. It is exactly of the same character as one sees in the early stage of acute pericarditis, or pleuritis; it may be seen, too, in some cases of fever, more particularly the form known as the "febris nervosa" of Huxham. In this latter disease puerile respiration will be found in the lungs, conveying strongly the idea that the system is in a state of alarm. I need scarcely add that this state of the nares, and in connexion with fatty heart, alters the expression very much. In those cases where it exists I have observed that bodily movement of even the slightest kind causes much distress.

In connexion with the last symptom there is still another which has often come under my notice, and yet it is not easy to describe what I mean. It is a peculiar mode of speaking that the individual acquires, and, it may be presumed, arises from the shortness of breath, and comes as it were by a kind of instinct. It is not that the ear catches any peculiar sound; nor could the symptom I wish to describe be observed if we were not looking at the face of the individual—when we are it is then quite easy to recognise it. There is a shade of deliberation about the mode of speaking, and as we look at the party we cannot fail to observe that he makes the most of an inspiration; and, if a commonplace expression could here be used, it might be said he kitchens his breath. I have no doubt that this, like many other symptoms, arises often without the consciousness of the

individual. I may state that I have never observed it except in connexion with fatty heart.

In addition to the symptoms just described, and still in relation with the face, we may often observe more or less signs of congestion of the ears, nose, cheeks, and lips. If these be present they always add to the gravity of the case, as I believe it may then be assumed that the blood-vessels have undergone degeneration of their coats. When these parts, and more particularly the lips, remain permanently livid, any general attacks of the brain are sure to be of a serious character, and their results much more lasting; and, finally, the time comes when, in one of them, the patient is carried off, and by what are commonly called brain symptoms. All through, however, the heart has been gradually degenerating, and is found so after death. The celebrated case given by Cheyne is an excellent example of this form of fatty disease. Such cases, however, are of very frequent occurrence.

It will be seen, then, that, taking the face as a whole, it is capable of affording very valuable assistance in arriving at a diagnosis in relation with fatty disease.

In coming to speak of symptoms referable to the chest, I begin with one which has recently attracted much notice, and is now known as "the Cheyne-Stokes" respiration, having been first spoken of by Cheyne, and subsequently more minutely described by Stokes. When it exists it is undoubtedly a valuable sign, but I consider it is to be taken as a sign of the fatty diathesis rather than of a fatty heart. For a long period it was thought that this kind of breathing could only arise from a fatty

heart, and no doubt they are very frequently conjoined. At last the case detailed by Dr. Head appeared, which proved conclusively that the heart might be healthy and yet the peculiar breathing exist, and in a very marked form. A single instance of this kind was quite enough to show us that the state of the heart was not the cause of the breathing, nor for that matter the state of the diaphragm either. For myself, I hold with those who consider that it is some state of the nerves themselves that causes the peculiar breathing, and I think there are good grounds for this belief. Something very like it may often be seen in the hydrocephalus of childhood, when it runs its usual course. I have often been struck with the likeness. The cerebral breathing, too, of fever, long since described by Graves, frequently assumes similar characters—that is, breathing which at first is normal goes on then to increase in intensity, and then suddenly subsides, to be followed again by the same sequence. It is true it never assumes the same regularity, nor indeed intensity, which is seen in fatty disease, but the similarity is sufficiently close to show that the cause must, I think, arise from the same part of the frame being involved, and, both in hydrocephalus and fever, we know that the nervous system is deeply engaged. I believe, then, that when this breathing shows itself in union with the fatty diathesis, it may be assumed that the nerves themselves are being involved.*

* From what is in the text it may be inferred that I do not consider the cause which Hayden advances as satisfactory as my own. He thinks that the peculiar respiration arises only in cases where the first part of the aorta is dilated. If this were the cause the phenomenon

Like many other symptoms of fatty disease this one is often intermittent, sometimes in a very marked degree. I have known weeks elapse without its appearance, though it had shown itself previously. It is worth noting that it is, and to a very considerable degree, under the influence of treatment. Tonics, as a class, often lessen the number of the attacks, if they may be so described—so do stimulants, but the most decided effect is caused by altering the position of the patient. If we find the patient lying on his back, or half raised up in bed, and exhibiting this peculiar breathing, we have only to place him on his side, and it at once stops. What the cause of this is I am unable to say, but of the fact I have not the slightest doubt, having tested it again and again.

It is to be noted, too, that this breathing may go on whilst the patient sleeps; and this is a very important point. There can, I think, be little doubt that it is in such cases the patient literally dies in his sleep. Even whilst waking this kind of respiration, if it be of a very marked form, cannot go on without danger, and this just when the breathing seems to cease. When to this state sleep is superadded it will be at once seen how much the danger is increased. I was cognisant of one such case, and it was the patient's wife directed my attention to the fact by telling me the fright she at

would be much more common than it really is. I have frequently seen the vessel dilated, and yet there had been none of this peculiar breathing during life. Neither can I accept the elaborate explanation of the phenomenon given by Dr. James Little; but the question is too complicated to discuss further here.

first got by the peculiar breathing, at the same time describing accurately the breathing itself. When this breathing occurs, then, in sleep, it behoves us to speak in the most cautious way about the case.

In Simpson's Hospital the nurse has directed my attention to this symptom on various occasions. As it did not chance to exhibit itself when I was present, I might thus have very readily overlooked it, so that it is a symptom which should be sought for. I have had there three cases under my observation at the same time. In two private cases which I attended this symptom grew up, if I may so say, under my very eyes. In one of these it became very marked, in the other less so. In both I had very good opportunities of testing the effects on this peculiar breathing by altering the position of the patients, as already described.

Though this "Cheyne-Stokes" respiration is an important symptom, it has not the same value as many others, and for the simple reason that the disease is very usually advanced before it declares itself. In my own experience I have rarely seen it till within the last year of life. I am aware there are exceptions to this observation, but I only speak of what I myself have seen.

The symptom just described leads me to speak of the lungs and their state when fatty disease exists. These organs do not escape, and the heart being fatty, more particularly the right side, leads inevitably to the occurrence of bronchitis of more or less intensity. This state usually causes cough, but it is very remarkable that there may be considerable bronchial râles, and yet very little cough. In keeping with this observation I

have seen several cases where the patients complained of wheezing, as distinguished from cough, and which was quite sufficient to interfere with their sleep, and it is well to be aware that we may be consulted for this symptom alone. Hæmorrhage from the lungs in these cases is by no means of unfrequent occurrence, and should pneumonia set in it is almost certain to be attended with hæmoptysis—I mean as distinguished from the rusty sputa of the disease. There can be no doubt that when this form of bleeding occurs it shows that the blood-vessels of the lungs have degenerated. Like many other hæmorrhages, however, this one is not by any means as serious as it might at first appear. On the contrary, I have seen several cases and known of others where very marked temporary relief followed the hæmorrhage. As bearing on treatment this is a point worth keeping in mind.

In connexion with the present subject it must not be forgotten that the lungs, when fatty disease exists, become frequently œdematous, and the crepitus which this state causes must of course be distinguished from that of pneumonia. Ogle has shown that out of 25 cases of fatty heart very nearly one-half presented œdema of the lungs, so that this is a state for which we should seek, as the overlooking it would surely lead to disastrous results. In my own experience I have often met it, and I believe it is about one of the most frequent of the secondary consequences of the fatty diathesis. It can be conquered, too, for the time by treatment, at least in many instances, and the relief thus afforded is most marked.

It is worthy of note that the respiration is in a good many of these cases puerile, or approaches so nearly to this state that it is difficult to decide the point, and this may exist without any apparent lesion either in the lungs or heart—that is, there will be no bronchitis or pneumonia, nor narrowing of the orifices of the heart, nor dilatation of the cavities. I must say I am at a loss to account for this state, but it is quite possible it is analogous to what I have already described as occurring to the nares, and indicates there must be something wrong in the breathing or the mode of performing it. It is to be observed that when the "Cheyne-Stokes" respiration reaches its highest point the breathing is commonly puerile. This has been noticed by others.

The stomach is an organ which is rather frequently affected when the fatty diathesis exists. I do not speak here of the symptoms which so often present themselves when the gouty poison exists in the system, such as pain, flatulence, &c. It is of vomiting I would speak, and which sometimes becomes a very distressing and serious symptom. It is, however, late in the disease when it appears—at least this has been my experience of it. I do not know that I would have specially noticed it except that I happened to see a paper by Dr. Hayne, which appeared in *The Lancet* for January, 1875, in which he states that vomiting with feeble irregular pulse and pain in epigastrium are signs of fatty heart. He details some seven or eight cases of this kind, and gives the *post mortem* account of each, and in all the heart was found fatty or degenerated, the stomach being

healthy. The cases were all those of old men, and occurred in an institution to which Dr. Hayne was attached. On reading this paper I was at once able to bring to mind cases exactly similar which I had seen, though at the time I did not look upon them in the light in which this author did, but rather as a series of symptoms showing that the fatal end was near. Since then, however, I have met cases where, after a continuance of the symptoms for some time, they subsided, and the patients lived free of them till their death. On the other hand, I have known a first attack prove fatal at once; nor, indeed, when we consider the ages of the patients, and the severity and often the suddenness of the attacks, need we wonder at this result. On the whole, this paper of Dr. Hayne's is valuable, and I am able to confirm all his remarks, and consider that the state is one for which we should be prepared, even though it must be allowed to indicate a far advanced stage of the disease.

When the liver is fatty, as it very often is in this diathesis, it often gives rise to certain symptoms, which, however, can scarcely be said to be pathognomonic. Independent of slow digestion, constipation is very common. On the other hand, in a good many cases—probably a fourth—diarrhœa shows itself, and in a very troublesome form. The discharges are usually of a light colour, though not at all presenting the same appearance as we see in jaundice. I have seen them sometimes as if chalk were mixed through them, and have thought it possible this appearance was due to the state of the liver, but have not been able to satisfy

myself on the point.* The chief reason, however, for noticing the diarrhœa, when it occurs, consists in the danger which even a slight attack of it entails. It is very remarkable how much more it affects life than even a hæmorrhage will do, and it behoves us to be very cautious in our treatment of it. I have seen cases, too, where an attack of diarrhœa was or seemed to be the starting-point of the fatty diathesis—that is, from this forward the patient showed all the signs of this state. It is clear, however, that the diarrhœa was merely the spark which set the state going. It could not have done so in a healthy frame.

In connexion with the liver I may mention that should an attack of gall-stones occur—and with gouty people this is frequent—it is apt to be serious, or even fatal, and this is due to the state of the heart which then exists. Many years since a case of this kind got into the public papers, and made a great noise at the time. A gentleman had a very severe attack of gall-stones, for which he got large doses of opium, from the effects of which latter it was found most difficult to free him. He lived, however, eight days longer, and then died, and on examination the heart was found degenerated from fatty disease which had not been previously suspected.

In cases of the fatty diathesis the intestines very generally become sluggish, and constipation is the inevitable result. There can be no doubt their muscular

* It is often difficult to ascertain whether unhealthy discharges are due to the liver or intestines, and it is quite possible the kind I speak of may be due to derangement of the latter.

coat degenerates; but, in connexion with this part of the subject, the remarks already made about the state of the diaphragm must not be forgotten, and it is certain that the other forces which contribute to the act of defecation suffer likewise; and in this same category may be placed the bladder, for its functions are sure to be injured more or less, both from changes in its muscular coat and the forces external to the organ itself.

The kidneys are organs which are known to be frequently involved in the fatty diathesis. There is no more common site in the body for the fatty deposit than around these organs, and it will often be found here when it would little be suspected from external appearances. Besides this, the organs themselves may become fatty—a state which has been long recognised. In common with the subject of which I am speaking, I have only one remark to make, and this is, that when this fatty deposit exists it is apt to lead to suppression of urine. The functions of the organ are liable to be paralysed, as it were—just as occurs in other parts of the frame; but here it is almost inevitably fatal, and it behoves us to be very cautious in our inquiries on the point. All are aware of the great importance of the renal secretion in every disease, but in none is it more important than when the fatty diathesis exists. Our prognosis, I believe, may very often be guided by it; and if we find the urine increasing, after having been very scanty or suppressed, we may be almost sure of at least temporary recovery.

Like other organs the uterus is liable to fatty change.

There is no evidence, I believe, that fatty deposit ever takes place round the organ, and the change when it does occur is fatty degeneration. It is in such cases, as others have observed, that rupture of the organ is most likely to take place—just similar to what occurs in the heart, only not quite so fatal.

The state of the skin in this diathesis calls for a passing notice. Gouty eczema has been long recognised, and in my own experience is most frequently observed in fat people. In Simpson's Hospital I have seen, from time to time, some most extraordinary examples of the disease—I mean as regards the intensity and extent—and I could not doubt that the eczema acted as a safety-valve to the constitution, though the possibility of this is denied by some.

Speaking of the skin reminds me of one other point which is worthy of notice—I mean the state of the fingers and hands in many persons who are labouring under the fatty diathesis. I am not speaking now of the swelled joints and distortions of the hands so common in gouty people, but of a state where the whole hand seems to be wasted, and sometimes the arm too, the skin at the same time being red, often glazed, and frequently painful, or, rather, sensitive to the touch. Considerable loss of power attends it, and the whole hand conveys strongly the idea of its being like the claw of a bird. I was long familiar with this appearance before I became aware of its true significance; and it was only after reading the very valuable work of Mitchel that an explanation was afforded of the cause of this state, which, I may observe, can also be seen in

the feet and legs. In the work to which I have alluded many cases are given in which precisely similar appearances existed, but in these cases the changes were directly due to injury of the nerves by gun-shot and otherwise; hence the conclusion seems to me beyond any doubt that, in the cases I met with myself, degenerated nerves were the cause of the marked changes in the hands and feet.

In none of the cases I saw did the symptoms assume the great severity Mitchel has described in some of his. But this was scarcely to be expected. A direct injury to the nerve itself would naturally cause more severe results than when the nerve underwent degeneration, which commonly is a very slow process. The difference, however, between what I may here call medical and surgical cases would be only one of degree—not of kind; for of the identity of the two states I have not the slightest doubt. It is to be observed that Mitchel himself gives one case where the cause was from within; and it is well worthy of note that the symptoms were, in this instance, not at all so severe as in most of the other cases he gives. He also quotes Paget as having described cases of "glossy skin" long before he had done so himself. All Paget's cases, however, would come under the head of surgical cases, and paralysis was a prominent symptom in all. He avows, too, that though he believes injury to the nerves was the cause of the state he so accurately describes, still he had no absolute proof of it. The cases given by Mitchel now put this view of the matter beyond any dispute. The following case, which I have seen on several occasions

within the last two years, seems to me one of curious interest as bearing on this subject:—An unmarried lady, above sixty, and subject to gout as it shows itself in females, got a fall by which her left arm and shoulder were severely bruised. It was found that no bone was broken, as all the movements of the limb could be performed, if not by herself, at least by another. The accident occurred more than three years ago, and at first all seemed to be doing well. As time rolled on, however, it was observed that she was not regaining the use of the arm, and to this was shortly added pain, referred at first to the wrist and forearm, and then extending to the hand and fingers. It was for this pain I was consulted about eighteen months after the accident. There was no marked deformity when I first saw her, but there was much sensibility to touch, and it at once caught my notice that a slight touch produced much more pain than a firm one. Even when not touched, however, she had darting pains through the wrist and hand. Treatment seemed of no avail, and after seeing her six or seven times my attendance ceased. Being curious to ascertain her present state, after an interval of more than a year I visited her this day (Dec. 16, 1879), and found the disease had much progressed. The hand is now quite deformed, the forefinger being usually kept quite separate from the others, and when she attempts to bring the fingers together it causes her severe suffering, which she refers to the inner side of each finger. Besides these pains, however, she has also causalgia, and at times such a sense of distension of the fingers as is most distressing, and which, as she says herself, it

requires her sight to satisfy her does not exist. She is very much worse in the cold, and always keeps the hand warmly covered. The skin of the hand is not glossy, but it is exquisitely sensitive to the slightest touch, as it was when I first saw it. I observed that the fingers themselves quivered at times without her being aware of it. The whole hand might be described as being withered, and if she attempts to catch anything between her finger and thumb it is very apt to fall. The nails are not affected in any way. She can make no effort to shut the hand. It is to be observed that some of the joints of the right hand are permanently enlarged. There can be little doubt that, in this instance, the shock of the injury has led to some impairment of the nervous function, which has produced the state of the hand described.

This observation of my own—that is, the occurrence of cases of glossy skin in connexion with the fatty diathesis—is, I believe, one of very considerable moment, and now advanced, as far as I am aware, for the first time. I may state that, in all the cases I have seen, the evidence of fatty degeneration of a widely-spread character was unmistakable. If to this class of cases Mitchel's cases be joined, I think new light is thrown on some affections which otherwise would be very obscure. Thus, in the disease known as spinal arachnitis, which prevailed extensively in Dublin a few years back, I frequently observed, as others must have done, some joints attacked with a kind of arthritis of a very obstinate character; and again, eruptions on the skin were so common that it could not be doubted they were the

consequence of the state of the system induced by the disease. Now, spinal arachnitis affects profoundly the nervous structures—hence we have a direct connexion of cause and effect between the diseased nervous structures and the affections of the joints and skin described. Again, Alison has drawn attention to the fact that in some cases of hemiplegia affections of the joints are apt to occur, and that these only happen in the joints of the weakened side—showing clearly, as it seems to me, that the loss of nervous power is the main cause of these affections. Further still, in cases where the fatty diathesis prevails extensively, I have observed that such are very subject to attacks of inflammation, which on the skin assume the form of erysipelas—not, however, of the true kind, but rather of what might be called the half-developed disease, and which is always sure to be slow in its progress; and the same may be said of any other inflammatory affections which may occur.

The conclusion, then, to which these remarks would lead is, that the very peculiar disease known as "glossy skin" may arise from medical as well as surgical causes, and that amongst the former is now to be placed the fatty diathesis.

In the last place, I would make some remarks on the heart itself, and see how far its state may be diagnosed during life; and from what has preceded, it will be at once understood that I do not agree with those who consider an absolutely correct diagnosis cannot be arrived at. On the contrary I believe that, in some forms at least of fatty disease, the diagnosis is certain. As this part of my subject is of the greatest importance I shall,

even at the risk of repetition, go over some ground which has been already trodden; and, for the sake of description, would divide what I have to say under three heads:—

1. Fatty growth on the heart, unattended by any morbid sound.

2. The same state of the heart, but attended by a soft soufflet occupying the first sound, heard over the aortic valves, and often accompanied by cerebral symptoms.

3. True fatty degeneration of the heart, rarely accompanied by any morbid sound.

Of the first of these I have already spoken at some length. The state is essentially one of hypertrophy, and requires to be recognised as such; but it is an hypertrophy due solely to the growth of fat, from twelve to sixteen ounces being a very common weight for the organ to reach. In one aspect it is probably one of the most important forms of the disease to meet, and this arises from the fact that it is the most common. There will be occasion to advert to this part of my subject again when speaking of the prognosis. But, in relation with diagnosis, is this state of the organ one which can be recognised during life? I answer this question at once in the affirmative, and assert there are physical signs which confirm this opinion. In the first place, the heart being enlarged, percussion can be brought to bear; and though, as already stated, there sometimes are difficulties in the way, still they are not so great that by care they cannot be overcome. A second sign is the state of the pulse; and this is one which is very acces-

sible, for, owing to the increased labour thrown on the organ and the healthy state of the valves, the pulse becomes, almost as a matter of course, larger and fuller than in health. No one can fail to be struck with the change; and to such a degree has it sometimes gone that the impression has been left on my mind that some degree of hypertrophy of the muscle must have been present; nor at an early stage of the disorder would this be a far-fetched idea, for I am now speaking of a period when the health is or seems to be in full vigour. If the muscle be examined it is found to be perfectly healthy, but with the additional labour thrown on it (as there must inevitably be), a tendency to hypertrophy will result. I do not, however, put forward this point as determined, but merely as possible; but whether true or not, it is certain the pulse takes on the character I have described; and as long as the valves remain healthy the pulse retains its full character, even though it, at the same time, may convey the idea of weakness, which it is sure to do as the disease progresses. Some have maintained that fat on the heart, to the amount of three to six ounces, is quite compatible with perfect health. I cannot accept this view, for all my experience goes to show that in this state the tendency is to damage the muscular structure—first, by the fat insinuating itself between the fibres; and, secondly, by fatty degeneration. Whatever be the stage of the disease, however—and this is really the important point of which I am now speaking—the pulse retains its character of fulness to the very last. Hence, I believe this symptom to be one of very considerable importance; nor, as far as I am

aware, has it been noticed by any author.* Allusion has been made to the frequency of the state of the heart which causes it; and this is borne out in a degree by Quain's tables, who gives as many as 58 cases out of 83 where there was "fatty growth on the heart more than usual." But he makes no allusion whatever to the character of the pulse which I believe this state of the heart necessarily entails, and which I must repeat is so easily recognised. It seems scarcely necessary to add that this kind of pulse exists in the absence of all fever or sickness, for in some fevers—and notably in rheumatic fever—and smallpox the pulse presents often the same character; but it is not possible that any mistake could be made on a point of this kind.

When to these physical signs just described—I mean percussion and the character of the pulse—we add the state the patient usually presents, there can, it seems to me, be no doubt whatever that an absolute diagnosis may be made, and that the heart may be pronounced to be affected with fatty growth. It is to be observed that the state of the heart of which I have been speaking occurs at an earlier period of life than the true fatty degeneration. In my own experience there is at least a difference of ten years. Between forty and fifty is a common period for fatty growth, whereas fatty degeneration is most frequent after that. The exceptional cases which Ormerod and others have shown to occur in the young are too few to invalidate this statement.

* The distinction between fulness and strength must be kept steadily in view. In Quain's tables strength of pulse is represented by the figure 0, and this applies to the entire number.

The impulse of the heart is not in these cases necessarily weak; on the contrary, it may present all the appearance of health, but, if looked for, the apex beat does not give the same distinct impulse as is seen when the organ is healthy. To the hand, however, the idea conveyed is as if the impulse were more extended than natural. I have been often struck with this, and consider it to be due to the state of hypertrophy in which the organ is, and so in a degree analogous to the hypertrophy due to increase of the muscular structure.

When the stethoscope is used in these cases the two sounds are always to be heard, but in many instances they convey the idea of being muffled, and have not that distinctive character they afford in perfect health. In other cases, again, the idea conveyed to the ear is that of distance—I mean as distinguished from the normal state. On both these points, however, I would speak with reserve, and for two reasons—the first being that very great differences obtain even in individuals who are in perfect health; and, secondly, because the fat which is so commonly present in these cases on the pericardium, the inside of the intercostals, and the outside of the ribs, must offer a serious obstacle to the transmission of the sounds of the heart. For these reasons, any value to be derived in such cases from the cardiac sounds can only be a help, and does not approach that certainty which ought to attach to diagnosis. Even without this assistance, however, I believe I have stated enough to enable us to arrive at an absolutely correct diagnosis of the form of fatty growth of which I have been speaking.

For so far I have been supposing that the valves have not been involved, and that the fatty growth has existed *per se*. Nor can I too often repeat the fact that valvular disease is in all forms of fatty disease the exception, not the rule, and in proof of this would again quote Quain's tables, who out of 83 cases gives only 17 in which disease of the valves occurred. Still such cases are met; and this leads me to speak of the second division of the subject.

2. Fatty growth on the heart, attended by a soufflet, occupying the first sound, heard over the aortic valves, and attended by cerebral symptoms.

This state may be considered as more advanced than the one of which I have just spoken—in fact, valvular disease is superadded to fatty growth; but it is valvular disease, as already stated, of a peculiar kind, and so impresses itself on the morbid sound heard when the stethoscope is used, for the valve, though diseased, is perfectly smooth on its surface, and hence the soufflet is of a soft character, and in some instances hard to catch; and here it is that the plan already described can be followed, for by placing the patient in the horizontal position a doubtful soufflet becomes at once well marked. This fact, which I announced long since, is, I believe, of considerable moment, not only in cases where the heart is fatty, but in other forms of disease; and I have now had such repeated opportunities of testing its truth that I have not the slightest doubt about it, even though Balfour more than questions the fact.

Now, the peculiar combination of symptoms just described—that is, a soft single soufflet over the aortic

orifice, and at the same time what are known as cerebral symptoms joined with it—constitute the state on which Stokes diagnosed the presence of fatty heart. I believe this diagnosis to be absolutely correct. On the other hand, it has the serious drawback that it rarely exists, and hence its value is much lessened. Quain gives but four cases in his table in which a murmur occupied the first sound of the heart, and this out of a total of 83 cases; so that when the circumstances arise on which the diagnosis can be made it may be described as being quite exceptional.

The state of the aortic valves of which I have been speaking is not to be considered permanent, for as the disease advances ossific matter is deposited, both on the valves and specially in the arch of the aorta. It need scarcely be added that such changes will completely alter the physical signs, but to enter into these—even though so closely connected with the subject of fatty disease—would be quite foreign to the object of these remarks.

I now come to speak of the third and last division of this part of my subject.

3. True fatty degeneration of the heart, rarely accompanied by any morbid sound.

This division is in more than one sense the most important part of this essay. The numerous chloroform accidents which have occurred, whether connected with operations or otherwise, have been met in this class of cases, and what is of still more importance is the fact that the deaths took place after an examination of the heart had been made by the stethoscope, and the organ had been pronounced healthy. In the 50 fatal cases

given by Snow, examination of this kind is specially mentioned, and the conclusion arrived at that the heart was sound, and yet fatty degeneration existed, it may be said, in all. In one or two it seemed doubtful, or was in a very early stage. My conclusion is that chloroform is peculiarly dangerous in this form of fatty disease, yet some parties have denied this, but with these I could not for a moment agree; and, indeed, the way ether has supplanted the use of chloroform may be taken as strong proof that the profession now consider danger imminent when this latter agent is used.

But further, even when no anæsthetic has been used, sudden death is by no means uncommon in this form of fatty disease. It is, indeed, the form which, before all others, leads to the fatal event, and so frequently startles the public. The truth is, in such cases life is held by the slenderest tenure, and the very slightest causes lead on to death. In this aspect fatty growth is a much less formidable disease than fatty degeneration. Into the various causes which may directly affect life in these cases it would be needless to enter, more than to say that a slight exertion or mental emotion or straining, as at the water-closet, have all led to sudden death. I have observed, too, that it is peculiarly apt to occur after a meal, of which there are many instances on record. The effort to catch a railway train has frequently been the direct cause of death, and so of other exertions; and, lastly, I may again state that death may occur in sleep, and very probably arises then from the occurrence of the "Cheyne-Stokes" respiration.

It is also to be noted in this place that in many cases

of the true fatty degeneration the individual is thin, there being no signs whatever of any superfluous fat. I forget who it is has stated it is only in such parties the true degeneration is seen. But this is going further than facts warrant, for it is certain that marked degeneration is often met in union with fatty growth, and in my own experience I would say this latter class of cases constitutes the great majority of those met in practice. In these cases, too, a symptom of a general character frequently occurs, which I believe to be most significant—I mean a very marked loss of flesh, as it is called. The party has been fat, and remains so for a period which, of course, varies with the individual. But a time arrives when, without any apparent cause, he begins to lose flesh, and this may occur within a very short period. I repeat, this is a state of much moment to recognise. From the time it occurs the patient becomes much changed, and very seldom for the better. Such cases, I am sure, my readers are quite familiar with. But it is to their connexion with the fatty diathesis I would particularly direct attention, and the necessity which exists for not losing sight of this view of the case.

The last few remarks have been purposely introduced here because they lead directly to the question—Can true fatty degeneration of the heart be diagnosed? by which I mean here an organ where its muscular texture is altered, where there is little or no enlargement, and where valvular disease is the exception and not the rule. In this state I fear the answer must be a qualified one, and that of a negative character. Yet when all the circumstances of the case are taken into account, it will

be allowed that a diagnosis may be arrived at which is all but certainty. It wants, however, that certainty which other diseases like pneumonia, pleuritic effusion, or pericarditis afford, and, it is to be feared, will ever want it. For the sake, however, of describing such symptoms as may help in forming a diagnosis, I would divide them into general and local. Of the former most have been already given, and are common to all the forms of fatty disease, and, except to name them, need scarcely be further described here. The look of the patient,* the arcus when present, the greatly diminished powers of keeping up the animal heat, the flabby state of the muscles, and the marked loss of strength, are each and all symptoms of this state. This latter sign is often more marked than the others, applying to both mental and bodily powers, and I have seen it when it seemed to be almost the only symptom present. There is one way in which this loss of strength shows itself, which is worth noting, and of which I have seen different instances—I mean where females lose the power of fixing their hair; the elevation of their arms for this purpose is at once followed by a sense of faintness, which forces them to desist. I have no doubt the same would occur in males, were they similarly employed. In one instance I saw it seemed to be the first symptom the patient complained of, and for the last two years of her life the patient never attempted to raise her arms above her head.

* When the countenance exhibits those other signs of which I have already spoken, it is certain the disease is very much more advanced, and can scarcely then be overlooked.

The pains the patients so often complain of—and especially close to the diaphragm—are also general symptoms, worthy of particular attention, and, in my own experience, have been of frequent occurrence. When these pains are present, they are always, as has been just stated, significant, for they show that the fatty diathesis is general, and hence much more serious than if they did not exist. Pain in the region of the heart itself is by no means uncommon, and it is often hard to say whether it is in this organ or the intercostals. I have no doubt the heart is frequently the seat of it; and it certainly conveys the idea that fatty degeneration is closely allied to one of the forms of inflammation. That pain of this kind is often a direct symptom of fatty change, I am quite sure of, and, when questioned, patients often admit it. In some it is only a sense of uneasiness which is complained of, whilst in others it seems never to exist at all. Quain gives 19 out of 83 cases where the pain was long continued. It is ever a symptom which is to be sought for, and, in my own experience, has been much more common than in the table just quoted.*

Dyspnœa is a symptom which may fairly be classed amongst the general signs of fatty disease, and it is one of great frequency. Quain gives it as occurring in one-half of his cases, and I think he is under the mark; but it is very curious how many do not seem to be

* The upper region of the chest is a very common part to which pain is referred. When an attack occurs at night, it is here the patient complains, and describes it very commonly as a sense of choking, which, as the disease progresses, becomes more and more permanent.

conscious of its presence, and will not allow to it. Probably three reasons exist for this. In the first place, the onset of the dyspnœa is so very gradual that the system gets accustomed to it, and we know what habit does in such cases. In the second place, a kind of instinct deters the patient from trying his breathing, and it is only when a sudden emergency or exertion arises he discovers he is short of breath. This I have known to occur. And in the third place, there is a great variety in the degree to which the fatty change has advanced, as well as the special organs affected. I have already spoken of the diaphragm, intercostals, &c., and we know as a fact that these may be fatty whilst the heart itself is comparatively or absolutely healthy, or *vice versâ*. The heart may be the organ alone affected, and even here dyspnœa is in my experience very much modified by the side attacked; I do not mean that one side can be healthy whilst the other is degenerated—such a state, I believe, has never been observed, but simply that whilst both sides are involved one may be much farther advanced in the disease than the other. There are, too, few statistics yet bearing on this point, but the general opinion is that the left side is more frequently degenerated than the right, or at least farther advanced—that is, if we suppose one side to be farther advanced than the other. But it must not be forgotten that in cases of fatty growth the deposit takes place very generally on the right side, leaving the left side free, whereas when fatty change occurs it affects both sides at the same time, though one may be farther advanced than the other.

Now, when the left heart is most affected cerebral symptoms take the lead, and I believe by this knowledge it is quite possible to arrive at a correct diagnosis. The symptoms are more general, it being the systemic heart which is engaged, whereas if the right heart be most involved the symptoms are referable to the lungs and breathing. In Simpson's Hospital I have often found these differences to exist, even whilst admitting that many instances occur where both sets of symptoms are present at the same time—in other words, both sides of the heart are equally diseased. In a practical point of view it is, however, always of consequence to separate the two classes of symptoms, when such is possible. When I come to speak of treatment this part of the subject will again be discussed.

If the right heart be the most involved there is a physical sign I have often observed which it is of consequence to note—I mean puerile respiration. I am not speaking of a temporary state of this symptom, such as may be heard in the "Cheyne-Stokes" breathing, but of a permanent state of the sign, and this without any apparent cause to account for it, such as pneumonia or effusion into the pleura. It is right to add it is not always present, even when other circumstances might lead one to expect it, but when present it becomes a very valuable sign, and points, I believe, always to the existence of cardiac mischief, chiefly of the right side. It was, if I recollect right, Andral who long since drew attention to this sign as an early symptom of heart disease. It is of its connexion with fatty heart that I would now speak. It always reminds me of a symptom

of which I have already spoken—I mean dilatation of the nares, and conveys the idea, whether rightly or wrongly, that something must be wrong.

The pulse of fatty heart is a symptom about which a good deal has been written, and of which I have already had occasion to speak. For the sake of description I may here divide it into three forms—the slow pulse, the natural pulse as regards frequency, and the rapid and intermitting pulse. The first of these has attracted the most attention, and, as is known, many cases are on record where a slow pulse was the leading feature. By slow pulse I here mean one beating below 50 in the minute. That it is a symptom, a most important symptom, of fatty heart, does not admit of doubt, but like other signs of this state it is not by any means a constant sign. Quain gives 8 cases out of 83 where it existed—that is, about 1 in 10 presented this character of pulse; but it may be assumed as certain that in numerous instances the heart is fatty without the pulse being affected by slowness. In the consideration of this part of my subject it must not be forgotten that functional causes, or what we assume to be such, may cause the pulse to become slower than in health—in other words, a slow pulse is not of necessity permanently so. I myself have put on record a series of cases of fever in which, during the height of the attack, the pulse fell to 50 and even 40 in the minute, and then as the illness passed off the pulse rose again to the healthy standard. Again, in many cases of jaundice it is common for the pulse to fall below the normal beat, and also in some cases of lead poisoning, whilst in one of the stages of

hydrocephalus very slow pulse is almost a constant symptom. Injury, too, has directly caused the pulse to get slow; and there are numerous instances on record where, after the spine had been shaken or directly injured, the pulse beat at a very slow rate. Physiology has likewise confirmed this point, for we know that certain agents, and prominently amongst these galvanism, applied to the par vagum will cause the pulse to become slow, and it is from this fact that some physiologists have named certain nerves inhibitory—that is, as having a direct controlling power over the action of the heart. It would seem, as already stated, that the right par vagum has a much greater power over the motions of the heart than the left. Masoin, of Louvain, is the authority for this.

These considerations are of some moment, and have a direct bearing on the slow pulse of fatty heart. Most of them have already been advanced by others, for they go to prove the direct influence which the nerves have over the movements of the organ; and when we meet fatty heart and slow pulse combined, the conclusion seems irresistible that some change has occurred in the nerves supplying the organ; and as we know—and, indeed, it has been already stated in this essay—that fatty change plays a very leading part in diseases of the nerves generally, my conviction is that the slow pulse of fatty heart is directly due to fatty disease of the par vagum or some of its branches. Some writers, I know, have held a similar opinion—that is, as attributing the slow pulse to nervous influence, but I consider we may now go a step farther, and connect directly the slow

beat of the heart with actual organic disease of the nerves themselves. I may state that in several instances the symptom of slow pulse has grown up, if I may so express it, under my own eye, nor does it require a long time to cause it. I have seen it developed, and to a marked degree, within a year—that is, a pulse of which the habitual beat was close to 70, has fallen to 50, or even below this, remaining permanently so. The more rapidly a change of this kind occurs the more serious the case is, for it shows that the causes are being more quickly developed. I have met it both in cases of fatty growth and in those where the true degeneration existed, but I rather think the most marked examples of it occur in the latter, and more particularly where the patient is thin and pale. In determining its presence we must not trust to the pulse at the wrist alone, for here there may be intermissions which are capable of leading us into error. The slow pulse, however, of fatty heart has not in my experience been usually attended by intermissions, but simply by slowness; and I would go so far as to say that if there be intermissions the pulse rarely falls in a marked degree. Under any circumstances the stethoscope applied over the heart must alone determine the presence or absence of slow pulse. It seems scarcely necessary to add that some parties have constitutionally a pulse below the average beat, but it is barely possible to make a mistake in a case of this kind.

In connexion with slow pulse there is often, I may say always, a state which is worthy of noting—I mean what may be called sedateness. This pulse is very

characteristic and very common, and, indeed, from the state of the heart we might almost expect it. It is to be noted, too, that it is not confined to a pulse of 40 or below it, but is quite manifest even at 70 or 80. It is, of course, plainer when the pulse at the wrist is large, and then it can be felt passing under the finger like an undulation, coming up on one side and passing away on the other. This pulse is totally different from the beat given by a healthy heart, and I would add that if the pulse be large it is a sign which it is not possible to overlook. It is particularly worthy of note that in those cases where the pulse is slowed from functional causes, to which I have already alluded, this state is not observed; on the contrary, it is what the French express by the word *vité*.

When an individual having the slow pulse of fatty heart happens to be attacked with any inflammation—say pneumonia—the pulse rarely rises above 90, but even this is a state in which the danger to life may be great, and if it then rise to 120 the case may be looked on as hopeless. This has been already mentioned, but it is a point worth restating.

The pulse in fatty heart may be intermittent, and this may vary from the slightest difference in the strength of the beat to a complete intermission.* My own experience does not make intermission in any degree a

* It would seem to be a very general impression that fatty heart was often attended by an irregular pulse, but the numbers given go strongly to disprove this. As stated in the text, however, matters are very different when anything of valvular disease of the ossific kind exists, or contraction of the left auriculo-ventricular opening or dilated cavities.

common symptom, and I find Quain gives but 17 cases out of 83 of irregular pulse. Neither does my experience lead me to consider an intermitting pulse as of much value in a diagnostic point of view. I am now speaking of those cases where fatty disease alone exists. In such there are good grounds for believing that the degeneration begins, as it were, within, and that the chordæ tendineæ and neighbouring parts of the ventricle are amongst the first to change, and this change it is that accounts for the unequal beats of the pulse. I believe when the opportunity is afforded us of observing a pulse that we knew to have been equal becoming unequal, it is a symptom of degeneration. But such opportunities are not common.

I have said that functional causes may produce slow pulse, but this is still more common of irregular pulse, as everyone knows. Attacks of indigestion will cause it, and particularly where anything of gout is present. I have often met it in the earlier stages of fever, and, of course, later on if the case is about to be fatal. Besides these, however, there are organic diseases of the heart in which irregular pulse is very common. Amongst these may be specially named valvular disease and dilatation of the cavities. In both of these irregularities of the pulse are very common, and, as I believe, of much more consequence in a diagnostic point of view than when the heart is purely degenerated from fatty change. The pulse, too, as is well known, may be by constitution irregular, under which circumstances, when serious illness occurs, the pulse loses this character, but regains it again as health returns. For all these reasons, then,

I would place irregular or intermittent pulse far below slow pulse as a help in diagnosis. When, too, fatty change does occur in union with dilatation or valvular disease—and this is a common state to meet—I believe the irregularity of the pulse is more due then to these diseases than to the fatty change; and the figures just given go to support this idea, by showing how comparatively rare irregular pulse is in fatty heart itself.

The character of the pulse as regards strength calls for a passing notice here. It might almost be assumed that the state of the heart would necessarily cause a weak radial pulse, and so I believe it does, provided the left ventricle be the portion of the organ affected, and that the change be of the nature of degeneration, as distinguished from fatty growth. This latter state, as already mentioned, gives rise to a large full pulse which might easily be mistaken for health; yet even here a close study of it shows it is not so, and the very largest pulse will, as a general rule, be found compressible. I say as a general rule, because in some instances at an early stage of the fatty growth the pulse really conveys a true strength, as if there were a real hypertrophy of the muscular structure present. But such cases are exceptional, and it must be repeated that the radial pulse in fatty heart is very commonly weak and compressible, so that when a slight compression is used the beat is quite extinguished, and does not reach even the side of the finger next the heart. If, however, the coats of the artery be rigid—and this is not very uncommon—the pulse cannot, of course, be studied at all to the same degree, and other signs must then be taken

into account. There is another means of trying the strength of the heart, which consists in elevating the arm either whilst the patient is lying in bed or sitting. This plan often discloses the fact that the heart is weak by the difference which is then to be observed in the pulse, and it reminds one of the statement I have already made that a female with a weak heart may be totally unable to do up her hair. When such occurs it may be fairly concluded that the left ventricle is at fault. Speaking of the pulse being weak reminds me, too, that some parties have naturally a very weak pulse; still, though it may be hard to catch, and in one sense very weak, to anyone who studies it there is a totally different impression conveyed to the finger from what occurs when the left ventricle is fatty. Besides, we have very constantly a number of other signs when fatty heart exists, all of which go to prove the cause of the weak pulse.

In noticing this part of my subject it must not be overlooked that the fatty degeneration may and does affect a part of the heart where the study of the pulse is not available—I mean, of course, the right side, which we know may be degenerated in a much greater degree than the left, and necessarily capable of affecting life, and in a very sudden way. In such, as I have said, the radial pulse does not assist us, and our diagnosis, if it can be made at all, must depend upon other symptoms.

And now as to the examination of the heart itself by the stethoscope and other means—how far does our diagnosis extend? Is it possible to make it certain? I believe it is, and that in most, if not all, cases accuracy

can be attained; and I consider that Quain, Stokes, Walshe, and many other eminent writers, have been too cautious in the opinions they have advanced on this point.

As the first and easiest form to diagnose I would place that of fatty growth, into which it is quite unnecessary to enter again, except to recognise the fact that the heart being enlarged gives rise to an increased dulness on percussion, and also a very characteristic pulse. When these are present the diagnosis may be confidently made that fatty growth exists, nor can I find that any author has made similar statements. It may be added that this is the most common form of fatty disease that is met, and is usually seen at a somewhat earlier period of life than the true fatty degeneration. That it often runs into the second form of the disease seems to me certain, and in this aspect it may be considered but an earlier stage of what is to follow.

In the second form we have what Stokes has described—that is, slight valvular disease, usually of the aorta, giving rise to a soft bruit, occupying the first sound of the heart, and to this superadded what are known as cerebral symptoms. When such a combination exists I believe a positive diagnosis may be made—the objection to it being that it is rare to meet this state.

It is in the third and last form of the disease that the real difficulties in the diagnosis seem to me to arise, for here we have no enlargement of the organ, and valvular disease is, to say the least of it, exceptional. Can this state be diagnosed? I believe it can, even from the local physical signs, and I think that too little weight

has been given to them in this important question. It is true one word will express them all, and that is weakness. But what then? When the lungs or a portion of them give a weaker respiration than is common in health we never hesitate to say it indicates disease. Why should it be different with the heart? In the course of my own investigations on the point I have found that the beat of the organ is essentially weaker than that of a healthy heart. This, of course, varies with the degree of disease present, but it is equally plain whether the stethoscope be applied or the points of the fingers. It may go on, too, to the total extinction of the beat, no matter what plan we may pursue to elicit it. As the patient lies on his back it is common to find no impulse whatever, but if we then make him sit up, and still more if we ask him to lean forward, any beat of the organ that may exist will then be made evident. But, as I have just stated, the beat of the heart in some cases becomes literally extinct. In some instances I have observed the kind of vermicular movement which has been described by Stokes. It seemed to me to belong to those cases where there existed also a slow pulse, or even a tendency to it.*

In connexion with a weak impulse I may speak of the sounds of the heart, which I have no hesitation in

* As bearing on this point I find that the movements of the heart while in health are described as being vermicular. These, however, are so rapid as to be difficult of observation; but if we suppose the heart to become very slow in its beat, or even with a tendency to it, we can then understand why the vermicular movement should become more obvious and, as it were, analysed. Look on it as we will, the observation in the text is worthy of Stokes.

stating afford in the great majority of instances valuable assistance in arriving at a diagnosis. Weakness of the sounds is the characteristic change from that of health, and I have seen cases in Simpson's Hospital where it was next to impossible to catch the sounds, even when the patient held his breath. When they become indistinct in this way I have found them usually clearer on the right than the left side, but, of course, in most instances both sides give weaker sounds than in a state of health. It is worthy of note that, even when the pulse beats 70 in the minute, the sounds conveyed to the ear give the idea of slowness, which becomes very much more marked if the pulse happen to become slow.

There are one or two modifications of the cardiac sounds which may be noticed here. In some cases, so far from their being weak, they are very distinct, and convey a musical ring to the ear. This is a totally different state from where a bruit exists, and is certainly heard when no valvular disease is present—besides, too, it occupies both sounds. I am not sure on what it exactly depends, but from what I have seen I would say it is met where the patient is thin and has very little of fatty covering over the thorax. The heart itself seems to be, if anything, under the normal size, and the valves are thinner than in health. I believe when the heart-sounds give a distinct musical tone of this kind that true fatty degeneration of the organ exists. Whether it is heard in the form of fatty heart described by Wilks I cannot say—I mean where anæmic symptoms are predominant. I would expect the cardiac

sounds to present the musical character in such cases, but I have seen too few of them to be able to give an opinion on the point.

A second modification of the sounds is where they are wonderfully like those of the fœtus *in utero*, not only in character, but even in frequency. In such cases the two sounds, though perfectly distinct, convey to the ear the idea of smallness,* and, I may add, of distance, and at the same time the beat of the heart is always above the healthy standard. I have seen it keep persistently at 120. It is curious these cases may go on with very little derangement of the general health. They are, of course, exceptional, and I mention this because they only occur, as far as I have seen, in cases where fatty growth both externally and on the heart is present. Now, in such cases, according to what has gone before, the pulse should be large, and so it usually is; but the cases of which I now speak are, I repeat, exceptional, and the only explanation I would offer is that it is due to idiosyncrasy. At any rate, however we may explain it, these cases are very marked, and when once recognised cannot be overlooked. I do not put them forward so much in a diagnostic point of view as that they are a class with which we ought to be familiar.†

Speaking, then, of the physical signs, which in these

* These sounds might be compared to print of the smallest and clearest type.

† Sir Thomas Watson, I find, refers to a case where on three several occasions the heart was found beating at 216 in the minute. There was great distress and anxiety attending this state. In the fourth attack the patient died, and a large flabby heart was all that was found.

cases may be derived from the state of the heart itself, I believe they are quite capable of affording a correct diagnosis, and that when the pulse, the percussion—whether positive or negative—the absence of impulse, and the modifications of the cardiac sounds, are all taken into account, the conclusion is as certain as the nature of the subject admits. That cases will and do occur where the diagnosis is uncertain may be admitted, but with our present knowledge such must be very exceptional; and I would repeat that authors preceding myself seem to me to have given too little weight to the changes in the sounds of the heart which have been described. These abnormal changes have been spoken of by others.* But I think the time has now come that a greater value must be accorded to them. Are there any other causes, I would ask, which would lead to such a weakening of the sounds as occurs here? The only state which at all approaches it is where liquid effusion into the pericardium has taken place, but in such it would not be possible to commit an error in diagnosis. As to cases of dilatation of the cavities, or weakening of the muscular structure of the heart from other causes than fatty disease, I omit them here, because such states have come so very rarely under my own observation as not to entitle them to be brought into this question.

It would be quite foreign to my intention to enter further here into what might be called the complications which are met in fatty heart. I shall only repeat of valvular disease—I mean when it assumes the osseous

* See especially Hayden's elaborate work, in which the varieties in the sounds of the heart, as occurring in fatty disease, are ably described.

form—that I believe it is very commonly secondary in time to the fatty change. Whether osseous growth and fatty change are but different stages of the same disease, I shall not take on me to determine; but I believe, often as they are conjoined, that the two do not appear at the same time, and that, as just stated, it is the fatty disease which takes precedence of the other. In the arch of the aorta I think there can be no doubt of this, for here atheroma *per se* is very common, but osseous scales alone very rare. That fatty disease may follow valvular disease is, of course, certain. I believe it, however, to be rare. When the two are conjoined, the symptoms during life will of necessity be modified. As far as I have observed, there is in such more of actual pain than if fatty disease existed alone. But, as I said, I cannot pursue the subject further here.

Before concluding this chapter there are a few points of a general character which I would notice. Any reader of what has preceded cannot fail to have been struck with the views I hold on the subject of fatty disease. The affection, I believe, is very rarely a local one. In other words, when we speak of cases of fatty heart it must be understood that in the vast majority of instances other parts of our frames and organs are affected at the same time. Hence, in discussing this disease, it is essential that we should look upon it as arising from a diathesis, rather than as a local affection. It is quite true the heart may be, and often is, further advanced in the disease than other parts, whilst its functions are of such importance that any impairment of them affects life more directly than is the case with

other organs. Still this does not alter the views I advance—that fatty heart is very commonly but a symptom of a general state of the whole system. Looked at from this point of view, it need not surprise us that we are constantly meeting cases where it is symptoms elsewhere than in the heart about which we are consulted. I have spoken of this before, and specially in reference to the brain. I have seen a number of such cases, where there were not only cerebral symptoms which had first attracted the patient's attention, but on closer investigation I found that the heart itself was diseased. The truth is, the changes which go on in this organ in fatty disease are very often latent—or, at least, they do not attract the patient's attention; and it is only when some cerebral symptoms—such as double vision, or giddiness, or temporary paralysis—occur, that we are consulted. I have very good reasons for thinking that this class of cases is not yet sufficiently recognised. One case has already been given at considerable length, where the author seems to have been quite at a loss to account for the symptoms; yet they were all those of the fatty diathesis, as was proved by the *post mortem* examination. The medical periodicals, too, frequently afford similar instances—the cases being advanced as examples of disease of the causes of which the writers were ignorant. I have noted cases of this kind again and again,* yet,

* Thus, in the *Journal of Mental Science* for July, 1879, a case is given where "fatty embolism of the vessels of the lungs was found in an epileptic, who died comatose, after a succession of fits. In this instance the heart, liver, bones, lungs, and brain, all presented fatty

though the heart in all is described as being fatty, the authors seem at a loss to account for the death, or to connect it with the morbid changes found. I cannot doubt that many persons die of cerebral symptoms which are never suspected of being but a part of the fatty diathesis. The famous Dickens I believe to have been an example in point. Any one who reads the account of the last two or three years of his life, as given by Foster, cannot but have observed that he was struggling against a failing heart; and yet this idea scarcely seems to have been entertained, or at least it is not mentioned in any direct way. Dickens himself speaks of his heart failing, and on different occasions he required powerful stimulants and a period of absolute repose to enable him to go through his readings. At times, too, he had symptoms of angina pectoris. But none of these seem

disease." It is not, however, as a diathesis the author speaks of the case—and yet it was surely entitled to this term—but as an example of fatty embolism of the vessels of the lungs. But, again, I take the following from Dr. Billings' able work (the sixth edition). He is speaking of cases of apoplexy and paralysis, and thus expresses himself:—"One point to which I particularly wish to direct the attention of the practitioner is, that there occurs in old people a paralysis from mere debility of the nervous centres, without either inflammation, softening, tension, rupture of vessel, or other organic injury, and which will appear sometimes on one side of the body, and again on the other. These cases will recover under gentle and judicious attention to the constitution, and by careful support and tonics. I have treated many in this way, and have effected their recovery from paralysis, which was thus proved to have depended upon temporary local congestion, for when they died of other diseases no organic disease of the brain was found." The author, too, speaks in another place of the pulse being very weak. It would not be possible to give a more accurate description of the paralysis connected with fatty disease of the brain than this.

to have attracted any special attention to the state of his heart. In the same way I might speak of other similar cases, and may mention that I have myself seen several instances where the symptoms were referred to other parts than the heart itself. But it is not necessary to pursue the subject further here.

If the views of which I have just spoken be correct, some very important conclusions follow from them. Thus I believe the disease known under the name of "pernicious anæmia" to be neither more nor less than one of the forms of fatty disease. I rather think this idea has been broached by others, though I am unable to say by whom. On my own mind there is not a shadow of doubt of it. It will be recollected that in this form of disease the fat, so far from disappearing, as one might expect it would, seems always to remain, if it do not indeed increase, and with this state the heart has always been found degenerated. The state of the marrow in the bones only confirms this view, and it appears to me strange that any special causation should be attributed to it. To myself it appears but a part of a general or, I should rather say, a universal change in the whole system. It is in cases of this special disease, I believe, that the heart is most apt to be found under the normal size, and the valves almost always healthy. It is, in fact, the purest specimen of fatty disease that is at present known. The term "pernicious" indicates, I rather think, what would be understood as an acute form of the more common disease, "anæmia."

Whether there be any connexion between Addison's disease and fatty disease I shall not take on me to deter-

mine, but the author himself notices that in most of his cases the patients retained their fat.

In the last place, and in connexion with this part of my subject, the question arises—What is the nature of the affection known as the general paralysis of the insane—is it a fatty disease? I believe it is essentially so. The implication of the mental portion of our being does not seem to me to alter the question in the least. The only difference is as to the time the mind becomes affected. In the paralysis of the insane it is a very early and prominent symptom, and the paralysis becomes then superadded to the diseased mental state, whereas in the ordinary forms of fatty disease other symptoms than those connected with the mind take precedence, and then the mind becomes involved, but very rarely, if ever, to the same extent as in the paralysis of the insane. I need scarcely say that the morbid anatomy of this last disease seems to have the closest connexion with ordinary fatty disease, and that it is very common for insane patients labouring under paralysis to become very fat. On the whole, the question of the connexion between ordinary fatty disease and the general paralysis of the insane seems to me one of much importance, and worthy of more consideration than it has yet received.

Does any connexion exist between angina pectoris and fatty heart? Not necessarily, I believe. In its well-marked form it is a very uncommon disease, and much less frequent than fatty heart. Out of Quain's 83 cases angina pectoris is not mentioned as occurring more than eight times, and my own experience is almost

of the same kind.* That it may be a functional affection is certain—in other words, after having presented itself in a well-marked form, it has ceased sometimes of itself, and in other instances as the result of treatment. Some writers, too, have divided the disease into functional and organic. I have seen it myself, and in an exquisitely marked form, more as a functional than an organic disease, and in all my own cases it seemed to have the closest connexion with gout; nor do I think there is any difficulty in understanding why gout, or rather the gouty poison, should cause it. We know it is capable of attacking any part of the frame, causing either pain or spasm, as the case may be. It certainly often attacks the lungs, and why not the heart itself? Does anyone doubt that the intercostal muscles are frequently attacked, and sometimes, but more rarely, the diaphragm? We have the high authority, too, of Sir James Paget for stating that gouty people are very subject to cramps in the limbs. With such facts in view the heart could scarcely escape, and possibly the wonder is that it is not more frequently attacked. Many causes have been set down as giving rise to angina pectoris. Amongst these has been spasm, and I believe that this view affords the best explanation of the symptoms, to say nothing of the effects of treatment—I mean when the attack is on, for then one or other form of anodyne antispasmodic usually affords the most decisive relief, which, it is to be observed, comes quickly,

* This would give one case in every ten as affording an example of the disease. I have not met it in this proportion, and rather think angina is more common in England than with us in Ireland.

and just as quickly ceases. In a case which I had a very good opportunity of observing, inasmuch as the patient was a servant of my own, the suffering was exquisite, the attacks being very sudden, and always occurring at night. The patient was close to seventy years of age and fat, and had, under my own eye, several attacks of very well-marked gout. Except that she had fatty growth on the heart there were no signs at this period of either valvular or aortic disease. She lived many years subsequently without suffering from any attacks of angina; and when she died Dr. Minchin kindly obtained her heart for me, and it was found by Mr. Foy to have rather more fat than natural at the same time that degeneration had occurred, but there was neither disease of the valves, nor of the aorta, nor coronary arteries.

It may, I think, be accepted that angina in its most exquisite form can occur without any organic disease, nor does the presence of organic change necessarily cause angina. Both in Chalmers and Abercrombie the coronary arteries were extensively diseased, and the heart likewise, yet neither ever exhibited symptoms of angina. On the contrary, in John Hunter's case these arteries were very much diseased, and he was known to have suffered from angina many years before his death. He died, too, in a fit of this disease. I would repeat that, whilst disease of these arteries and fatty heart are very common, angina is very rare, so that the conclusion is, I think, irresistible that there must be a something else to account for the disease. That organic changes, and more particularly fatty degeneration, may

predispose to angina, few, I think, will be inclined to deny, but further than this, and with our present knowledge, it would not be prudent to go. When speaking of treatment, further on, this subject will have to be resumed.

It need scarcely be added that in many instances symptoms like angina pectoris declare themselves, and may be seen in cases where aneurism close to the heart exists, or disease in the aorta itself, or even in valvular disease, but such cases do not exhibit the true disease—they are angina-like, but not the real affection.

CHAPTER III.

ON THE PROGNOSIS.

ANY remarks on this part of my subject may be very brief. Once any symptom of fatty disease shows itself it may, I fear, be assumed that a complete cure is not to be expected. But a very wide space exists between a disease of this kind at its commencement and termination; and over all this space, which may occupy years, our prognosis must very generally depend on the symptoms actually present at the time we see the patient. A case which first attracts notice by the presence of cerebral symptoms, of which I have already spoken, at once shows us we have a serious disease to meet. Many such run their course within a year, whilst others occupy three or four. The presence or absence of arcus makes a material difference. If it be present, and the heart too be engaged, the same rule will hold. The degree which the arcus exhibits will, of course, regulate our prognosis as well as its rapid growth; and I rather think it is the worst form where the arcus is whitish and then mottled and broad. I would consider a case where the arcus had preceded any symptoms referable to the heart as more serious when this organ does become engaged, being

more likely to run a rapid course. This would show progression, just as the appearance of the arcus would, after the heart itself had been affected. It need scarcely be stated that the more extended the signs of fatty disease are the more serious is the case. Thus, if the liver be involved, or the kidneys, or the radial artery be corded, or if the pectoral muscles or the diaphragm show degeneration, or if the cartilages of the ribs be ossified, the case must always be looked on as more serious; or, again, if there be valvular disease or dilated aorta. But, in truth, the varieties are so numerous that this part of my subject can only be spoken of in the most general way.

It has been already stated that any acute attack becomes a most serious matter when the heart is degenerated, or even when only affected with fatty growth. Fat people bear fever very badly, especially typhus. When attached to the Cork-street Hospital, a large number of brewers' men came under my care—almost all being fat. I would be afraid to say what the mortality was. It was, however, very great. But, indeed, the same remark may be made of any of the specific fevers, such as scarlatina or smallpox.

The surroundings of the patient have a most important bearing on our prognosis in fatty disease. If these be favourable it is very remarkable how long life will go on—even when it hangs on the finest thread. I am free to confess I have made some grave mistakes in prognosis—I mean as to the length of time a patient would live. More than one has survived for months after I thought that a few days must have ended the scene.

In no other form of cardiac disease is life, I believe, so much prolonged; and in saying this I am quite aware of many cases where serious valvular disease of both the aortic and mitral openings, with its consequences, existed, and yet where life was wonderfully prolonged. But, even granting this, cases of fatty disease—especially degeneration—occur which are still more remarkable; and thus is explained the numerous cases on record where the marvel was how life could go on at all. I have no doubt it is the comparative freedom from valvular disease which mainly accounts for this; and, there being no obstruction, the circulation goes on, if I may so say, smoothly. Between the two states of which I am speaking—that is, fatty degeneration and serious valvular disease—there is a great difference as regards the suffering, for there is very much more pain with the latter than the former, and this accounts for the number of sudden deaths which occur from fatty disease, and yet where there had been no premonitory symptoms.

Our prognosis, then, will be very much modified by the surroundings of the patient being favourable or otherwise.

In those cases were both fatty and valvular disease co-exist, our prognosis must, of course, be modified accordingly. They entail great suffering.

Of the two forms of fatty disease—fatty growth and fatty degeneration—it is scarcely necessary to say the former is, by many degrees, the less dangerous state. Indeed, in many of them the individuals seem to be in perfect health, and capable of all the duties of life, and

some writers have thought they were so.* For reasons, however, which have been already stated, I would not go so far as this, nor look upon them as being, in the strict sense, healthy; and if their lives were to be insured an additional premium should, I consider, be paid.

It has been already stated that a very important element in making our prognosis consists in the fact of whether other parts of the frame are affected with the heart itself, and as bearing out this I have often spoken of the brain being frequently so affected. But there are other parts which very constantly become involved—of these the blood-vessels are an example. Having spoken of them before, I need only say now that, when diseased, they add much to the gravity of the prognosis, and so of other parts, such as the kidneys, liver, and, above all, the diaphragm, to which latter part I have already drawn special attention, both on account of the importance of its diagnosis when diseased, and the great and continuous suffering which this state entails.†

There still remains a point bearing on prognosis which, though noticed before, must be spoken of again—I mean temperament. I do not pretend to explain in what this consists, but in its results it is very striking, and cases apparently similar run a very different

* Dr. Arnold went through arduous work within a very short period of his death, yet his heart presented a striking example of what is described in these pages, being somewhat enlarged and degenerated, but the valves healthy.

† A celebrated Scotch divine, not long dead, and whose case is alluded to in Gairdener's very able article in "Reynolds' Medicine," had, I believe, a degenerated diaphragm as well as heart.

course, and more particularly as regards their duration. The surroundings will be the same, and the physical signs very similar, and yet the duration of the two cases will present a marked contrast, for which it is hard to account. One yields readily to the diathesis, whilst the other resists to a degree which makes the case much more enduring. A recognition of this fact is all that it is necessary to bring forward here.

This is probably the place to notice a subject of much consequence in connexion with fatty heart—I mean the administration of chloroform, which some consider may be safely done.* For myself I cannot conceive how such an opinion can be held. I believe that in the healthiest frame this agent cannot be used without some risk—small, very small, though it be; but to suppose that it can be used without very great risk when the heart is fatty, is surely going further than any known facts will warrant. Independent, however, of any theory, the cases adduced by the late Dr. Snow seem to me to prove conclusively that chloroform is a most deleterious agent in cases of fatty heart, for out of some 50 fatal cases which he records the heart was found to have been fatty in nearly 40, and since his time the number has been largely increased; nor can any reader of the periodicals fail to have observed the great number of instances in which the organ was found fatty—in fact, the exceptions are very few. If this be

* "There is no special risk," says a writer in *The British Medical Journal* for November, 1869, and speaking of chloroform, "in cases in which the heart is known to be diseased." It is to be hoped this would not now be advanced.

not proof of the point I would establish, I know not what would be considered such. It is true that ether has in a great degree now superseded chloroform, but this does not lessen the risk arising from the latter, which it must be allowed has some special points in its favour. But this is not the place to enter further into the subject.*

* It is strange that in this same journal for November, 1879, I observe a case is given which proved fatal from the use of chloroform.

CHAPTER IV.

ETIOLOGY OF THE DISEASE.

WHAT can be said on this part of my subject? But little. It must be admitted that certain constitutions are predisposed to get fat, or rather fatter than is good for health, and the tendency is then so strong that no efforts on the part of the individual seem capable of averting it. In some instances the tendency would appear to be hereditary, and it will sometimes affect the boys and again the girls of a family. In the remarkable series of cases detailed by Meryon, of London, and to which attention has been already drawn, it was only the boys were attacked. Independent of this class of cases, which must, from their character, be considered very exceptional, there are, however, others in which one of a family will exhibit obesity. It is to be noted, too, that a good many, both infants and young people, may be very fat, but, as they approach adult life, gradually lose the tendency, and may grow up even thin; others, again, will retain their exuberance of fat till they have reached middle life, and will then begin to lose it, and this may go on till they actually become thin, and all this may occur without any serious disease being present. Anyone who has lived long in a large city cannot fail to have observed instances of all these

changes going on under his eye. I have noted a good many of these. Illness would, of course, account for some of them, but I am speaking of cases where the party remained well after having become thin.*

For so far the remarks apply to individuals who had little or nothing to say, as far as their acts had gone, to the changes which their frames underwent. But these are very exceptional cases when compared with the next class of which I would speak, and in which the fatty disease arises directly from the acts of the parties themselves—I mean, of course, those who eat too much food, or, what amounts to the same thing, who take too little exercise in proportion to the food they use. My entire experience goes to prove that these are a numerous class, and are far more common in some countries than others. No one who has visited England can fail to have been struck with the number of portly persons to be seen there. Compared with Scotland or Ireland the contrast is very striking. But, some one may ask, what follows from this? The answer is that in such frames the heart shares in the general state, and, it may be assumed, is affected with fatty growth. I have never yet examined the body of a person who would ordinarily be called fat in which fatty growth on the heart did not also exist. Exceptions there may be to this rule, but they must be very rare. It is quite unnecessary to describe this growth again, for it is with its causes we are now more directly concerned. Neither will it be at all necessary to enter into the physiology of digestion.

* Some of my schoolfellows who were remarkable for being thin have, as life advanced, become very fat.

It will serve my present purpose to state that too much food, whether animal or vegetable, or both combined, has a strong tendency, more particularly at and after middle life, to make people fat. I mention middle life because previous to this period sickness of one kind or other is far more apt to follow the use of too much food than for the person to get fat. At middle life, however, a change seems to occur, and the tendency then is to "fall into flesh," as the expression is. It must be allowed, however, that there is a something more than age and too much food to account for the change, for all under these circumstances do not become fat. It has been observed, and more particularly by Chambers, that those who have this tendency are persons who have small bones, small hands and feet, fine skin, and in whom digestion goes on with great rapidity; but the food may be used in strict moderation, and still the individual may become fat. Here it is that the party, after having led a very active and, it may be, laborious life, becomes sedentary in his habits, and this is very apt indeed to lead on to obesity, possibly more frequently than in those cases where too much food has been used. In both cases the food is more in quantity than the system needs, and fatness is frequently the result. Parties, too, who, to both these causes, take what is called passive exercise, seem to me specially obnoxious to this state. Coachmen might be given as very good examples of this, and the jolly appearance of many of this class must be familiar to all.

The state known as plethora has an important bearing on this part of my subject. With many this state is not

considered one of disease—whether or not its connexion with obesity is very marked, nor is it easy to suppose a case of superfluous fat which has not been preceded by a state of plethora. Hence a recognition of this state becomes very important, and the more so as our interference with it will surely be followed by very much more benefit than when the party has once become too fat. This is not the place, however, to enter into a full detail of the plethoric state. I must refer the reader to the works which treat of it. Suffice it to say that the parties suffering from it are very apt to have a cough which is peculiarly hard and ringing, and grates harshly on the ear, while there is little or no expectoration. Their breathing, too, is thick, and they are easily puffed.* The pulse, on first feeling it, would seem to be weak, but in reality is not so, for when more closely examined it will be observed to bear pressure, and is in a degree incompressible. The breath is heavy, the tongue furred and whitish, and if the throat be examined it will be observed to be congested, as are also the eyeballs, and the whole face frequently exhibits the same state. With these symptoms present we need have no difficulty in recognising a state of plethora, which, if not checked, will surely lead to fatty growth. In this state it is that hæmorrhages so frequently occur, and often to a most alarming extent. There will be occasion to allude to this part of my subject again.

In females who have reached middle life, I need scarcely say, a tendency to develop fat is of common occurrence. This has been often attributed to the

* "Fat and scant of breath," as the great poet expresses it.

cessation of menstruation, and no doubt this has some influence, but it must not be overlooked that they are subject to the same laws which affect men. It has seemed to me that unmarried females are more apt to get a full habit of body than those married, and more particularly when these have family, for if they have none the tendency to get fat seems to be very strong.

All that has been yet stated in this chapter is, comparatively speaking, plain sailing. It has all related to fatty growth, but it is a very different question when we come to deal with fatty degeneration, for the causes then are much more obscure, if, indeed, they be known at all. We do know that fatty growth leads on to degeneration of the muscle on which the fat grows, by first separating the fibres, and later still it literally supplants the muscular fibre itself; but in the more perfect forms of the disease it would seem that at no period did fatty growth exist, and that degeneration of the muscle was the first and only change observed. Here it is that the cause is so obscure. Some have thought that this was the result of disease, whilst others have held an opposite opinion. "The whole history of fatty degenerations," says Paget, "concurs to prove they are the result of defect, not of disease, of the nutritive process." That it does not reach to actual disease may, I think, be conceded, else we would have the results of disease. But, I must add, I have often got the impression that diseased action of some kind is at the root of this change. A sense of uneasiness, amounting often to pain, is, I know, of much more frequent occurrence than has hitherto been noticed; and

this occurs no matter what muscle is being degenerated. Quain gives 19 cases out of 83 where long-continued pain existed in the heart, and I have no doubt that, in a lesser degree, pain was still more common. Such, at least, has been my own experience. The diaphragm is peculiarly apt to be so affected, but the pain or uneasiness may affect any muscle. Now such a pain must arise from some cause, and in some way implicate the nerves; and my conviction now is that they are the first to take on diseased action, which is necessarily attended by pain, and which leads on to fatty degeneration. This view still needs absolute proof, for there is too little yet known about the state of the nerves in the diseased part. But the advancing knowledge of the day goes to prove that, in some cases at least, the nerves have been found diseased. I have already spoken of this as occurring in pneumonia, and the paralysis of the insane.* The nerves, too, have been observed both atrophied and the contrary. In elephantiasis the latter has been found, whilst in all, beyond that of health, fatty granules seem to play a prominent part. In relation with this subject the experiments given by Quain on fatty degeneration, produced by artificial means, must not be forgotten. He found that, besides the degeneration of muscle, both the nerves and blood-vessels were also affected with the fatty change. If, then, we are to suppose this change to begin in any one structure—and some such idea must be held—there

* As bearing on this subject I may allude to the alteration the nerves undergo in a stump, where their cut extremities become large and bulbous.

seem to be the strongest grounds for supposing it to be the nerves which are so affected. When once they are involved we know, as a fact, that serious loss of function, in the shape of atrophy, degeneration, loss of power, change in the skin, pains of varied kinds, &c., are apt to ensue,* and thus a simple explanation is given of fatty degeneration of muscle. It is more than possible this change in the nerves may be due to inflammatory action of a low kind. Usually the nerve is hypertrophied, showing the result of morbid growth; and this can scarcely occur without increased action of some kind. On the whole, then, I am inclined to think it is the nervous function which is in the first instance involved, and that this is due to increased action of the part—possibly to one of the forms of inflammation. Nor does this view clash with the idea that there may also be defect of the nutritive process; for it is clear morbid action, such as I have spoken of, may go on in a system where there is also a defect in nutrition, just as we see occurs in the strumous diathesis, where inflammation of a specific kind is common to a degree. Indeed, it is very possible that true fatty degeneration may be the result of both morbid action and also some defect in the nutritive process. This view, at least, explains all the phenomena present.

Sometimes an alteration in the functions of the skin has led, or has seemed to lead, to obesity. Thus, in

* As bearing on this part of the subject I would refer the reader to the very able work of Weir Mitchel—a work which sheds a flood of light on the subject of which it treats.

some parties who have had extensive disease of the skin which has been cured, it has been observed that they have been liable to get fat. Napoleon the Great was a striking example of this, which would remind one of what has been already stated about females at the cessation of the menses, for in both instances it has been the stopping of a discharge which has led to the same result.* It has been already mentioned that a good many insane people become fat in the course of their illness. The cause of this probably lies in the fact that their illness entails confinement—in other words, bodily exercise ceases, and, just as occurs with sane people, they get fat. Whether the tendency to become so is greater amongst the insane would seem not to have been determined. In the form of the disease known as the general paralysis of the insane it would seem to me that this tendency is very marked. I have rarely seen this disease that the parties affected were not of a very full habit of body.

What is the connexion between gout and obesity? Very close, I believe. Most gouty people, at least when it shows in a well-marked form, are fat, and nothing is more common than that they may be observed becoming so previous to the development of the attack. I think, too, thin people seldom comparatively develop sthenic gout. They will have all the pains and much of the suffering, but not the typical disease. Such has been my experience at Simpson's Hospital, where the varied

* After an attack of fever it sometimes happens that the individual gets fat; and Colles mentions the same thing as occurring, in some instances, after the use of mercury.

phases of the gouty poison may be seen in every aspect. That a number of persons have this poison in them who never show gout I take to be certain, and most important it is to recognise it. There will be occasion to bring this part of my subject under notice again.

When speaking of the use of too much food as a cause of obesity, I should probably have noticed the taking of drinks, and more particularly what are known as strong drinks. That these latter have a powerful tendency to make people bloated and fat, admits of no doubt. Malt drink of every kind acts specially so, and this is one of the reasons why so many Englishmen present a full habit of body, for in England the use of malt drink is very much more general than with us. These drinks seem to act in proportion with the quantity of nutritive material they contain. At the same time we must not overlook the fact that any fluid, even water, if taken in excess, has a tendency to render the person bloated. There can, I think, be no doubt that parties who drink whiskey to excess have, during part of their career at least, a tendency to get fat, and this is shown to implicate the heart by the presence of fatty growth. It is strange with these facts before us that some are still found to assert that strong drinks have no nutritive value.

Milk is a fluid which requires a special notice. Many adults use it under the idea that it is quite harmless, whereas it is just the contrary, and in many grown persons engenders a state of the system always bordering on disease, and frequently running into it. Gout is a common result of its use, together with a bloated

state of the frame, and what is called thick breathing. I have met cases where even symptoms of angina pectoris seemed to arise from its use, and where amendment at once followed when it was given up. At the present day there is such a cry out against the use of strong drinks that many are induced to try milk. Of the two I would say that strong drinks—taken, of course, in moderation—do far less mischief than milk. The composition of the latter, and the ease with which it can be drunk and then digested, accounts for its effects. In the next chapter there will be occasion to revert to the effects of food, whether liquid or solid, on the frame.

CHAPTER V.

ON THE TREATMENT OF FATTY HEART.

In making some remarks on the treatment it will be necessary to keep in mind the divisions of the subject already described, and, first, where fatty growth exists on the heart. This, we know, is a state quite compatible with excellent health and vigour; still we also know that its tendency is not to remain stationary, but to go on, it may be slowly, from bad to worse. I need not again describe these changes. But the question arises—Can anything be done to avert them? Will treatment, medicinal or otherwise, stay their progress? It would certainly be going farther than any facts will justify to assert that we can cure the state of which I am speaking, but I believe firmly that we can stay its progress—that is, render the disease stationary. This principle I take to be of great moment in the treatment of many chronic affections, fatty disease amongst the rest. The disease is kept at bay, as it were, and the life of the individual is so far bettered and prolonged.

Before entering on this part of my subject, I assume there is no valvular disease present, that the party is either fat or getting fat, and that there is evidence of fatty growth on the heart. The measures to be used against this state may be divided into general and

special. On each of these I shall now make some remarks—and, first, of food. Before taking this up, however, there is a plan which, a few years since, became very fashionable, and about which a few remarks may now be made—I mean what has been called Bantingism, which got its name from Mr. Banting, who brought the plan before the public in a printed essay, giving the details of his own case. The plan consists in a very restricted use of animal food and bread, no vegetables being allowed; and it admits of no doubt that, not only in Banting's case, but in others, the results were very striking. But is it a plan which can be generally carried out? I believe not. A large number of persons have neither the perseverance nor the fortitude which such a plan requires. The desire for eating is so powerful that it overcomes the strongest resolutions, and people will eat rather than subject themselves to such restrictions as Bantingism entails. Independent of this consideration, however, there is another and much more important one remains to be noticed. There is, I believe, a certain amount of risk attending the plan. Nature intended us to be omnivorous; and to subject the human frame to a particular kind of food—more especially animal food—is sure to lead to serious results. In the expeditions to the North Sea it is known that the utmost care is requisite to preserve the health of the men, and that no care will preserve it beyond a certain time; yet animal and nitrogenised food enter largely into the diet. So I believe it to be in our own more temperate climate, and that Bantingism will surely lead to impaired health. Under any circumstances, I believe,

it should never be undertaken except under medical supervision.*

Whilst, however, objecting to the plan of Banting, I would have it understood that it is because it goes too far. It is, I believe, right in principle, but pushed to an extreme. Hence, in treating such a state as I am now considering, the diet should ever be restricted in quantity and quality; animal food should only be used once in the day; and all highly nitrogenised foods, such as eggs, cheese, &c., are to be forbidden. Of milk I have already spoken. As far as possible the oily foods are to be avoided. If called on to decide, however, between quantity and quality, I believe the former to be of much more consequence than the latter; and, besides, we know that it is not possible to divest animal food of all its fatty matter. Still, all writers are agreed that, as far as may be, fatty food is to be avoided. It need scarcely be observed that sugar, in its varied forms, is to be used with great restrictions, or even given up entirely.

Though I have spoken of the use of fluids as a cause of obesity, I must again revert to them, for abstinence from them, as far as possible, I consider an important part of the treatment. I do not speak now of strong drinks in particular, but of any fluids—even water. All must have observed the differences in this respect which

* As bearing on this point I may remind the reader of the plan which Rollo recommended for diabetes. It consisted in the liberal use of animal food, and the exclusion of vegetables, and in several of the cases this was followed by such symptoms as rendered it necessary for the plan to be given up, at least for the time.

obtain at the dinner table. Some take literally none, whilst others cannot begin dinner without a hearty drink. Many, however, drink more from habit than necessity, and if the tendency to grow fat exist, this habit is sure to increase it. Hence a very limited use of fluids should be enjoined, and what is known as a dry diet should be carried out. In the lower animals, as the horse, this principle has been long acted on, as it is known that the greatest amount of work is got by so doing; and though this may appear to be a different point from what I have been discussing, it has yet an important bearing on my subject, and will have to be brought under notice further on.

It may be observed here that there is nothing easier than to lay down rules for the treatment of persons inclined to get fat; but to carry out these rules—and, above all, where restrictions are put upon eating—is no easy matter; and, speaking of the public generally, they will much rather take medicine, even of the most nauseous kind, than restrict themselves in the matter of food. It is not uncommon either for parties to admit that they eat more food than is needed, but unconsciously, as it were. It was this statement which led me to suggest a plan, very simple in itself, and yet effective. It consists in having some part of the dress worn round the body a shade tighter than what is needed. This will always remind the individual when he is eating, and, at the least, warn him of not going too far. No doubt of it, in every sense of the word, it is a restriction, but of a kind to which no reasonable person can object. Whether it has been already suggested I

cannot say, but I do not know of its being spoken of by any author.

It would be a very easy matter to enter at length into the particular kinds of food best suited to the state of which I am speaking. The chemical analysis of all foods has now been brought to great perfection,* and the physician can advise with much precision and certainty. But to enter into these details would far exceed my present limits. All I wish to speak of here are leading principles.

Exercise.—Next to food in importance comes exercise, which can be made a valuable help both in reducing superfluous fat and in preventing its formation. Most, too, of the class of which I am speaking are of the sanguineous temperament, and active in their habits; and exercise, even of a severe kind, will be taken with infinitely more steadiness than the rules to be followed about food. The kinds of exercise must, of course, be suited to each particular case, and should be so regulated as not to throw any inordinate strain on the frame. If it do, more harm than good will arise, and this point is more particularly to be attended to at the commencement of the plan. If in this way exercise be taken—in a very limited way at first, and then gradually increased—it is remarkable to what an extent it can be carried, and with the greatest benefit. Parties who were at first thick in the wind and unable to run at all, will shortly be enabled to do so, and this will be attended by some reduction of the outside fat, and, it may be presumed, by a lessening

* At the South Kensington Museum, London, can be obtained an admirable catalogue containing an analysis of all foods in ordinary use.

of what is on the heart itself. I say presumed, for it must have been noticed by all that even in wasting chronic diseases—such as phthisis—the heart retains some fat on it even after all fat from other parts of the body has been absorbed. It looks as if the heart were the very last part to lose its fat—hence we must be very slow in assuming that exercise or any other means is capable of lessening the fat which has been once deposited on the organ. On the other hand the benefit which arises from well-directed exercise is so striking that it is hard to suppose no change has taken place in the amount of fatty matter on the heart. It may be that the improvement arises from the increased tone and vigour given to the muscular part. But then we know that when parties go in for what is known as "training," all superfluous fat is sure to be removed. On the whole, it is most likely that some, at least, of this superfluous fat on the heart itself is capable of removal by the means of which we are speaking.

It is to be noticed that the reduction of the weight of the body, by even a very few pounds, is a difficult matter. I have known some who were greatly taken aback when, after a month's trial, they found they were the same weight. On the other hand, when they had succeeded in reducing themselves some three to five pounds, the inducement to persevere was of the very strongest, and they were sure to go on with the plan.

The effects of the carrying out of walking exercise can be greatly increased by the simple expedient of making the party wear heavy clothing. This is irksome

at first, but habit soon accustoms them to it. I need scarcely add that by this means the skin acts much more readily, and the weight of the body is by so much reduced; and I believe there is no surer nor safer plan for effecting it. It is obvious that the warmer the weather the more effective it is.*

Friction.—In close connexion with exercise comes friction of the surface of the body. It might be described as exercise of the skin, and it admits of no doubt that, if thoroughly carried out, its tendency is to reduce the fat of the body and prevent its deposit—at least on the external surface. Like many other remedies it was much more used formerly than at present, and some of the physicians of the last century made their great reputations by this very means. Most individuals can, of course, carry out the rubbing for themselves, but to render it infinitely more effective it ought to be performed by a second and trained party. This is now done where the Turkish bath is used, but it is only in a degree, and not at all to the extent to which it can be carried. It is supposed by many that the towel to be used cannot be too coarse. I believe this is a mistake, and that a soft one is much more effective. I need scarcely observe that the effects of rubbing are not confined to the keeping down the fat of the body, for it, at the same time, brings the muscular system into the highest state of efficiency of which it is capable. Hence it will make indolent persons active

* Amongst jockeys the plan of wearing heavy clothing, for the purpose of reducing the weight of the body, is being constantly carried out, and I have heard of results which were scarcely credible arising from it.

almost in spite of themselves, and to those who are inclined to get fat it gives a vigour and elasticity of which they did not think they were susceptible. How far it could be carried it would be hard to say, but with ordinary care that the skin be not injured it would almost seem to have no limits. Whether any modification of it—such as shampooing—would increase its effects I cannot say; but obviously cases will be met where this plan may be required.

Warm Baths.—What can be said of these in relation with my present subject? I have not been able to satisfy myself that either as a simple warm bath or the Turkish bath they are capable of reducing the fat of the system. I have known a good many resort to the Turkish bath, and for a considerable period, and be disappointed at the results. They, of course, keep the skin in an active condition, and so far do good; but farther than this I cannot go. As to the continued use of the warm, and more particularly the Turkish bath, I would not advise it at all. I believe the tendency then is to lower the standard of the general health, without, at the same time, effecting any reduction in the weight of the body.

In making the foregoing observations it will be obvious that no one of the means spoken of is to be adopted to the exclusion of the rest. All are to be carried out at the same time, so that the restrictions on food, exercise, frictions, &c., are, as it were, to assist each other. By this method the best results will be obtained; and even should they not be as decided as could be wished in reducing the weight of the body, they will, at any

rate, bring the health to the highest standard, and cannot, under any circumstances, do injury.

Are there any medicines capable of reducing redundant fat in the system? It is known there are. The chief of these is iodine and the plants which contain it—of which the Fucus vesiculosus is the one that has recently come into general use. It has been long known that the continued use of this substance is capable of causing a great absorption of the textures of the body—the fat amongst the rest—and that if persevered in it may even do serious injury, as shown by the disappearance, in some instances, of the mamma and testes. Hence there is considerable need of caution in using this drug, or, indeed I may add, any drug which acts in a similar way. And this leads me to speak of potash and its salts, which, there can be no doubt, are capable of causing the absorption of fat. The chief of these, however, is the water of caustic potash, the liquor kali of the British Pharmacopœia. Its effects are well known and long recognised. No writer has made more important observations on this drug than the late Sir Benjamin Brodie. He has shown, in a very striking way, the great powers it possesses, and given the detail of some instances where the reduction of the fat was very considerable. In one of the cases it was a number of fatty tumours with which the patient was affected, and these, under the influence of the potash, became very much lessened. Nor could the dose be considered very large, as it was only half a drachm three times a day. A point of very considerable consequence arises out of these observations—I mean the difference in the quality of the fat in different cases.

In some it is very firm and brawny; in others much softer, and on the internal parts of the body approaches to a diffluent state. Indeed, wherever fat accumulates on the internal parts, so as to constitute disease, it has always, in my experience, been very soft. Now in this state I believe it is much more readily affected by such a drug as potash than if it were of a firmer texture; and if the fat had accumulated on both the internal and external parts, I believe the internal fat would disappear sooner than the external—something on the same principle that serum would be absorbed sooner than pus.

But whilst speaking of the use of caustic potash for the absorption of fat, it must not be overlooked that with a good many persons potash disagrees, and in such a way that it cannot be used, even in the milder forms of citrates or carbonates. In such it produces a severe form of indigestion. On the other hand I have known enormous doses to be taken without any such results. I recollect seeing a prescription of the late Golding Bird, in which the dose ordered and taken was half an ounce of the liquor potassæ three times a day. The patient was a very large fat man, and laboured under saccharine diabetes. When potash is being used it is always well to order it with some tonic, in order to lessen its depressing effects. Brodie gave it in small-beer.

Whether any of the spa waters would be capable of reducing the fat of the system I cannot say. Some of them, especially those containing the muriate of lime, have occasionally been found useful in the removal, by absorption, of fibrous tumours of the uterus. If given

in sufficient doses the spas which contain purgative salts would certainly reduce the fat of the system. But it is obvious this is a plan which would have to be used with caution.

There still remains a means of reducing the fat of the system, or at least preventing it increasing, which I believe well worthy of notice. I mean issues—a remedy much more used a century since than at present, and capable of effecting much in other diseases besides the state I am now considering. There can be no doubt that the keeping up a purulent discharge puts a considerable strain on the system, which will, of course, bear a proportion to the amount of pus formed, and if not watched it is quite capable of doing injury. Fat persons, however, bear it well, and it is very easy to modify it to the requirements of the case. The arm or front of the chest are probably the most convenient places to have the issue, for there the patient can manage it himself. In some constitutions an issue cannot be used at all; the skin is so irritable that it will not bear the wound to be kept open, and the suffering is such that the remedy is worse than the disease. In others, again, an issue will be worn with wonderfully little annoyance. Even allowing, however, for its inconvenience, there are a number of cases in which an issue, of a size proportioned to the case, is about the surest means I know for keeping the excessive growth of fat at bay. A little farther on there will be occasion to speak of this remedy again. It is noticed here because it comes fairly under the head of general measures, which I have now been considering.

In an earlier part of this essay allusion has been made to some of the specialities of disease which occur in connexion with fatty growth or degeneration. With the object of saying something about treatment it will be necessary to revert to these again; but it may be stated here, once for all, that fat persons are bad subjects for attacks of disease, no matter what the form of disease be. To all forms of fever fat individuals are peculiarly obnoxious, and this I have already stated, as well as the great importance of an early use of stimulants. Typhus fever is a peculiarly fatal disease to them, and I take it to be at least one of the causes of the greater fatality of this disease in London than in Dublin, for the English, as a race, are of a much fuller habit of body than the Irish, and the late Dr. Murchison has fully established the point to which I allude. These remarks, however, are but generalities, and for the purpose of speaking of the special diseases incident to fatty disease I shall describe them in connexion with the head, chest, and abdomen, and begin first with those of the head.

In an earlier part of this essay I have drawn attention to the great importance of recognising symptoms of brain disease, which are in reality but a part of what I have called the fatty diathesis. In other words, when the cerebral symptoms show themselves, the great probability is that the heart is affected too. I need scarcely observe this is a much farther advanced stage of the disease than what I have yet spoken of. Now it is quite unnecessary to detail again these brain symptoms. It is enough to know, for my present purpose, that they

are commonly secondary to changes which have been going on silently in the heart, and possibly elsewhere, and that it is on this view of the case it is to be treated. I do not for a moment maintain that brain symptoms of the kind described are all of the one character. This would be absurd, for they might be due to a blood-clot, or aneurism, or embolism; but I think I may say that the great majority of cases are of the kind I describe—in other words, fatty disease, causing brain symptoms, is by much the most frequent cause of them. It is to be observed that cerebral symptoms arising from this cause are, comparatively speaking, of a much more transient character than when they arise from any other. In the first instance, indeed, they might be described as evanescent—they come and go with such rapidity. Now it is not so when these symptoms arise from any other cause. A clot or other cause produces symptoms which are much more enduring, and only disappear, if they do so at all, very gradually. This is a very important difference between this class of cases, and it may be put in another way, for cases arising from the fatty diathesis are very much more amenable to treatment than the others. I have observed, too, that in these cases the symptoms, especially at first, are confined very generally to the head and face; and it is only when the disease is farther advanced that hemplegia will show itself, which even then often disappears completely.*

Now, if we suppose a party above sixty years of age

* The reader need scarcely be reminded of the many cases on record bearing out these remarks.

affected with cerebral symptoms, can we do anything to stay them? A great deal, I believe. An alterative course of mercury will in many of them do wonders, and a very small quantity is required for this purpose. Wilson Phillips' plan suits very well, nor have I seen any bad results from it, and I have now had a very considerable number of cases to treat. Let not the reader suppose, however, that a complete cure will be effected by this means. This is not what I would convey, but only that a check is given by it to the advance of the disease, and that under favourable circumstances this improved state may last for years, and it is very exceptional indeed when no improvement results. To the alterative course described other treatment will necessarily be added. Moderate exercise will be enforced daily, the food and clothing will be regulated, and a small amount of strong drink allowed. The bowels call for special attention, for constipation at this stage and frequently through the entire disease is the general rule. This is not the place to enter into the special purgatives or aperients to be used. Suffice it to say that the combination of a tonic and carminative with the aperient will very often be found to suit well. I should have stated that from ten to fifteen days is a fair time to use the alterative doses of mercury.

By these conjoined means a great deal can be done in staying the progress of the cerebral symptoms. But some one will ask here, what cerebral symptoms? And to this I answer—slight hesitation in speaking, very slight signs of facial paralysis, symptoms of impaired memory—as, for instance, the memory of words—a

marked tendency to sleepiness, very possibly a tendency to vertigo, and it may even be at this early stage sudden fits of unconsciousness. One and all of these will be removed, for the time at least, by the means indicated, and that it is the treatment does it is proved by the fact that they will be removed again and again by the same plan; but the time arrives when this treatment fails, or at least is not so effective, and the disease is then, it may be assumed, farther advanced.

The only special cerebral symptom which calls for notice here is the state of coma—I mean, of course, in connexion with fatty heart. This may be under two forms—one being the transient form just described, and which recurs again and again, leaving the patient perfectly well between the attacks. This is the form which all the writers on fatty heart have described as so characteristic of this state, which, I believe, it undoubtedly is. It may even leave a slight temporary paralysis after it, which, however, shortly disappears. The face gets pale, and the pulse at the wrist fails, whilst the cause seems to be due to a sudden failure in the action of the left ventricle of the heart—in fact, it is a kind of faint, due, however, to fatty change having occurred in the organ. I have observed that any, even the slightest, derangement of the stomach surely aggravates these attacks, and makes them more frequent. They may, of course, prove fatal, and I have known a second attack of the kind do so. On the other hand, the great majority go on for a much longer period, and I have already spoken of a case which has gone on under my own eye for at least five years, and does not

seem worse now than at first. Formerly the treatment for these cases was general bleeding, and it must be matter of surprise to anyone who reads the cases given by Cheyne and Adams to what an extent it was then carried, and yet, it must be allowed, without any marked injury to the patients. If anything of the kind were attempted at present it would be set down as little short of murder, so different do we now view blood-letting from what was done in former days. Those cases were, in truth, looked upon as of the nature of apoplexy, and the true cause—the state of the heart—seems to have been entirely overlooked. We now understand the nature of them better, and our treatment has altered accordingly, and we know that very little indeed is required. Some stimulant application externally, and a light stimulus internally, with a short period of horizontal rest, is all that is needed, and many instances occur where the attack passes off without anything whatever having been done.

But there is another form of coma of much more consequence than what I have been describing. It occurs at a more advanced period—in fact, when the fatty change in the brain and elsewhere has a tendency to form serous effusions. In the brain this constitutes serous apoplexy, and is ever a serious affection. I have seen several instances where it proved rapidly fatal. In others, again, after a great struggle the patients recovered, whilst in a third the disease took on the chronic form, and occupied many months, of which I have given a very striking example. I have already alluded to the little importance attached by writers to

this state, in which view, as stated before, I do not at all concur. I am sure it produces definite and marked symptoms, and, what is of very much more consequence, it is often amenable to treatment. What, then, should the treatment be? I believe blisters are of essential service; and here, again, mercury will be found most beneficial. In some instances it may even be pushed to salivation, and the plan suggested by the late Dr. Law will then be found a very good one. The specific effects of the mineral are thus easily obtained, and, if I may so say, at a very cheap cost to the frame. I may mention, too, while speaking of mercury, that I have found the bichloride of marked benefit.* Considering its great activity it is remarkable how easily it can be given, and it has the great advantage of seldom, if ever, causing salivation.

These cases of serous effusion are frequently attended by some forms of paralysis. The bladder, too, may be seriously involved, and yet all these symptoms may disappear entirely under a line of treatment such as I have indicated.† As a sequel to what has been stated above, diuretics will be found most useful; but it would be quite foreign to my intention to enter farther here into this part of the subject. That cases of the nature I describe may be benefited in a very marked way, and for a long period, I cannot doubt, even though it may be admitted that the disease, in the long run, returns.

* My friend, Dr. Hudson, will call to mind cases where this medicine was used with great advantage for the time.

† The late Mr. Colles has given some cases so similar to those of which I am speaking that I would draw special attention to them.

The beneficial results of treatment turn entirely on the recognition of the true nature of the disease, and carrying out the treatment itself systematically.

The affections of the lungs which complicate the fatty diathesis are—wheezing, bronchitis, pneumonia, œdema, and dyspnœa. These are met chiefly in connexion with fatty affection of the right heart. I have already stated that the wheezing may exist *per se*—in other words, without any cough, and this is an important point to notice. The patient complains of it only when in the recumbent posture, and at first the mere clearing the throat seems to get rid of it. At times it is quite sufficient to disturb the patient's sleep. Slight as it appears, it is not by any means easy to relieve. Some outward stimulant at night does good for a time, as well as the treatment suited to the bronchitis, of which more or less is usually present. It is, however, as I take it, more of the nature of congestion than inflammation with which we have to contend. The circulation is sluggish and congestion results. Some warm stimulant, such as punch, is frequently useful, and this the patient is very apt to have learned before he consults anyone. Some nights will pass without any annoyance at all, and then without any apparent cause it will return. Whatever improves the general health benefits it, but into this I need not go further. In the way of medicine the preparations of ammonia are useful, and the same will apply to the bronchitis, even when it becomes a more decided disease than we have been supposing. The expectoration is very apt to be scanty, and much more at one time than another, even though

expectorant medicines are being freely used. It will be observed, too, that bronchitic râles are much more numerous at times; and this bears out what I have just stated about the expectoration. I do not know any state of the chest which more imperatively calls for a close examination with the stethoscope than the class of cases of which I am now speaking. There was occasion to allude before to this point, but it cannot be too often repeated. The act of breathing is carried on as if very little were wrong, so calm is it to the eye; and yet, with this state, the life of the patient may be in the most imminent danger. The cause of this arises from the state in which the intercostal muscles, as well as the ribs, now are. But into these I need not again enter; it is only as a caution the point is mentioned here, as well as the great importance of making a close stethoscopic examination. The point reminds one of the latent bronchitis which so often exists in fever.

When pneumonia attacks a person affected with the fatty diathesis, I have already stated that the attack is very apt to be accompanied with hæmorrhage—I mean pure blood as distinguished from rusty sputa. The explanation I take to be that the arteries have undergone a certain amount of degeneration, and the bleeding is the result. This bleeding is usually beneficial; nor need we at all fear the free use of stimulants, both in the bronchitis and pneumonia of which I am speaking. I have not been able to satisfy myself that quinine is suited to these cases, though a medicine which is at present in very general use for the disease. I prefer the preparations of ammonia or turpentine, or both

combined. With these I use blisters of full size, and I may here state, once for all, that I consider a grave mistake is made by those who order other means in place of them, such as mustard or turpentine stupes. These last do not, in my mind, compare with blisters, and yet they are constantly spoken of as if their results were the same. The difference between merely reddening the skin and causing it to rise in a blister, I take to be the difference between life and death—I mean in such cases as require this line of treatment.

When œdema exists, and I have before spoken of its great frequency, it commonly affects the basis of both lungs. This condition must, of course, be diagnosed from pneumonia; nor do I know any medicine which so rapidly and surely affects this state as mercury, given somewhat more freely than has been spoken of. The bichloride will often here be found of the most marked service, whilst the more usual treatment is, at the same time, carried steadily out.

Dyspnœa is a symptom which might be described as joining together the lungs and heart. There can be no doubt that its progress is very slow, and that it exists, in a degree, long before the patient is aware of it. I have sometimes thought that the state of the lungs alone caused it; and in some of these cases of the fatty diathesis puerile respiration is very marked. If there were any affection of the heart, this could be easily understood, but at the period of which I am speaking there is no evidence of this; still the presumption is that all is not right in the organ, and I have already quoted Andral as stating that puerile breathing fre-

quently precedes disease of the heart, so that it is not impossible but that in the fatty diathesis the same thing may occur. In the earlier stages of the complaint it is certain that dyspnœa can be greatly benefited, if not cured, by the plan of treatment already indicated; but as the disease progresses the dyspnœa become more permanent, and, as Latham would say, abiding, and treatment then can only give temporary relief. Finally the stage arrives when any—the slightest—movement causes severe dyspnœa, which even perfect rest scarcely relieves. The reader will recollect the special causes for this, which, being already described, need not be further spoken of here.

The affections of the heart, in connexion with fatty disease of the organ, which call for notice here are—valvular disease, dilatation, pericarditis, and angina pectoris. When the former exists it will, of course, add to the gravity of the case. It has seemed to me that the degeneration of the walls of the heart causes the valvular sounds to be weaker than usual, and this is what we might naturally expect. I have nothing to say on the treatment, except that, as a whole, it must partake, more or less, of what is understood as a sustaining plan—in other words, stimulants and tonics must form part of it. With these, however, cases do occur where local treatment affords marked relief. I may mention the application of one or two leeches or a small blister being often useful, and there are, of course, general principles to be attended to; but these have already been spoken of, and need not again be repeated. The same remarks apply to those cases where dilatation

occurs. In my own experience cases of this kind are rare, nor am I sure that any important difference exists in the treatment. When the right heart dilates, and the organ is at the same time fatty, the suffering is at a maximum, and most difficult is it to afford even temporary relief. Leeching will sometimes here do good, as will also dry cupping. When this state exists I need scarcely say there is great lividity of the face, and especially of the lips and ears. There is often, also, venous pulsation in the neck. Digitalis in very large doses of the tincture has in such a state been given, and, it is said, with very marked benefit, but I cannot confirm it myself.

Of pericarditis, as a complication of fatty heart, I have already spoken, and mentioned the important point of its great latency. In only one out of four cases was it even suspected. I believe this latency is mainly due to the character of the effusion, which, as far as I have seen, is of a purulent character. There is nothing, either, of the acute pain which so generally attends the more common form of the disease. The four cases just alluded to all occurred in gouty subjects, and the heart was greatly degenerated in each. In such instances, besides stimulants and blisters, I would use mercury in small doses.

What shall I say of angina pectoris? How is it connected with fatty heart? There is, I believe, no necessary connexion between them. Whilst the latter is a common affection, the former we know is very rare, especially in its best marked form. But what is its nature? Does it require organic disease to cause it?

I think not. There are authentic cases on record in which, after its continuance for months, and in an exquisite form, it has ceased and not returned. On the other hand, it may, I think, be granted that persons with fatty heart are more disposed to attacks of it—in other words, fatty heart is a predisposing cause of the affection. I think, too, it may be assumed that the gouty poison is a powerful predisposing, if not direct, cause, as is also the ossification of the coronary arteries. This last state, indeed, has been asserted to be the cause of the disease; but this is certainly a mistake, for, on the one side, we often find these arteries ossified, and yet the patient never showed any symptoms of the affection, and, on the other hand, it has existed when these arteries were perfectly healthy; and this bears out the fact that angina pectoris has completely disappeared after having existed in a very marked form. In these cases it would seem to me rational to account for the attack by the presence in the system of gouty poison.* I myself have never seen or known of any case of the disease in which there was not evidence of gout in the system, and when the attack has passed off it is sure to be attended by a copious deposit in the urine. Should the latter, too, remain high, and no deposit appear, it may be taken as certain, no matter how well the patient may appear, that the attack is not over—in fact, the state of the urine may be looked on as a regular barometer of the state of the patient.

* As bearing directly on this point I would again revert to what Paget has stated about the gouty poison causing cramps. Is it not possible for it to do the same with the heart?

What is the state of the heart during the paroxysm? As many others have done, I believe it to be one of spasm. This view, I think, explains best the several symptoms, and is borne out, too, by the results of treatment—of which opium, in one form or other, is, or used to be, the sheet anchor. It is well known that there are a number of cases on record where this drug relieved the attack again and again;* and now that a still more effective mode of using it has come into use, there can be no doubt that it is the proper means to put in force. I myself have met no case of angina since the subcutaneous injection of morphia was discovered, but if I did I would certainly use it. Like many other drugs the use of opium in these cases seems to have been forgotten, though, as already stated, the evidence of its value cannot be questioned. In its place we have now the nitrite of amyl; but, whilst allowing its great power, I do not consider it at all safe. A drug that causes such a feeling of bursting in the brain cannot be given with safety, and particularly in the class of cases of which I am speaking; for whilst the heart itself is the organ affected in angina pectoris, it is quite possible the cerebral vessels are more or less diseased, as the preceding remarks, whilst speaking of the morbid anatomy, will have led the reader to understand. The nitrite of amyl—whether used by inhalation or given internally—constantly produces a severe sense of distension in the

* The case of the late Sir Charles Bell was a very notable example of the value of this treatment. It is rather strange that, in looking over his letters, this distinguished man never speaks of his disease as angina pectoris, but as attacks of spasm.

head, and it is not straining the idea too far to suppose that mischief might result from its use in these cases.

With opium, ether* ought also to be given as a stimulant, and, in its absence, hot brandy punch will be found very useful. There exists commonly in the attack a great sense of sinking, and a feeling of death, which stimulants relieve. Should there be collapse—and more or less is apt to be present—the ordinary means will, of course, be used.

As bearing on the fact that spasm is the cause of the attack, it must be remembered that it usually ceases as suddenly as it began. Spasm would seem to me to account for this better than any other theory.†

There is one point worth attending to when called to a case of angina pectoris. Very frequently the attacks occur at night, and out of sleep, as the expression is. Should this happen, particular inquiry should be made as to whether the patients had supped, and what they had taken. I have known—and others must have known it too—the most incongruous things eaten at night, which, if the party be subject to angina, will surely

* The subcutaneous use of ether is known to be a very potent measure in rousing the system when depressed. I have seen some very striking examples of this.

† It has been lately stated—indeed it has been assumed—that vaso-motor spasm of the arterioles is the starting point of angina pectoris—in other words, that the attack arises elsewhere than in the heart. I cannot accept this view as being always, or even generally, correct. If in the attack the pulse were always of the same character, and betokened a high tension, then some weight might be attached to this opinion; but it is notorious that the pulse, like the heart, varies much—being in some cases very full and in others the very contrary.

cause an attack. Under these circumstances a stimulant emetic is the best treatment, and this can then be followed by the other measures indicated.

For so far I have been speaking of the treatment during an attack. When it has passed off, however, a very important question then arises as to the means to be used. Can anything be done to avert these attacks? or can we at all hope that the disease may be entirely cured? A great deal can, I believe, be done to avert them, and I think there is quite sufficient evidence on record to show that—occasionally, at least—the disease is cured. It would seem to be the general impression that when once the disease was established it must go on to a fatal termination. This is not so, and it is very important that we should be aware of the fact; for otherwise we would be merely trying to palliate when our efforts should be directed to effect a cure.

In considering this important part of the subject it must not be forgotten that angina pectoris may exist without there being any organic disease either in or close to the heart. It may certainly show itself without there being any ossification of either the coronary arteries or the aorta, or without fatty disease of any kind. On the other hand, if these exist they will predispose to attacks of the disease. Hence our efforts, in the first instance, should be directed to this point, and if no organic disease be found, we will then have much stronger hopes of being able to effect a cure. How, then, is this to be done? Besides a strict carrying out of the general principles for improving health, which I need not go over again, there are certain medicines

which have been found useful, and even curative, for this affection. The nitrate of silver has been found of great benefit, and in other cases the preparations of zinc have completely cured it. A remarkable instance of this will be found in Vol. III. of the "Memoirs of the Medical Society of London." As the patient's age was but thirty-five, it may be assumed that no organic disease existed. Tonics—especially those of the metallic class, like those just spoken of—seem to be very useful. Arsenic, too, has been largely used for angina, and is praised highly by Gairdener, of Glasgow. Where the heart's action is weak there can be no question of the great value of this drug, and I can speak of it in high terms myself, though I have had no opportunity of using it in angina.

Allusion has been already made to the gouty poison as a cause of this affection. In such the treatment must be more or less special in its character—the object being to rid the system of the poison.* As it is in rheumatism so it is in gout, and there are certain constitutions which seem to be powerfully predisposed, and from even an early age, to these diseases. It seems to me very doubtful whether such cases can be cured, even though a systematic plan of treatment may be adopted; and this remark leads on to another and very important aspect in which this subject must be viewed. In a considerable number of the cases of angina pectoris on record it has been observed that the patients were subject to affections of various kinds—such as gleety

* In an essay of this kind I have not thought it advisable to enter into the details of the treatment.

exudations from the scrotum and anus—intense itching of the latter part; eczema of the legs—ulcers on same; attacks of regular gout, and constant evidence of the presence of this poison without its full development. In all such cases it was observed that the attacks of angina alternated in a very striking way with the various affections; and as they all had a tendency to rid the system of a something injurious to it, the conclusion was come to that an issue might be beneficial to the attacks of angina. And such proved to be the case—for there are many cases on record where the result of this treatment proved most useful. And the point was established in another way, for in some of the cases, when the issue was allowed to close, the cardiac symptoms began again to show themselves, and at once subsided on the discharge being re-established; so that if the issue could not be said to cure the angina, it was, at least, capable of keeping it at bay. Of course, like other points in practice, every case would have to be considered on its own merits, and some cases do unquestionably occur where this plan would not be suitable. Allusion has already been made to those cases where the skin is so irritable that no issue could be worn, but these are exceptional cases, and do not affect the general principle. It need scarcely be added that those cases where Nature has already created a discharge should not be interfered with, except that the discharge may be so irritating, or the affection which causes it so distressing, that we may be called on to cure it. Under such circumstances an issue should be opened almost as a matter of course. For myself I believe that many

persons owe their safety to these natural discharges; and I have known a number of instances where very grave results, and even death itself, has followed their drying up. Sometimes Nature herself cures them, and then mischief is very likely, indeed, to result. On the whole I look upon the use of an issue as a most important means of at least lessening the danger in cases of angina, and I would give it a foremost place in the treatment of so formidable a disease. I have noticed it the more especially because it seems to me to have fallen quite too much into disuse. Very much could be said for it in other affections, but it would be quite out of place to enter on the subject further here. Formerly they thought nothing of having two issues at once, one in either thigh, but I believe one to be quite sufficient, and in the arm rather than elsewhere.

Allusion has been already made to certain cases which will not bear an issue. The parties that need it most are those who, at the time of the attack of angina, are getting fat, and are known to be heavy eaters. In such it is almost sure to do good. Its size will, of course, be proportioned to the requirements of each particular case.

These remarks about issues refer, almost exclusively I may say, to cases of fatty hypertrophy of the heart; for, in the cases of fatty degeneration where the organ is little if anything enlarged, an issue would not be suitable; they would not bear it at all. What, then, can be done for these cases? Little, I fear. We have no grounds for the idea that degeneration of the muscular structure of the heart is ever recovered from. On the

other hand, there seem strong grounds for supposing that once the state is established it is progressive, and goes from bad to worse. Slow it may be, and often is, but it is not the less sure. Yet if this state affected any other part of the frame—as, for instance, the leg—it is almost certain that remedial means would cause it to disappear. At any rate, whatever view we may take of this question, it is plainly our duty to act as if the means at our disposal were capable of bringing back the muscular structure to its normal state. Unfortunately, in the case of the heart we have no specific remedies for this purpose; and we are driven to use such means as are known to improve the general state of the system. These I have already spoken of, and need not go over them again. They constitute all that would come under the head of a tonic and bracing treatment. Anything of a lowering plan must be used with the greatest caution, if attempted at all. An ordinary purgative pill may prove fatal, as may also a very slight attack of diarrhœa. Influenza is a most formidable affection in these cases, and morphia cannot be too cautiously administered. I have known an ordinary dose prove fatal, and Paget gives two cases where the same result occurred; but in both of these the doses were above the average. With these facts before us too much caution cannot be used.

In connexion with what is understood as tonic treatment there are two points which call for more than a mere passing notice. The first is as to the use of stimulants—whether wine or others. Now, I believe their moderate use to be of essential service in these cases of degeneration of the heart, and the farther

advanced it is the more they are required. But it seems to me it is not solely as stimulants they are useful, but because the parties using them are, almost invariably, smaller eaters than those who do not take any; and in this aspect the question becomes one of the very greatest moment. Once the heart becomes degenerated I know no single point which modifies the state of health—nay, the very life itself—so much as the food the person eats, whether as regards the time of the day it is used, the quality, or, above all, the quantity. What is known as a hearty meal should never be indulged in. Let them, by all means, be nourished, but let this be done by well-defined rules. I am confident that everyone must have seen or known of cases where mischief has resulted from neglecting such advice. The public are frequently startled by a death which occurs in or near a train. The party, just after breakfast, had started to catch the train, but, seeing it moving, had attempted to run, and death results; or a party, after a hearty supper, is found dead in his bed. This part of my subject could be much amplified, but I need not do so; nor, to the medical reader, explain why death occurs; or, to the physiologist, remind him of the course and distribution of the eighth pair of nerves. I only glance at these topics here, because they have the closest connexion with the point stated above, and which I would again repeat; and this is—that the moderate use of strong drinks leads, or seems to lead, to a moderate use of food, when compared with those who take no strong drink at all. Indeed it is not uncommon to hear total abstainers boast of their appetites.

From the point of view, then, in which I have been discussing this question, I would say that stimulants should form a part of the treatment of those whose heart is degenerated, not only because they tend to keep up the action of the organ, but because, as a general rule, less food is taken; and when the time comes that the appetite for food fails, then stimulants by themselves can be taken, and so life may be prolonged far beyond what could have been expected. That, in a way, they supply the place of food I cannot doubt, and I believe they do so exactly in proportion to their composition. Malt drinks effect more than wines, and these again more than pure spirit. This may be put in another way: as long as appetite for food remains, the malt drinks should specially be avoided, and pure spirit will be found preferable to wine.

Another point in connexion with tonic treatment still remains to be noticed—I mean change of air or scene. Now, I do not for a moment question the value of this measure; it has both a power and a certainty in its effects which few, if any other, remedial agents possess, but I do say that in the class of cases of which I am now speaking it is too indiscriminately advised. I have known parties again and again sent away whose hearts were much degenerated at the time, and anyone in the habit of frequenting the watering-places must, I think, have seen at them cases such as I am now speaking of. They will be met walking about with the greatest deliberation and care, and are, as a matter of course, liable to sudden and even fatal attacks. I could, without any trouble, name cases who were so advised, and

even give instances where death came upon them before they reached their destination. I do not deny that the question of whether parties should be advised change of air may be a difficult one to decide—for every case must be considered on its own merits; but I do say that if parties cannot move about in a quiet way, and on a level, without exciting their breathing, they should not leave home. No air or change can make up for the comforts of "home, sweet home!"—to say nothing of the risks themselves. Even in cases where the heart is affected with fatty hypertrophy, and its muscular texture still comparatively sound, the question may arise whether the patient should be sent away. Certain it is I have known instances where the parties have returned without having been benefited. The explanation, I believe, is that patients thus sent away are very apt to try their constitution too much, and injury is the result. Besides, we must not forget what has been stated in an earlier part of this essay—that some cases run their course very much more rapidly than others. Now, such I would say should seldom, if ever, be sent away; the disease goes on steadily and rapidly, and I have seen cases where the entire duration was within a year. No doubt such cases are exceptional, but they do occur, and ought to be recognised—for change of air seems not to benefit them at all. They might be called acute cases, and the loss of flesh which they are apt to exhibit is a very striking symptom.

Of the frequency with which the liver is affected in fatty degeneration I need scarcely again speak. Out of 100 cases given by Ogle, where the heart was fatty, sixty-

eight—that is, two-thirds—presented fatty liver. Hence, when the heart is fatty, the chances are as two to one that the liver will be so too. Under these circumstances the organ is usually enlarged, and can be diagnosed as such—the amount of fat being the chief cause. Now, it is to be observed that this enlargement may disappear and then return, and the return to health may be directly due to treatment. The case of the late Mr. Colles himself is proof of this, for on different occasions his liver returned to the normal state, after having been distinctly enlarged; and it was mercury, used to salivation, which effected this change.* The details of this important case need not be given; but I would refer the reader to the graphic sketch which Stokes published in *The Dublin Journal of Medical Science*. My own experience has afforded me examples just like it, but I have not found it necessary to push the mercury to salivation; an alterative course was all that was required, and in some instances it was the bichloride was used. I have reason to believe mercury is not used in these cases as much as is required, yet given with ordinary caution it is, I believe, the most powerful agent we possess for combating the symptoms—which consist mainly of dyspnœa, more or less enlargement of the liver, a very marked diminution of the urine, which is high-coloured; and all these joined with the signs of a fatty heart. After the mercury has been given up,

* That there is also often congestion admits of no question, and it is more than probable that in the case given in the text it was the removal of the congestion which was effected by the treatment. Both the liver and heart were found to be fatty after death.

and sometimes together with it, diuretics will be found of great service.

When speaking of the etiology of fatty disease I had occasion to allude to the state called plethora. Now this state—which so often either precedes or accompanies a morbid deposit of fat—can, in its earlier stages at least, be certainly much modified by treatment, and I mention it in this place because the liver would appear to be the organ which is more especially involved. In a plethoric state of the system it is sure to be engorged, and this will give rise to sense of weight or uneasiness, sometimes amounting to pain. It is here that aperients, or purgatives, suited to each particular case, are of the greatest benefit, and with them a more moderate diet must be enjoined, and as active exercise as the party can bear. Cases do occur too where local bleeding affords the greatest relief, but it would be out of place to enter further into the treatment here. The dyspnœa so common in these cases would seem to be due to this state of the liver, so beneficial is this treatment in correcting it. I have seen one dose of purgative medicine apparently cure this state, and it did so certainly for the time; but unless the plan be steadily carried out by medicine, abstinence, exercise, &c., the state will surely reappear. It need scarcely be observed that it is in these cases hæmorrhoids so frequently exist. In my experience these very generally come on in a plethoric state of the system; the only exception to this is that constipation at times seems to be the direct existing cause. When hæmorrhoids bleed it may almost always be looked on as beneficial, and especially at an early

stage of the disease. In any aspect in which it can be viewed this state of plethora has the closest connexion with fatty growth; and as treatment, both medical and hygienic, affects it materially, it is of the more consequence that, as a state of the system, it should be sought for and clearly recognised. It is of every consequence too that the sense of weakness and depression so frequently attending it should not be mistaken for real weakness, and treated as such. It may be questioned whether this is not a very common error.

There is little to say about the affections the stomach exhibits in cases of the fatty diathesis. The digestive process, if not painful, is ever slow, and frequently attended with great fits of flatulence; and speaking of flatulence reminds me that in the earlier stages of angina pectoris the patient very often sets down the attack to wind in the stomach, for when it is got rid of the attack passes away. Hence they often learn to take a little peppermint-water, or something of the sort. In these cases the regulation of the food, and more particularly the mode of cooking it, is of more consequence than any pure physic. It often happens that the parties cannot chew it properly, and then the use of the mill is of much consequence. My own conviction is that this means might be more generally adopted than it is. Besides the cooking, the quantity should ever be moderate, and no solid food should be taken going to bed, nor for three hours before it. Change of air betters this state for the time, as do also tonics, of which every one will have their own favourite. I may mention that I have found rhubarb in very small doses, and given twice a

day before meals, of much service. Pepsine, too, in its different forms, is often of great use. It would, however, be out of place to enter further here into particulars.

Allusion has been made in an earlier part of this essay to a very much more serious state of the stomach than mere indigestion—I mean where vomiting of a very sudden and severe character comes on: frequently without any apparent cause. It is scarcely necessary to say that it is a very grave complication of the fatty diathesis, for the system generally is in such a weak condition that the shock of the vomiting cannot be borne, and death rapidly supervenes. It is a state, too, that I know may be overlooked—I mean the existence of the fatty heart with this kind of vomiting, and this adds to the difficulty of the treatment. I am not sure that I can give any hint in the way of treatment, except that when the ordinary remedies fail—and they are very apt to do so—it is well to stay all medicine by the mouth, and use it in other ways. I have known several remedies tried, one after the other, and with an aggravation of the vomiting, rather than any improvement; and, on the other hand, when complete rest was given to the stomach for some hours, it was then found it would retain what was taken. The theory I have formed myself about the state of the stomach in these cases is, that a severe form of congestion exists, but I am not able to state this from *post mortem* examination. At any rate, it was acting on this idea that all medicine was withheld for the time, and with good results. It is to be noted—as already, indeed, stated—that the vomiting may entirely cease, and not be re-

newed again—in other words, it is not necessarily a fatal symptom.

To the vomiting, however, may be added pain, and of a very violent kind—in fact, all the symptoms of gall-stone may be present, and, with the heart degenerated at the same time, the chances of recovery are then of the very slightest. I have myself seen no recovery under these circumstances. But I know some do recover. The complication is of a nature which calls for the utmost circumspection in the use of remedies, which, if the heart were sound, would certainly be given or used. The famous case to which I have before alluded, and which got into the public papers, is a striking example of this; and, under any circumstances, it is obvious that the heart must be kept acting, as far as lies in our power, at the same time that we use such anodynes as the case seems to require. These will include opium, ether, chloroform, the warm bath, &c., used in different ways. But I need not here go into particulars. I would repeat, however, that a great caution must be exercised in the use of the remedies just named.

Constipation might be described as being the rule in the class of cases of which I am speaking, and a large number of them are obliged to take purgative medicine almost daily. I have known parties who, for years, took an aperient pill every day. It is an advantage to combine it with a grain of the extract of nux vomica, and, where nothing exists to prevent it, the pill may be taken before dinner with advantage, as a smaller dose acts then better than if it were taken at night. When medicine in the

form of pill does not suit, I have found the compound decoction of aloes answer well, and the dose can be regulated with the greatest nicety. Spa waters have not answered, in my hands, at all as well as the aperients indicated, though I am aware they have been recommended by others. I am sure I have seen mischief arise from their use. A pill may be taken daily, as just stated, and for years, without any apparent injury. But this cannot be done with any spa with which I am acquainted; and yet it is a matter of necessity that some aperient should be daily taken, for one of the most important points to attend to in those cases where the heart is degenerated, is a daily action of the bowels. I need scarcely remind the reader of the great importance of avoiding everything which could cause straining, and especially at the water-closet. The number of persons who have died whilst straining is considerable. Amongst these I might cite the case of Abercrombie, who died in this way, and in whom a slight rupture of the heart had torn one of the veins, thus causing a fatal hæmorrhage. I believe that when parties die suddenly in this way the cause is much more frequently in the heart than the brain.

Before ending these desultory remarks on the treatment of fatty heart, I would ask attention to a phase of the subject which is well worthy of more notice than, as far as I am aware, it has yet received; nor do I know any point on which greater mistakes are likely to be, and are so often, made. I speak not only of the mode of death, but more particularly of the time when death might be expected to occur. There is, I believe, no

point in practical medicine about which greater mistakes than this are committed. I have myself frequently committed them, and I presume I address few who have not known examples of them. The remark, too, does not take in cases of fatty heart alone, but applies nearly to all diseases which may cause death. But in this place my remarks must be confined to those of fatty disease alone. And here I have known repeated instances of parties who were left to die, but survived long after this prognosis was given.

It is only a few hints I venture to give here as bearing on the period when death is about to occur. And, first, as to the animal heat. I have already spoken of this state as having the closest connexion with the fatty diathesis; and I allude to it again because, if it be not recognised, errors in the prognosis as regards the time of death are very likely indeed to occur. A physician is called to a case of the kind, and he finds the hands and feet cold as stones (as the expression is), and the patient, to all appearance, *in extremis*. Yet he will come out of this state, and rally, it may be, for months. Now, in such a case allowance has not been made for what might be called the natural state of the patient, which is one where the animal heat is constantly below par, and for which, as I have just said, allowance must be made. This state of the surface of the body is very characteristic of the fatty state, and it is worth noting that the patient is frequently not conscious of it—in other words, he does not complain of it. I have observed, too, in some cases, that while the feet kept fairly warm the knees were of a stony coldness. This seems contrary to

what might be expected, and yet it is the fact. It is further to be noted that if this state of low animal heat should, from any attack of inflammation, rise, so as to approach a feverish state, the fatal event is not far off.

The most important change, as regards the temperature, which occurs is, in my experience, in the breath. If it be cold to the hand I believe it is a very sure sign of approaching death; and as it is an easy symptom to recognise it is worth the keeping in mind. In connexion with the surface of the body perspiration frequently occurs. Every one knows that in very many diseases cold sweat is almost a constant symptom, coming on very near the end of life. But what is seen in the fatty diathesis is of a very different character; it is often most profuse, and may be warm to the hand, and it will recur again and again; and though I have seen no patient recover once this state had shown itself, still the same thing may go on for days, and in this way the patient may live. In nearly all these cases the brain became gradually involved, and the patients died in a state of coma. It is to be observed that these perspirations intermit, and between times the patient will be free of them. It is more than probable they are due to the state of the nerves themselves, and seem to me to constitute a part of the natural history of the fatty diathesis.

As to the pulse of fatty heart it may prove very deceptive. In some cases I have met it kept wonderfully regular and of a very fair strength up to the very last moment of existence. I admit this was exceptional, but it is important to keep it in mind. In other cases

when the pulse had become habitually slow, and as long as it continued so, life was comparatively safe—I say comparatively, for of course in no patient in this state is his life safe; but if the pulse, after having been slow, then rose to 100 or upwards, life might be considered in imminent danger. In a third class of cases the pulse is quick from the very first, and may, from this cause, throw us off our guard; but this is a state in which life may go on for a very considerable period without life being involved. When death is approaching this kind of pulse dies out literally at the wrist; but in this way a patient may live for many days without any pulse. Under these circumstances the stethoscope often becomes of great use, for on applying it over the heart it is common to find a morbid sound developed as death approaches. This is more common over the right than the left side; it is of the character of a *bruit de soufflet*, and is caused by the blood getting coagulated as the end approaches. It is not always to be found, obviously because the coagulum is not of the shape or size which is capable of developing sound.

Allusion has been already made to the fact that some of these patients die at a time when the pulse at the wrist keeps wonderfully regular and of fair strength. In such cases death has appeared to me to come more from the state of the lungs than the heart. The respirations get, as it were, shallower and shallower, and so life goes out. It is very possible in such cases that the lungs or their nervous supply are in a more advanced stage of disease than is the heart itself. It is very likely too that it is in such cases death occurs during

sleep, and that the "Cheyne-Stokes" breathing may have existed.

Irregularity of the pulse affords scarcely any assistance on the point of which I am now speaking. It is known to be a frequent attendant on fatty heart, and it is very remarkable to what an extent it will go, and how long it will continue, without life being involved. When a case of this kind is seen for the first time it is quite possible for the physician to be thrown off his guard, for the irregularity is so great that it would seem as if life could not by any possibility go on with such a state of the circulating system; yet we know, as a matter of fact, that it does go on, and for an unlimited period. The same thing may be seen in some cases of disease of the left auriculo-ventricular opening.

If, during sleep, moaning begin to show itself, it should put us on our guard; it seems to be a kind of instinct, as if the constitution were sounding the alarm that mischief was impending. It is to be noticed too that the patient is not at all aware of it, but it is none the less significant.

When the appetite comes to a complete stand it may be considered as of serious moment. Patients suffering from fatty disease have always seemed to me to be hearty eaters, and the cessation of appetite is possibly the more marked amongst such. With this loss of appetite the tongue very frequently gets furred; I do not speak here of the ordinary furring, such as is so common in nearly every acute disease, but a very much exaggerated state, in which the fur may be said to be quadrupled, so that it would be scarcely possible for more

to be heaped on it. When this is observed the danger to life becomes extreme, and death comes shortly.

If raving show itself at a time when there is no feverish state present, it may be looked on as of dangerous omen, but care should be taken that the raving be not due to strong drink, which, even in very moderate quantity, is capable of causing it. In the case of which I am speaking it is, of course, due to the blood not being properly oxygenated, and this is known to occur in other states besides where the fatty diathesis exists.

Of the time of the day when death occurs a few remarks will probably not be out of place. My own conviction is that more deaths occur during the night and early morning than at other periods of the day, but it would be a very difficult, if not impossible, point to prove. There are some considerations, however, which go to support this view. Thus, as night is the period for sleep, it is then that the patient may literally die in it—in the way and from the special cause to which I need not again revert. All are aware of the number of persons who are thus found dead in their beds; nor can it be too often repeated that in nearly every such instance the death is due to fatty degeneration of the heart. It was thus that Chalmers, the famous divine, died. He was found lying on his side, quite cold, with his arms folded on his breast; and, though he had discharged his stomach into a basin, it was clear he must afterwards have settled himself to sleep, for the bed-clothes were not disturbed. I myself have not seen any case of this kind in Simpson's, but I have elsewhere—in a woman who was my patient for some years before

her death, and in whom a very slow pulse became developed, if I may so say, under my very eyes. She had been in the habit of taking a cup of tea early in the morning, and then sleeping after it. On the morning of her death this had occurred, but when the time came that she should get up it was found she was dead. I saw her immediately, and found her lying on her side, her head resting on her hand, her expression calm—the very picture of natural sleep. From the position in which she lay, and the way in which the bed was fixed, no struggle of any kind could have occurred. A second reason why death may occur more frequently at night arises from the errors made as to diet. I have alluded to this already, and stated that late suppers are rarely taken without unpleasant results (to call it by the very mildest terms) supervening. None of the class of patients of whom I am speaking should ever take supper; and, indeed, I may say here that even a late dinner is to be avoided, for not only may angina-like symptoms ensue, but even death itself.

Some years since I attended a case of this kind, and I mention it here because the first attack proved fatal. A gentleman, aged seventy, I knew to have a fatty and degenerated heart. He had been my patient for many years, and had gone through all the phases of the disease. Within two years of his death arcus had appeared in each eye. Within this same period he had been able to walk to his place of worship, a distance of about 500 yards; but he invariably took a cab home. There was a slight incline to the church, and, of course, an ascent from it. On the evening before his death he had dined

later than usual, and had eaten a very hearty dinner. I saw him about eleven p.m., and found him suffering from difficult breathing, and he referred his distress to the lower part of the sternum. There was neither an expression of agony nor paleness in his face, nor did the breathing to the eye seem laboured. The ribs were ossified close to the sternum. He never had any morbid sound over the heart, nor was there any now, and the pulse was what would be called full, and but 84 in the minute. There was no intermission. The only thing which seemed abnormal was the respiration, for, on trying to listen to it, the air did not enter the lungs, it might be said, at all. Breathing could be heard, but of the very faintest; and if there be such a state as paralysis of the lungs this case was an example of it. Though I had the able assistance of the late Dr. Hutton, nothing seemed to afford relief, and the patient died at five in the morning, the attack having lasted about seven hours. In a similar case, again, I would certainly have recourse to the subcutaneous use of ether; but this was not known at the time. It may be mentioned that on my first seeing him the stomach had been emptied by a mustard emetic, and his dinner, nearly unchanged, had been thrown up. Though a failing man, he considered himself as well as usual on the day he took ill. His faculties were retained to the last moment, and he spoke of dying from the time the attack began.

But there are still other results which, even if more remote, I believe, follow irregularities in diet, and, though glanced at before, may be noticed again. A party with his heart degenerated eats supper, to which he is not

accustomed. He sleeps through the night, but awakes the next morning out of sorts. Now in such a state a casualty, if I may so call it, is very apt to occur—whilst dressing or shaving he suddenly falls in a faint, which may prove fatal. Nor is the explanation difficult, for life is held now by so thin a thread that a slight indigestion is capable of snapping it. The very healthiest amongst us will, after eating a supper which was unusual, feel depressed and weak the following day; and when this state arises in the fatty diathesis, serious mischief may, and often does, attend it.

A case of this kind came very recently under my notice. In October, 1879, I was sent for in all haste to see a man, aged sixty-five, who was said to have had a fit. He had been a patient of mine some five years previously in the Whitworth Hospital, and laboured then under a severe attack of pneumonia. He was a perfectly sober man, but a most inveterate smoker.* Between the attack of pneumonia and that for which I was sent for I had not seen him as a patient; but as I met him constantly, and, indeed, employed him in my own house, I could not help being struck with the great change which was taking place in his appearance, and more particularly within the last two years. I need not describe these changes, except to say that arcus developed itself with great rapidity, and of so white a colour as to cause disfigurement. When I reached him he was quite dead. I learned he had slept well and risen at his usual hour, and that he was in the act of dressing, but

* Dr. Johnston knew this patient, and had often warned him against smoking.

only half dressed, when a desire seemed to come on him to go to the closet. He had not quite reached it when he fell, and, after two or three gasps, expired. He had not soiled himself in any way. I further learned that—what was most unusual with him—he had supped heartily the night before off cold meat and potatoes. This may have been a mere coincidence, and some will think so, but for myself I cannot so consider it, and I believe the case to have been a very good example of the point I am endeavouring to establish.

In connexion with the time of the day at which most people suffering from fatty heart die, breakfast remains to be noticed. Not that there is anything in this meal to object to, but that very many of the public then act in a way which is injurious to their health. With how many is it a hurried meal? or, if there be no hurry during the meal, how many start off the instant it is swallowed on their daily business? And as so many now live out of cities they must of necessity be brought into town, which entails—frequently entails—running to catch the tramcar or the railway. It is surely no wonder that, under such circumstances, parties with weakened hearts should suffer seriously, or even die; and if it so happen that animal food has been taken, it only makes matters worse. Allusion has been already made to two parties who had acted in the way indicated, and who started just after their breakfasts. They both fell as if they were shot, and though they recovered it was after a long period. In one it was the first intimation of his having fatty heart.

Lastly, it may be noticed that it is in the morning

the great majority attend to the calls of nature, and I need not tell the reader of the very large number who have been struck down in the very act of straining—some with paralysis, some with coma, some in a fit of syncope, and some from rupture of the heart, of which latter I have already quoted the case of Abercrombie.

Taking all these facts into consideration, I think they point strongly to the conclusion that more deaths from fatty heart occur during the night and morning than at other periods of the day. Nor is this part of the subject without importance, and particularly in a preventive point of view, and as regards the management of the patient, but my space does not allow of my entering further into it here.

Besides the purely physical causes which lead to sudden death, of which I have been speaking, I need scarcely add that mental causes also play a very important part; and these may arise at any moment. A continuous mental strain, or worry, or a fit of passion, have each been recognised as direct causes of death. But, though recognised by many writers, it may be questioned whether they have been placed in the prominent position to which they are entitled. Our advancing knowledge, however, of fatty disease will shortly determine their great value.

Before bringing this essay to a conclusion—and, from the extent of the subject I find I have written more of what might be called *disjecta membra* than an essay—I would wish to make a few general remarks. The reader of the foregoing pages will have observed that the leading idea through the whole of them has been to show

the widespread character of fatty disease, and that in future no single organ is to be considered to the exclusion of the rest; and so with this essay, which, though entitled "Observations on Fatty Heart," I would wish to be understood as—in one point of view, at least—including the entire frame. If this view be not accepted, I believe that the gravest mistakes must ensue. I might illustrate this by the fact to which attention has been already drawn, and more than once—I mean the number of cases where cerebral symptoms are the first to be noticed, the heart at the same time being involved in fatty disease; or the occurrence of hæmorrhages, which so often play an important part in the diathesis; or the question whether the diaphragm is involved or not—one of the most important which can arise, whether as regards the duration of the complaint or the suffering of the patient; or, lastly, the idea—of which more decided proof is yet needed—that the nerves themselves are frequently the first attacked with fatty disease. That they are sometimes diseased is certain, but I believe disease in them is much more common than is usually thought, and the idea certainly explains some facts which otherwise seem hard to account for. I might adduce the slow pulse which sometimes is present in fatty heart. That it is not dependent on the state of the heart itself I take to be certain, else it would be very much more common than it is. But if we suppose the inhibitory nerves to become diseased, the slow pulse then is readily explained, and this, I believe, is the correct view of the matter.

From this general consideration of the subject, too,

some other deductions may, I think, be fairly made. Thus the disease known as "pernicious anæmia," about which so much has been lately written, may surely be classed as a fatty disease. I am not certain but that this has been done already, though I am unable to refer to the author. It seems to me, too, that the special attention given to the state of the bones and marrow is a mistake. To my mind these changes constitute but a part—a very small part—of a general diathesis, and the state of the marrow ought not, from any point of view, to be considered as a cause of the disease. It may be admitted that this "pernicious anæmia" is a distinct variety of fatty disease. It occurs at an earlier period of life, and runs a more steady and more rapidly fatal course. But, further than this, it seems to me not to differ from the more ordinary, and much more frequent, forms of disease.

The general view of the subject of which I am now speaking also suggests the question—How far is the disease, known by the title "General Paralysis of the Insane," a form of fatty disease? This affection, as we know, frequently begins with symptoms far removed from those referable to the heart—it may be in the limbs, or about the mouth. But we also know, too, that its morbid anatomy is very closely mixed up with fatty disease, and that in it, beyond the others, the nerves themselves have often exhibited fatty change. At any rate, whether we view "pernicious anæmia" and "the paralysis of the insane" as being closely or more remotely connected with the ordinary forms of fatty disease, it is clear that one can be badly studied without

taking full account of the others, and that the grouping together of the three must tend to advance our general knowledge of the whole subject.

Lastly, in taking the widest view possible of fatty disease, I am sure we have the best guide possible for its rational management and most successful treatment. I use the word "management" advisedly, because there is, in every case, a great deal to be considered which does not come strictly under the head of treatment.

THE END.

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