

presence in the glandular structures is, I conceive, necessary to constitute Scrofula. Again, I say, the condition of the system favorable to this deposit is marked by *no certain* external signs, up to the moment when the glands become tumid. The child may be fair or dark, pallid or ruddy, well fed, clad, and lodged, or all these may be the worst possible; he may be the child of wealth or of poverty; he may live in town or country; he may be the child of old or young, of healthy or sickly parents; he may be born and live within the tropics, or in the arctic circle; under all these circumstances, as we shall see hereafter, Scrofula may be developed. What circumstances tend most to its production, we shall endeavor to shew when we come to the study of causes.

At the same time, we are bound to admit that the condition of the system which we have described as indicating the predisposition to Scrofula, is one which favors the deposit of the particular product in many parts of the body; in one case, in one organ; another, in another. If, for experiment, two animals be submitted to the influence of exactly the same causes of evil, the results of that influence will probably be very different. In one instance a particular organ is the principal sufferer; in another, the same organ has escaped comparatively free from disease; and it is often difficult to assign any explanation why these results should differ so widely from each other. But it is certain that most morbid deposits are the result of perverted nutrition; and when the condition is developed which is favorable to their production, particular circumstances will determine them upon one organ or another.

CHAPTER III.

THE SCROFULOUS DEPOSIT—ITS PHYSICAL CHARACTERS.

WE have spoken at sufficient length of that state of the constitution which is supposed to favour the deposit of scrofulous matter, and we will proceed to inquire what are the characters of that product itself.

It is believed that scrofulous matter may be deposited in many of the structures of the body, and supposing that opinion to be correct, it is pretty certain that it will vary in appearance with the varieties of the structure of the organs in which it may be deposited; but as we define Scrofula to be a disease, manifested by a peculiar deposit in the subcutaneous lymphatic glands, it is in them that we should first examine the product in question.

When a gland is about to become the receptacle of such matter, it undergoes a change in structure, dependent on increased action alone, and certainly irrespective of the character of the deposit. In the glands so changed, the matter is deposited, it may be, at several points; those points enlarge, and may ultimately coalesce, and the intermediate tissue of the gland may disappear. At an early period, it sometimes happens, in lymphatic ganglia, but this is very unfrequent, that the matter presents an appearance not unlike that of the grey, translucent, tubercle-like matter found in the lungs. The common rule observed in lymphatic ganglia, however, is to present no intermediate stage between the development of simple enlargement and induration, accompanied by increased vascularity in the gland, and the occurrence of the deposit of opaque scrofulous matter. To the naked eye, this matter is presented in the form of an amorphous, greyish, buffish, or yellowish mass, irregularly granular, and not unlike moist old cheese.

The microscopical characters of scrofulous matter are thus described by Albers: "The tubercle presents, under the micro-

scope, separate minute tubes, which under a linear enlargement of five hundred and fifty times, prove to be cells; this is not the case with scrofulous matter, which is granular.* Bredow says, that when examined with a microscope, he found, that scrofulous matter like all organic products, was composed of innumerable small globules, which had no organic connection with surrounding parts. Ruette found, under a power of four hundred, that the single globules, which are a little larger than blood globules, consist of a capsule, with a nucleus. Several times he thought some of them burst and shrivelled. Bredow could not distinguish those capsules. He thought, on the contrary, that these globules were at first transparent, but that they gradually became opaque.

Mr. Dalrymple, who has kindly made for me microscopical examinations having reference to this subject, says: "The whole material is composed of disintegrated tissue, granular molecules, irregular exudation corpuscles, and in which the nucleolus is seldom to be recognised, and a considerable quantity of oil globules, which may be abstracted by boiling in æther, and recovered by evaporation on a plate of glass.

"In acute or chronic inflammation of the glands, in otherwise healthy subjects, in whom no particular morbid disposition exists, the exudation corpuscles, by what appears to be a law of vitality, proceeds to the development of a cyst around the nucleus, or cyto-blast; and this nucleus even splits into two or more, and hence a pus globule is formed. At this point, however, the process stops, and the pus globule subsequently disintegrates, and is resolved into granular and fluid matter. During the development of the cell and fissure of the nucleus, a pus globule may be said to be an organic and vitalized body, deriving its means of increase from the blastema around.

"The exudation corpuscle, however, is capable of a much higher degree of organization, and under favourable circumstances, the cell germ produces its cell, the cell elongates, and either fibre or filament is produced, as in the healing of a wound.

"In this scrofulous matter it appears that the exudation corpuscles do not possess even that feeble vital power, which induces the

* See Appendix.

further change into pus, and therefore it passes from the nucleolated cyto-blast into an irregular granular body, (disintegrated), the elements of which, by some further chemico-vital process, resolve partially into oil, or fat globules."

Mr. Gulliver's observations upon tuberculous and scrofulous matter have been very extensive. He has kindly examined a large number of specimens sent him from the St. Mary-le-bone Infirmary, and the following are the results which he has been good enough to communicate to me.

"In the human subject, it appears to me that crude tubercular matter, from whatever organ obtained, differs as little in its microscopical as in its general and chemical characters. When examined by the aid of the microscope, crude tubercular matter can scarcely be said to present any regular structure, as it is merely made up of minutely granular matter, oily spherules, some shapeless albuminous flakes, or shreds, and a few irregular corpuscles; the latter are probably nothing but effete, or shrunken primary cells."

CHEMICAL CHARACTERS.

The analyses which have been made of the chemical characters of scrofulous matter, do little more than prove that it is mainly composed of albumen, fat or oil globules, and certain alkaline salts. In one case there appears to be a little more, in another a little less, of those materials, and I have had the quantitative analysis very differently given when the matter has been taken from the same body.

Hecht says: "If we take a large lymphatic gland, altered in structure and converted into a mass of scrofulous matter, the whole mass seems homogeneous, and of the same yellowish or dirty white colour; towards the centre, the mass is softer and of a creamy, pulpy appearance. The softened pulp turns litmus paper green; acted upon by boiling water, or acids, it coagulates, presenting no globule either of fibrin or of pus, and is apparently only a mass of coagulated albumen, with an excess of alkaline salts. But when inflammation is excited by its presence, pus may be found mixed with the matter. Before this matter has undergone softening, a viscous fluid can be expressed, which coagulates by heat and a white flocculent matter is precipitated. This precipitate, insoluble

in alcohol or æther, is albumen, for if the matter be treated before coagulation with nitric acid, a yellow flocculent precipitate is thrown down; acted upon by chlorine it becomes pearly white in colour, and a white precipitate results; treated by nitrate of silver, a reddish brown precipitate is thrown down, and this is insoluble in ammonia. It contains some gelatine and fibrin, and probably a little stearine."

Prout regards this matter as albumen, incompletely developed. Gendrin as a mass of albumen, with excess of salts. L'Héritier found it to contain albumen, very soft fibrin, some fatty matter, and carbonate and phosphate of lime. Bredow regards the matter as albuminate of potash, or soda.

So far as to the physical and chemical properties of scrofulous deposits, which although varying with the particular structure of the organ, yet in so far as concerns a simple inspection, present considerable uniformity, and they do not yield any uniformly differential character when subjected to minute analysis, either by the microscope or by chemistry.

CHAPTER IV.

STATE OF THE ORGAN IN WHICH THE PRODUCT IS ABOUT TO BE DEPOSITED.

WE have considered the state of the constitution which favours the development of the scrofulous product; and the physical and chemical characters of the product itself; and we may now inquire whether there be any uniform change determined in the organ, in which the product is deposited, before that deposit is accomplished.

Commonly, if not always, glandular structures do undergo considerable change before scrofulous matter is deposited in them. They acquire a considerable increase in volume, in density, and in vascularity. The bulk may be ten or twenty times what is natural to them, the density may equal or exceed that of veal, and the change of colour from increased vascularity is very remarkable.

A point of considerable interest is here presented. Is this state of the gland determined by the circulation within it of blood which has undergone change, or is it independent of the blood? Does the blood fit the organ to receive the deposit, or does the organ fit itself? This is an important question, but of very difficult solution. Important too, with reference to treatment; because if the action set up were purely local, means might be taken to change it, and render it unfit for the deposit. If the action depend only upon a general contamination of the blood, how comes it that all the lymphatic glands are not equally affected? It is notorious that they are not. The bronchial glands are affected more than twice as often as those of the mesentery, the latter four times as often as those of the neck, though in many respects least exposed, and the last named glands four times as often as those of the axilla and the groin. There must be a reason for this. It may be that the cause of the greater frequency in the glands of the mesentery, is the irrita-

tion set up in them by depraved chyle, the result of bad food or improper feeding; which state may be kept up until the blood is sufficiently charged with improper materials to occasion a deposit to be made; and I apprehend the cause of the greater frequency of the deposit in the cervical than in the inguinal or axillary glands, is that they are more exposed to alternations of temperature and to irritation; that, therefore, *cæteris paribus*, under the same amount of constitutional irritation, congestion is more rapidly developed in them, and therefore the deposit is more frequently found in their substance.

Mr. Dalrymple, after a careful examination of a scrofulous cervical gland, says; "This enlarged gland appears to consist of a general parenchyma in a state of chronic inflammation, surrounding irregular masses of yellowish white matter, more immediately the subject of examination. In direct proximity to the edges of this white material, the blood vessels are seen to be more enlarged and congested than elsewhere, and in some parts, the capillaries are occluded with coagulated blood. The parenchyma, at first sight appears healthy, is, on examination with high powers, found to be infiltrated with exudation corpuscles, resembling lymph globules. The natural texture of the gland consists of its proper corpuscles, filamentous tissue, blood vessels, lymphatics, and nerves. In this morbid specimen, every where is the filamentous tissue infiltrated, and its fibres separated by innumerable exudation corpuscles, and the proper corpuscles of the gland are similarly surrounded and imbedded,* As the parenchyma is nearer to the white matter, so proportionally do the proper corpuscles of the gland become more indistinct, the filamentous tissue more obscure, the blood vessels irregularly dilated and filled with red globules, and they at last disappear insensibly. The exudation corpuscles are more numerous, but irregular in size and shape, and interspersed with minutely granular matter."

Whether the state of hypertrophy, with increased vascularity, be inflammatory in its nature, will be differently decided by different people; but as exudation corpuscles can be detected before any scrofulous matter is deposited, I think we ought not to refuse to admit the existence of inflammatory action. That Broussais should have so regarded it is not perhaps to be wondered at. "Never,"

* See Plate, fig. 1.

says he, "are lymphatic ganglia tumefied, indurated, or softened, without an exaltation of their irritability and their contractibility; that is to say by irritation, which is sub-inflammation."*

That some persons will explain this altered condition of the gland in a different way to what I have done is possible. But I do not care how it is explained;—the fact that the organ is so changed is all upon which I insist. This congested, inflamed or hypertrophied condition of the subcutaneous glands is of very frequent occurrence. It can be detected in one fifth to one sixth of the juvenile population of this country. If we examine the necks of delicate children, we very commonly observe that the lymphatic glands in this region are enlarged. In the state of health, the eye and the finger fail to detect them at all, and when they are thus cognizable, the proof is complete that they have undergone the change of structure to which I have referred. A tumor of considerable size may result from the aggregation of a cluster, or a chain of such glands; that tumor may completely subside, so as to leave no trace of its existence behind it, and this is the result in probably nine cases out of ten where such swellings have been observed. This is proved by the fact that they are enlarged so as to be felt in more than 20 per cent. of the juvenile population in England and Wales, and that they are not found to proceed to suppuration in more than 2 per cent. of that population; and I regard this fact as a satisfactory proof of two circumstances—the hypertrophied, or inflamed condition on the one hand, and its entire subsidence on the other. And that subsidence I assume to be a proof that no scrofulous matter was deposited, because I have no reason to think that when scrofulous matter is deposited in any structure, it can be removed by any process of absorption; therefore, when the deposit has once taken place, the swelling it occasions must remain until the matter is ejected, because complete recession does not take place while the deposit is present in the part.

In cases of swelled glands, when I have had an opportunity of examining them after death, I have found the tumor to be formed of an aggregation of enlarged ganglia which were harder and more vascular than natural, and I have often made the most minute in-

* Examen, tome 1., proposition 18.

spection without detecting the smallest particle of scrofulous matter in them, yet if diseased action be kept up long enough, the deposit will almost certainly take place. If we look at a similar state of things in the mesentery, we may see a great number of the glands enlarged and reddened by increased vascularity; some may be as large as a horse bean, or even larger, but when cut into, no deposit may be found in them, and yet here and there we find one, it may be, not harder, nor larger, nor redder than some others in which we find the matter deposited. I conclude that the particular gland has suffered longer than those in which there is no deposit. Generally, it is in the largest and reddest gland that the deposit is found. I, therefore, hold that we have satisfactory proof that before scrofulous matter is deposited in a gland, the organ has undergone considerable change of structure; but I cannot determine whether it be a consequence of the state of the blood, or independent of any change in that fluid.

CHAPTER V.

SOURCE FROM WHENCE SCROFULOUS MATTER IS DERIVED.

THE conviction which the ancients entertained, that Scrofulous matter was thickened lymph, made it a matter of great importance to them to discover agents by which they could thin it, and purgatives and alkalies were supposed to have that power, and were largely administered. In the present day, a different opinion is entertained of the source from whence scrofulous matter is derived; but it is important that we should satisfy ourselves as far as is possible from whence it comes, because in that case we may be able to carry out, with more effect, what they desired to accomplish—the cure of the disease.

The old idea of scrofulous glands was, that the matter deposited in them was left there by the lymph, or pituita, or chyle, in its passage through them; but then it was assumed that the lymph had previously undergone change, had become gypseous, fatty and viscid; and as it had become too gross to pass through the channels in the gland, it accumulated, became concrete, and in this way the glandular tumor was formed.

The prevailing opinion in the present day is opposed to the Hippocratic notion, and for this, as for most other deposits, we are disposed to look to the blood. But before we do so, it is proper to inquire whether there be any foundation for the notion that scrofulous tumors are ever produced by thickened lymph.

In the composition of healthy lymph, there is nothing repugnant to the belief that scrofulous matter may result from the inspissation of that fluid. L'Héritier analyzed lymph taken from the thoracic duct of a man who, for thirty hours before his death, drank nothing but water. He found that it contained: