and often in so many different tissues, almost at the same moment of time, as we find in tuberculous diseases, unless something more than a local action was at work to determine the deposit.

But having come to this point, we must now stop. We cannot prove whether the process under which the deposit occurs be one of secretion or excretion—whether it occurs in virtue of some peculiar action developed in part, and causing a new combination between the constituents of healthy blood—or whether it is owing to the blood having undergone the change before it has ceased to circulate, becoming overcharged with albumen and salts, and ready, when the ordinary excreting organs do not carry them off, to deposit them anywhere, and wholly independent of local action. However, so much may, I think, be fairly assumed, that the blood is changed before the deposit is made, that the accumulation of certain morbid materials in the blood constitutes what is known as the scrofulous diathesis or constitution, and that their deposition in the subcutaneous lymphatic glands constitutes what we know as Scrofula.

CHAPTER VI.

ARE PULMONARY TUBERCLE, OR PHTHISIS, AND SCROFULA IN THEIR NATURE IDENTICAL ?

In the chapter which contains our definition of Scrofula, we have restricted the term to a condition of the system, manifested, particularly, by certain deposits in the subcutaneous lymphatic ganglia. Although that view of Scrofula excluded Pulmonary Phthisis from any necessary connection with our subject, the commonly received opinion of their indentity is so strong, that I do not feel justified in passing it by without consideration. In its narrowest shape, the question is this, are tubercular disease of the lung, and scrofulous disease of the subcutaneous glands, identical in all other respects than in the seat of the deposit? The prevailing opinion certainly favours that belief; which rests on the following grounds, namely: that the deposit itself and the circumstances under which it occurs are said to be identical, and that Phthisis is only a more advanced stage in the development of Scrofula. It is unnecessary to refer to the names of those who advocate that opinion, but it is incumbent upon me to consider the reasons which have been adduced in its support.

As Roche* has clearly stated the case in favour of this alleged identity, I shall simply adduce the reasons which he has given in support of the opinion. He maintains that Phthisis and Scrofula are in their nature perfectly identical, the only difference being, as he states, in the seat of the deposit; that the same temperament and the same peculiarities of age and sex, predispose persons to contract both those diseases; that they offer the same anatomical lesions; that

* Dictionnaire de Medecine et Chirurgie partique, Art. Phthisie 15 vols. 8vo. Paris, 1835—1842.

when Scrofula has existed long, the signs of Phthisis are almost sure to appear; and that almost all the children who die of Scrofula or Tabes Mesenterica, are at the same time phthisical. Reid regarded the difference between the two affections as one of degree only; Phthisis being the highest stage in the development of Scrofula. In this view of the case, a scrofulous childhood predicates a phthisical manhood. Carmichael thinks that the children of phthisical persons are, as it were, devoted to Scrofula, though he does not admit the identity of Scrofula and Tubercular Phthisis.

As those statements are made without the production of the evidence upon which I conclude they are founded; we must examine the subject on its own merits. Our attention will first be directed to the characters of the product deposited in Phthisis and Scrofula, and the condition of the part in which the deposit is made; we will then proceed to ascertain whether the circumstances under which the deposit is made are identical; whether it occurs at the same period of life, and whether it falls with equal severity on both sexes; whether, where one of these affections is largely prevalent, the other keeps pace with it; and whether those who die of Phthisis bear in their bodies the marks of Scrofula; because if in most of these respects a kind of antagonism between these affections can be demonstrated, a conviction must then be induced, that how strong soever may be the resemblance in the general characters of those diseases, the points of difference are certainly not unimportant. And even if we should come to the conclusion, that in their nature these affections are identical, it might still be imprudent to lose sight of Scrofula, as a term well known, to indicate a particular form of tubercular disease.

First, we will consider the physical and chemical characters of the two products; and we will take tubercular matter, such as is found in the lungs, on the one hand, and scrofulous matter, such as is found in the subcutaneous glands, on the other, for the purpose of the comparison. I do this because we are considering whether Phthisis, which I prefer to regard as a tubercular disease of the lung itself, and Scrofula, which I define to be a disease of subcutaneous lymphatic glands, be in their nature identical. I exclude, therefore, from the present inquiry, disease of the mesenteric, the bronchial and other glands existing in the thoracic or abdominal cavities, because I wish to consider Phthisis and Scrofula under their most decided characters.

DIFFERENCES COGNISABLE BY THE UNAIDED SENSES.

When examined by the naked eye, no very remarkable difference can be detected between the two deposits; at the same time, I entirely concur in the opinion of that accurate observer, Dr. Hodgkin, who says: "I am sorry that I am not able to give thee a satisfactory reply to thy query upon the tubercle and scrofulous glands, not having sufficiently availed myself of opportunities to examine the two microscopically. The deposits which we meet with in both situations present differences of which the naked eye can, to a certain extent, take cognizance. My own present idea is, that we may certainly find chronically enlarged lymphatic glands in which the deposit is decidedly different from that of the tubercles of Phthisis, but that there are other cases in which I should have at present a difficulty in making a distinction."

To a certain extent, the difference which is often apparent between these deposits is owing to the difference of structure of the organs in which they are found, but I have very rarely known scrofulous deposits, in the subcutaneous glands, to present the characters which are so often apparent in the early stages of tubercle development in the lungs—I mean the grey, smooth, translucent appearance; this is more frequently seen in the mesenteric and bronchial glands. At a later period, that when softening occurs, for instance, it is doubtful whether any well-marked distinction can be made besides that which is dependent upon the difference of structure of the organ; certainly the point at which the softening commences is no sufficient test, although some persons maintain that in one the softening commences at the centre, in the other at the circumference of the deposit.

Albers conceives that differences in the physical characters of the deposits are demonstrable, and that the doubts which exist on this subject are owing to a too limited examination of them. He admits, it is true, that chemical analysis demonstrates no essential difference in the material elements; but he upholds the opinions of the older physicians, who maintained that a decided difference ex-

isted between Scrofula and Phthisis, though they have nowhere pointed out its nature.

Lebert, in speaking of the tuberculisation of lymphatic ganglia; says: "Tubercles of lymphatic glands may be classed in the three following categories; bronchial tubercles, mesenteric tubercles, tubercles of superficial glands; and between them, although possessing general features of resemblance, there are marked differences. Tubercles of the mesenteric glands are less frequently softened and surrounded with suppuration than those of the neck; bronchial tubercles often become cretaceous, those of the mesentery do so not unfrequently; subcutaneous ones do so but very rarely, but they have a tendency to suppurate. The tubercular matter, however, is the same in the glands as elsewhere—the same forms, the same elements. The vascularity around tubercles is sometimes largely developed in external glands. Diseases which are commonly regarded as scrofulous, may be ranged under three categories: chronic inflammations, in which nothing specific can be detected, and which are not really scrofulous; scrofulous diseases, properly so called; tubercular diseases, which though having a great analogy with Scrofula, ought to be separated from it as well for clinical as pathological reasons. I believe scrofulous and tubercular diseases have a certain connexion, that they depend on a dyscracic state of the blood, which is, in both cases, either identical, or, at least, analogous. I regard scrofulous diseases, neither as simple chronic inflammation, nor as a form of tubercular disease; and I believe in the essentiality of Scrofula. Tubercular diseases, on the contrary, appear in many circumstances to constitute rather a form of scrofulous disease."

DIFFERENCES DETECTED BY THE MICROSCOPE.

Believing that material distinctions between the two products could be made, though not satisfactorily, by our unaided senses, Albers had recourse to the microscope, and he conceives that by this means a distinct demarcation can be drawn between them. He found that: "Tubercular matter under the microscope presents separate minute tubes, which under a linear power of five hundred and fifty diameters, prove to be ranges of cells; and this is

not the case in scrofulous matter." M. Sandras communicated to the Académie Royale de Médecine the following observation: "That in Tubercular Phthisis the globules of tubercular matter are covered by a tomentous layer, which cannot be removed by washing, and that he has not discovered similar coverings in those found in Tubercular Ganglia."

Mr. Gulliver, who has examined a large number of specimens, in which deposits existed in the lungs, the liver, the kidney, the spleen, the internal and external lymphatic ganglia, has discovered no such appearances as those pointed out either by Albers or Sandras. He says: "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. The drawing* shows how nearly the microscopic elements composing crude tubercle of the lungs and of the lymphatic glands agree. All the objects are magnified about six hundred and eighty times, linear admeasurement. In the upper part, *a*, is depicted tubercle from the lung of a man, aged twenty-four, who died of the disease; in the lower part, *b*, tubercle from a subcutaneous gland of the neck of a boy, aged nine, who died of Scrofula affecting the superficial glands, membranes of the brain, and the spleen; his lungs contained only a few small tubercles." Other observers have come to similar conclusions. Mr. Dalrymple thinks that oil globules are more predominant in scrofulous than in tuberculous matter, but with that exception he knows no difference in the microscopical character of the two products.

Still, however general the opinion of microscopists may be that in appearance these products are identical, there are not wanting men of ability who maintain an opposite opinion, though the grounds for their opinion are not fully stated. In March, 1844, a paper was read at the Institute of France, having for title, "Microscopical and Physiological Researches on Tuberculisation." In that paper M. Lebert says: "It is proper to separate from scrofulous diseases, tubercular affections, as well as chronic inflammation of the eyes, of the glands, of the skin, of the bones, and of the joints, in which, by an attentive examination, the particular

* See Plate, Fig. 2.

dyscracic element cannot be discovered. In a word, the rigorous determination of the characters proper to Scrofula, is becoming an urgent desideratum in science." Again, the subject named by the Académie Royale de Médicine, for the Portal prize for 1845, is "The Analogies and the Differences between Tubercles and Scrofula." It is evident, therefore, that all men of science are not agreed, that the product deposited in scrofulous glands presents characters which are apparently identical with those of the tuberculous matter in Pulmonary Phthisis.

CHEMICAL DIFFERENCES.

The chemical analysis of those products does not determine any clear distinction between them; the essential elements are, as nearly as may be, the same in both. As much dfference has been apparent in two analyses of tuberculous matter taken from the same lung, as between scrofulous and tuberculous matter taken from the same person. Prout says, that these products are mainly composed of incompletely developed albumen, with some salts; Thénard, that tubercular matter is composed of 0.9815 organic matter, and 0.0185 salts; Hecht says that scrofulous matter contains 0.30 fibrin, 0.23 albumen, 0.27 gelatine, 0.27 water; Gendrin says that both products are mixtures of albumen with excess of salts; Bredow says that they are an albuminate of potash, or soda, with a little fibrin, and phosphate and carbonate of lime; Preuss says that there is, in addition, cholesterine and caseum; Boudet says, that they are composed of albumen, caseine, and a substance analogous to fibrin, certain acids, fatty matter, cholesterine and salts;—so various are the results obtained from the analyses which have been made of tuberculous matter taken from the lungs, and of scrofulous matter taken from a subcutaneous gland. The differences seem to depend, to a certain extent, upon the operator, and to a further extent upon the product itself, but no one has, so far as I know, established any uniform chemical difference between tuberculous and scrofulous matter.

I believe that the chemical composition of tuberculous and scrofulous matter is scarcely less variable than its physical appearances and properties; and that they are modified by the period of development, the seat of the deposit, and, to some extent, by the mode of examination.

Whatever expectations we may have indulged from the use of the microscope, and from chemistry, as means of unravelling the difficulties which are presented by diseased structures, it is certain that up to the present moment those expectations have been frequently disappointed; still, in the present imperfect state of this method of investigation, the employment of those agents must not be abandoned, even though by the assistance of the one, we may be unable to distinguish between pus and mucus; or by the other, between a malignant and non-malignant product, or between tuberculous and scrofulous matter.

In so far then as concerns the physical and chemical qualities of scrofulous and tuberculous matter, we can, at present, draw no distinct line of difference between those products.

DIFFERENCE IN THE CONDITION OF THE PART IN WHICH THE DEPOSIT IS MADE.

There is another question of much importance in estimating the alleged identity of Scrofula and Phthisis, and that is the condition of the part in which the deposit is made. The many opportunities I have had for examining lymphatic glands, before and after scrofulous matter has been deposited in them, have satisfied my mind that before the gland receives the deposit, it undergoes considerable change; it becomes enlarged, its vascularity is much increased, and its consistency is almost flesh like; this change in its condition I conceive to be the result of inflammation. In this respect, then, there is a marked difference between scrofulous deposits in glands, and tuberculous deposits in the lung. I am aware that considerable difference of opinion has existed relative to the state of the lung at the point where tuberculous matter is deposited; yet few persons will be prepared to maintain that the deposit is commonly preceded by Pneumonia. The older authors seem to have thought the presence of inflammation necessary for the development of all accidental productions, and this idea was supported by Broussias; few, however, of the more accurate observers of the present day are inclined to doubt but that tuberculous

matter is usually deposited in the lung unaccompanied by any sign of inflammation, or even active hyperemia. We have clearly no right, then, to assume the existence of antecedent inflammation, when we find the pulmonary tissue around a tubercle apparently quite healthy. I do not advocate the opinion that tubercles may not be developed as a consequence of information, when a predisposition exists, or that a period does not arise in the progress of tubercular development, when a certain amount of irritation or of inflammation may be set up in the surrounding tissue. All that I desire to express is, that alone, and in the absence of all other causes, inflammatory action does not seem capable of generating tuberculous matter, and that there is no proof that inflammatory action in the lung usually precedes the deposit of such matter.

If the correctness of these views be admitted, it is evident that, in the necessity of a change in the organ in which the deposit is made, in the one case, and in the absence of any similar change in the other, we have established one important difference between Tubercular Phthisis and Scrofula.

DIFFERENCE AS TO VASCULARITY OF THE PRODUCT.

Again, there is a question as to the vascularity, or at least premeability to injection of these products. Carmichael maintained that scrofulous glands could be injected, and that the injection pervaded every part of them, with the exception of the curd and whey-like matter, and that tubercles could not be injected. This point was put forth by Sebastian and by Dr. Stark, and by Sömmering,* whose observations, however, seem to have been a good deal confined to the lymphatics of the mesentery. Macartney† states, that he had succeeded in injecting tubercle. Dr. Kingston says he has observed blood-vessels in tubercles;‡ but these facts stand almost alone, though they receive some support from the observations of Schönlein who says that, "Tubercles have always determined organs of nutrition, either a cyst or an involucrum, the vessels passing into each being a central one, with ramifications in

* Baillie's Morbid Anatomy. † Carmichæl, p. 52.

‡ Medica-Chirurgical Transactions, vol. xx.

two directions," and he maintains that scrofulous deposits are similarly provided. Albers says, that "scrofulous swellings have always around them, and in their parenchyma, blood-vessels which pass directly into them from the cellular tissue. The tubercle frequently forms around itself a cawl of vessels which are found in a fibrinous layer which separates it from the lung itself. Blood-vessels pass but rarely into a tubercle."

Bredow, on the contrary, says that neither tuberculous nor scrofulous deposits can be injected. He maintains that the vessels, found at an early period passing into scrofulous glands, belong to the gland itself, and not to the scrofulous matter.

I have been unable to inject tuberculous matter in the lungs, or scrofulous matter in a gland; but the appearance of the part, upon a simple inspection, may now and then lead to the belief that the injection has succeeded. In a scrofulous gland, the matter may be deposited at several points, and ultimately those points may come so nearly in contact, as to impress a casual observer with an idea, that the glandular structure has been destroyed, or converted into scrofulous matter; and with that impression, if the injection passed into the gland, it might be assumed that scrofulous matter underwent organization—was vascular. But in every case in which I have witnessed this apparent vascularity, I have entirely satisfied myself that the vessels were those of the organ, and not of the morbid product. In the lung, matters appear to me to be in a similar condition. Supposing a portion of lung to be infiltrated, as it were, with tuberculous matter, instead of having it deposited in nodules, injected matter would then seem to pervade the tuberculous matter, because the proper vessels of the organ are intact, and because the fluid has passed through them. But if the tubercle be a nodule developed in an air cell, the tissue of the organ being pushed aside by it, no injection can be passed into the tubercle. The difference in this respect would depend upon whether the tubercle were developed on the mucous surface of the air vesicle, or in the cellular tissue of the organ.

Injection, then, does not establish any distinctive character between the matter of Scrofula and that of Tubercle.

So far as to the product itself, and the place of its deposit;