CONTROL CASES.

Examinations made in thirty-three cases of fever due to causes other than typhoid did not give reaction. These were cases where there was no history of previous typhoid, but examinations made of patients who had had typhoid two or more years before gave negative results. Besides these a number of control examinations were made of the blood of healthy persons and from bodies in the *post-mortem* room. Such gave negative results, but of these we have not kept an accurate record. Nothing in the control examinations has given us any ground for supposing that the reaction occurs apart from typhoid.

INFLUENCE OF DRYING UPON THE BLOOD.

Samples of blood kept dry in the ordinary air and temperature of the laboratory for sixty days still gave a good prompt reaction. Shorter periods, such as one or two days of drying, did not appear to have a material influence on the reaction. Apparently any injurious effect which may follow from drying is not so much due to the direct effects of desiccation on the specific substance as to the difficulty of obtaining the substance in solution afterwards. This has already been stated by Pfeiffer and Proskauer to be true of dried cholera serum, though no statement is made by them as to dried cholera blood.

REACTION FROM HORSES' BLOOD, ETC.

Jointly with Dr. W. H. Jamieson, one of us (J.) has studied the blood of a number of domestic animals, and can confirm the statement of Bordet, to the effect that the blood of the horse often produced a clumping and granular appearance in typhoid culture which we have not been able to distinguish from the effects of typhoid blood, except by the fact that the horses' blood produced a similar agglutinative effect on the cultures *B. coli*, which typhoid blood does not. There are some therapeutic possibilities for employment of horse serum in *coli* infection which we have not investigated. The only medico-legal application we have made of the reaction resulted in the restoration of harmony in what promised to be an awkward disagreement among medical witnesses in a case thought to be due to poisoning, but which presented post-typhoid lesions, a case which had been treated without any suspicion of typhoid having occurred to the attending physician. Of course under certain circumstances the presence or absence of the reaction might have great forensic importance in the examination of a blood stain.

EXPERIMENTAL PRODUCTION OF THE REACTION IN THE BLOOD OF ANIMALS.

We were relieved to find that it is easier to produce the serum reaction experimentally than one would suppose from the recent accurate experiments designed to produce complete immunisation. We have found that a single intraperitoneal dose of attenuated typhoid culture in the guinea-pig is sufficient to produce a perfect blood reaction without any serious detriment to the animal's health. This accords with the more recent statements of French authors that a complete reaction may exist with very slight immunity.

SERUM REACTION OF DRIED BLOOD IN EXPERIMENTAL CHOLERA.

These experiments were done in the Pathological Laboratory of McGill College with the assistance of Mr. E. W. Hammond. We have found that the dried blood of animals experimentally inoculated with cholera culture gave the reaction typically after several days' drying. This should make the dry method applicable to cholera, in which disease Achard and Bensaude have recently shown that the reaction may be present even as early as the first day.

THE SERUM REACTION AS AN AID IN ISOLATING TYPHOID BACILLI FROM FÆCES, WATER, ETC.

Some preliminary experiments in the direction of straining off the clumped masses of typhoid bacilli obtained by adding typhoid serum to cultures in which when they were present together with the colon bacillus have been made, and have given us encouraging results. How far the power of separating mechanically in an hour or so most of the typhoid bacilli out of a mixed culture with *B. coli* may improve the existing state of our technique we cannot yet say.

We may mention that after adding typhoid serum to culture made from typhoid stools, a peculiar diffuse precipitation, attended by a clearing of the upper part of the fluid, was observed. In this way we are generally able to distinguish, out of a series of broth cultures made a few hours before, those from typhoid and those from normal fæces. A good deal seemed to depend upon the exact composition and reaction of the medium, as with some lots of bouillon we were unable to get this coarse reaction, and we are still unable to give directions whereby it can be obtained with certainty.

While Pfeiffer has undoubted claim to priority as to the description of all the essential features of the reaction, the recognition of its great value as a method of diagnosis and the introduction of a simple and accurate method are due to Widal, who first discovered that it was present early in cases of typhoid. The admirable work of Gruber and Durham, who first correctly interpreted the nature of the reaction, does not appear to have received the recognition which it deserves. For instance, these authors published some months before Widal the simple method of observing the reaction under the microscope with a drop of serum, which has since become the one generally used.

CONCLUSIONS.

1. The use of dry blood serum diagnosis has given us what appeared to be satisfactory results for diagnostic work.
2. An incomplete reaction was occasionally obtained as early as the end of the second day.
3. The complete reaction was rarely delayed beyond the fifth day.
4. Typhoid blood allowed to dry for 60 days still gave the typical reaction. This might permit of its application to medico-legal work.
5. In experimental cholera immunity, a typical reaction was obtained with dried blood.
6. The reaction may appear after a single dose of typhoid or cholera culture.
7. There is a possibility that the clumping of the typhoid bacilli may be utilised as a means of isolating them from cultures made from water fæces, etc.

NOTE.—In order to investigate more thoroughly the nature of doubtful cases of typhoid and of febriculae, the Board of Health of the Province of Quebec now supplies to the public dépôts small sterilised bottles in mailing cases, which bottles contain a sterilised curette. This curette can be used either to obtain a small quantity of fæces, or again to hold fluid blood.

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ON THE CAUSATION OF LEPROSY AND THE EXTENT OF ITS OCCURRENCE IN EUROPE.

[WITH PHOTOGRAPHS.]

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LEPROSY was first brought under my notice quite accidentally four years ago at Akureyri on the north coast of Iceland, where my companion, Dr. Cahnheim of Dresden, and I found some 70 patients awaiting us for advice. More than half this number were eye patients, and amongst them a woman blind in both eyes from some xerotic leucomatous mischief, and a man still able to see well, but with a yellowish subconjunctival growth on the right eye and chalazion-like nodules of the upper lid. I felt at first uncertain how to explain the nature of the episcleral growth until I associated it with the presence of a few warty nodules on the face when I recognised that I had to deal with a case of leprosy. Had I not remembered that I was in a country noted for echinococcus and leprosy, I might not have arrived so quickly at the right diagnosis. Once on the track I soon found the woman to be a sufferer from leprosy too.

I have had opportunities since of studying the clinical side of the disease, both in Iceland in 1895 and in Egypt last winter.

It appears to me as though a vague idea has been reigning in Europe up to quite recently, and in not a few parts continues to do so, that leprosy is for Europe a semitraditional disease, lingering on in a few isolated spots, and certain soon to disappear there. There can, however, be no doubt that to believe this would be to live in a fool's paradise. Leaving out those parts of Europe which are well known foci of leprosy, such as Norway and the Greek Archipelago, a fair sprinkling of cases are sure to be scattered over Europe if only they are looked for. It can hardly be otherwise if we consider the ease and frequency of travelling at the present time. The diagnosis of leprosy sometimes offers considerable difficulties. I do not mean to say that an advanced case of "tubercular" leprosy could be mistaken even by the most inexperienced; but the early stages, especially of the nervous or anæsthetic form, may easily escape detection. The very fact that we are not able to fix the so-called period of incubation nearer than "within three years or thereabouts" speaks for itself. This time of incubation is nothing else than the early stage of the disease, where the symptoms are not sufficiently marked to induce the patient to seek advice. This is due very much to the indolence of the patient, as in other diseases; but the want of experience on the part of the practitioner is not without responsibility. I will instance an analogy in support of this assertion.

From time immemorial it has been accepted that tuberculosis does not exist in Iceland. In 1889, 1892, and 1895, Dr. Cahnheim and myself found all kinds of tuberculous affections, acute pulmonary tuberculosis, phthisis, tuberculosis of the joints—everything except lupus. A couple of years ago a young practitioner, well equipped and willing to observe carefully, began to look out for tuberculosis. At the beginning of last year he was able to publish¹ 34 cases of pulmonary tuberculosis, in all of which the microscope showed the presence of the bacillus of Koch, and 9 cases of tuberculosis of the bones and joints. But such is the *vis inertiae* of old traditions that even some medical men deduce therefrom, in all seriousness, the conclusion that tuberculosis must have been introduced recently, and is now spreading rapidly, instead of the more obvious conclusion that the diagnostic acumen has increased on the island.

It is therefore not surprising that the official statistics which gave the numbers of lepers in Iceland in 1886 as 47, and which were adduced as evidence to show that leprosy is rapidly dying out in that country, have proved to be totally wrong. The inquiries which Dr. Ehlers made in 1894, and in 1895, have brought to light 158 cases, of which a complete history was taken, together with various photographs. It is quite certain that many cases exist which are not included in this number, and in fact statistics thus obtained must necessarily be below the actual number. It is the same with the inquiry made by Dr. Engel Bey in Egypt a few years ago. In 1882 the Conseil de Santé instituted a count, which was confessedly incomplete, and gave 1,018 cases of leprosy. Eight years later Dr. Engel received official information of the existence of 2,204 cases. He remarks himself² that this number is by no means complete. The 158 cases found in Iceland are thus distributed amongst the two sexes: 91 males, 67 females, or 42 per cent. females—a proportion confirmed by observers elsewhere.

The most important question is at present, What is the etiology of leprosy, how is it spread?

I do not think there are many leprologists at the present day who consider leprosy as other than a microbic disease. The discovery of the bacillus lepræ by Armauer Hansen in 1874 has gradually led most of us to regard leprosy in very much the same light as tuberculosis, namely, as a disease produced by a specific bacillus. There are some—and amongst them men of great sincerity—who still cling to the idea of its being due to the influence of some peculiar kind of food, especially fish. Fish is consumed, especially in littorals, and it is in parts of the world forming littorals

that we find the most fertile foci of leprosy. But this is easily explained by the considerations that these very parts are seaports, once on the highway of the world's traffic.

Then, again, if fish diet were the cause of leprosy, why is it that, after all, only a small proportion of the population is attacked by the disease in a country such as Iceland, where fish forms the staple diet of the whole population?

The causes of the spread of the disease can be more easily understood when we look at the hygienic conditions. No one who knows anything of the high intellectual and literary culture of the Icelanders would have thought them capable of the complete absence of anything like sanitary arrangements, even of the most elementary kind. The farms all built after one pattern, are formed out of four or five square rooms, placed close together in a row facing the "road;" the walls are made of turf laid on lava blocks, the roof is likewise of turf, and covered with grassy sods. The interior of the rooms is lined with wooden planks, and so are the front gables. The entrance is situated in the middle of the front, and opens into a dark passage which runs at right angles, and leads into various rooms. The kitchen has some light from a hole in the roof, intended as an outlet for the smoke. The ordinary living room in which the whole family and the farm hands live by day and night, has a series of large sleeping berths round the walls, broad and covered with huge eiderdown beds and often artistically worked tapestry. Two or three people sleep in one berth, and the room often contains fifteen to twenty people. The turf walls and roof soak up the rain-water like a sponge, and when the people come home out of the rain their wet clothes do not dry for a long time. The air in the house then becomes quite unbearable; the little windows are fast and cannot be opened, and when the smoke comes in from the kitchen (the fuel is usually sheep's dung, as neither wood nor coal occurs) the stench reaches an intensity which we could hardly endure. The beds are shared by domestic animals, with whom the children "exchange caresses and echinococci," as Dr. Ehlers graphically expresses it. The food is insufficient, medical help in cases of illness difficult to obtain; no wonder, then, that the soil is fertile for any infectious diseases, in fact for diseases of any kind. The wonder is that there are so many people apparently healthy enough, though often a poor complexion and prematurely aged appearance bear testimony to the unhealthy conditions under which they live.

The further question in the etiology of leprosy hotly discussed of late is whether the spread of the disease is due to heredity or infection.

In this respect Iceland is probably the most suitable country to look for a satisfactory answer. Colonised in 874 from Norway by Norwegian nobles, many of the Icelanders of the present day have kept their family record carefully, and not a few trace back their ancestry without a break for a thousand years. It was therefore possible in almost every case that came under our notice to ascertain the family history, and quite recently Dr. Ehlers has published a detailed analysis of these cases with regard to consanguinity.³ It appears from this that heredity can almost be excluded, and that in every instance infection by contact is highly probable. This is all the more likely as a most astonishing indifference seems to reign towards this terrible danger. Although scarcely credible, instances like the following are nevertheless true. I give them in Dr. Ehlers's words, which unveil a ghastly picture. They both refer to last year's visit.

I was sitting in a house in Svarfardalur, and was examining a woman with discharging leprosy ulcers all over the face, on the lips, and in the throat, when suddenly a healthy woman entered for the purpose of consulting me for hysterical symptoms. According to the custom of the country she kissed all those present except the minister and me; the leprosy woman received a hearty kiss on the awful mouth.

Here is another example:

An unmarried woman who lives at parish expense on a farm in the Eyjafjörður district had in the winter of 1894-95 a child from a healthy man living on the same farm. She has been a leper for nine years, and her face is described in the notes taken the year before (1894) as follows: "The skin on the face everywhere thickened, brown-violet, with isolated

¹ G. Magnússon, *Hospitalstidende*, 1895, No. 18.

² Franz Engel Pey, Bericht über eine Leprosie-Erkrankung in Ägypten, *Monatshefte f. prakt. Dermat.*, xvi, 1, June 1st, 1895.

³ E. Ehlers, Ätiologische Studien über Lepra, besonders in Island, *Dermatol. Zeitschr.*, iii, June, 1896, Heft. 3, p. 276.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

fresh nodules and great ulcerations on the cheeks and ears. The tip of the nose had been eaten away by ulceration; the nose is saddle-shaped, and blocked with scabby ulcerations. The left eye is nearly blind with milky white corneal opacities. Eyebrows and cilia absent. The voice is hoarse and toneless. Ulcerating lepromata on tongue, hard and soft palate.

When the genealogical tables speak against heredity, and we are enabled to observe facts like these with our own eyes, are we not compelled to attribute the spread of leprosy almost exclusively to infection? I say almost, because the possibility of heredity need not be denied altogether. It could be accepted as certain if it were demonstrated without a shadow of doubt that the specific bacillus occurs not only in the placenta, but also in the foetus.

On the other hand, it must be confessed that the contagiousness of leprosy has not been proved with mathematical precision. If, on the one hand, the experiment of Dr. Arning, who inoculated the convict Keano, has been alleged as a proof positive for the contagionists, it must not be forgotten that the value of this example was shaken when it was found that leprosy had existed in the convict's family, from whom he might have acquired it before the inoculation by Dr. Arning took place. But even then it remains noteworthy that a leproma developed at the very spot of the inoculation.

When I met Professor Koch in Cairo last winter we discussed another possibility for the spread of leprosy. It is conceivable that the human body is only the accidental host of the parasite whose ordinary *habitat* is extrahuman. Examples of this we know—for example, the tetanus bacillus. The question is not a simple one. On the one hand, we should expect a more frequent infection if the virus were thriving in some extrahuman medium; on the other hand, we must not lose sight of the fact that the bacillus requires a combination of favourable accessory conditions. Were this not so, and the virus was easily carried over from one individual to another, as in the case of syphilis, leprosy would certainly be much more widely spread than it happily is. It is markedly a disease of the poor, while syphilis has its victims in all classes of the community. We have no evidence whatever to show in favour of the extrahuman existence of the bacillus lepræ, and until we have we cannot take this hypothesis into serious consideration.

In bringing this question forward my object is to attract attention to the disease. I must say I disagree with Professor von Bergmann when he says "the affection can be diagnosed at the first glance." To diagnose an advanced tubercular case is simple enough—in fact, nobody could possibly make any mistake there; but the early cases, and also some advanced cases of the nervous form, may present difficulties even to an experienced observer.

A few days ago an old patient of mine whom I had not seen for eight years came to consult me again about her eyes. When she lifted her thick veil I was fairly startled. I beheld a face that I might have easily mistaken for tubercular leprosy in an advanced stage. As it was, some seven years ago she had started lupus, and now the disease had made such progress that if I had met her in Iceland or in the Levant, my first impression would probably have been leprosy.

The accompanying illustrations, chosen from a large number of photographs which I have taken, comprise the anæsthetic, the mixed, and the nodular form, for which latter the name of "tubercular," as admitted into the English terminology, should be replaced by the word "tubercous." If tubercular means anything at all, it has reference to the "little" knolls produced in the skin. But when these little knolls become as large as potatoes, as "tubers" proper, we may use the term "tubercous" with better right than "tubercular."

Leprosy is certainly not on the decrease in Europe, except solely, perhaps, in Norway, where, within a comparatively short time, the number of recognised lepers has been reduced from 3,000 to 800, owing to isolation and other similar measures.

In the Greek Archipelago it is of frequent occurrence, the Island of Crete containing by itself some 900 lepers.

In France leprosy is not unknown. Paris alone harbours more than 150 lepers. The disease seems on the increase in the South and the Alpes Maritimes. In Brittany it is of old standing, though its continuance there may possibly be accounted for by the circumstance that every summer about

3,000 French fishermen, mostly from Brittany, visit Icelandic waters in pursuit of their occupation, and spend part of their time in Reykjavik.

In some parts of Central and Northern Italy the disease seems to exist mostly unrecognised, but sufficiently reliable dates are not before us. Considering, however, that every year a large number of Italian labourers go to the North and South American Continents for the season, and return after some months, it is not difficult to see how easy the access of infection has been rendered by this oscillating stream.

In Russia leprosy is no rare occurrence, and the littoral of the Baltic in particular shows some foci of great activity. Within the last fifteen years the district of Memel in Eastern Prussia, close to the Russian frontier, has been found infested to a considerable extent, and leprosy is gaining ground there.

Of great interest is a case which Professor Lassar demonstrated at the Berlin Medical Society in November, 1895, a young married woman suffering from leprosy for some time. Married five years ago, she is the mother of two healthy children. A year before her marriage she noticed the first manifestations of leprosy. She resides in Cork, and had come to Berlin to consult Dr. Lassar. It was a case of mixed leprosy, the tubercous form prevailing. The etiology of the disease was cleared up when it was ascertained that the patient had been born in Esthonia, and lived there until nine years ago. Dr. Lassar, whom I saw here after the meeting of the Dermatological Congress in London, told me that she was then in London, and that he had looked her up on that occasion.

DESCRIPTION OF PHOTOGRAPHS.

Fig. 1.—Advanced stage of tubercous leprosy, showing the typical *facies leonina*. The eyebrows have gone, though the skull remains well covered with hair. The nose has exactly the same appearance as in the well-known portrait of Father Damien, the tip of the nose, the right ala nasi, the upper lip, and both naso-labial folds show the ulcerating stage.

Fig. 2.—Moderate stage of tubercous leprosy. Nodules on face and hands, also subconjunctival leproma on the outer side of the right eye.

Fig. 3.—Advanced case of mixed leprosy, showing the "healing" of the tubercous form. The skin of the face has the glossy cracked appearance of cicatricial skin. Tip of nose, lips, and chin in the ulcerating stage; both eyes completely destroyed; no hair on the skin of the face.

Fig. 4.—Case of anæsthetic leprosy. The disease has seized both the sensory and motor nerves. The illustration shows the right leg of the patient, who was lying face downwards on his bed, unable to use his muscles. In the popliteal region a typical Danielsen's spot, the cicatricial centre white, the surrounding area peculiarly discoloured (yellowish-brown).

Fig. 5.—Mutilating leprosy; an advanced stage of the anæsthetic form. Of the left hand all fingers are missing; on the right only the fourth and fifth are complete.

Fig. 6.—A case of moderately advanced tubercous leprosy. Nodules on lips, cheeks, nose, forehead, and on the skin of the eyelids. The eyebrows are well preserved, a nodule of cherrystone size below the outer part of the upper orbital margin; a similar nodule on the outer part of the right upper lid. The eyes themselves are both affected.

Fig. 7.—A case of "nervous" leprosy. The motor nerves are very much affected, as seen by the marked atrophy of the muscles of the legs, while the affection of the sensory nerves is indicated by the ulceration of the toes and the panaritium-like state of the fingers.

Fig. 8.—This shows the same patient as Fig. 2, taken three years later. The advance in the facial nodules is very noticeable.

Figs. 1, 2, 3, 4, 6, 8 are from the Icelandic collection. Figs. 5 and 7 from the Egyptian collection of the author.

Hitherto the treatment of leprosy has not been encouraging. Sometimes nodules heal without any treatment, but this is not a real recovery; the disease continues, or in the most favourable cases becomes dormant for some time. That such may happen when medical treatment is applied no one will doubt; but the retrogressive change takes place quite independently of the medication. It is probably in this way that we must account for the alleged cures of leprosy by various methods, such as chaulmoogra, injections of sublimate, euophen, inoculation of erysipelas or tuberculin, the use of the actual cautery, etc. Until a successful remedy is found—and we need not despair in this direction—our main duty must be to isolate the infected cases as much as possible. What kind of isolation and how it may best be accomplished will require a most careful and individualising

consideration; and I may say at once that an unconditional compulsion might become too cruel to be carried out. We must not forget that the sufferers from a disease up to the present incurable have every claim to be pitied and cheered. What we can do, however, without any restriction is to spread the knowledge and the fear of this scourge and its infectiousness amongst the people of the parts of the globe wherever it does occur. For Iceland we can gladly say we may hope to see some success from the exertions we have made. The inhabitants are scattered about the coast line in some 4,000 houses. On our return home last year a popular treatise on leprosy, written by Dr. Ehlers and translated into Icelandic, was sent to every household on the island, where it is sure to be read and its illustrations carefully studied during the long winter evenings.

The suggestion of instituting a special hospital in Iceland where lepers could find an asylum was not entertained last year by the local Parliament for want of funds, as far as I understood, and the proceeds of various lectures which we gave for the purpose were only very small when compared with the outlay for even the most primitive asylum. But this year, an Icelandic priest having collected a large sum of money on the Continent, principally in France, I learned to my great satisfaction that it has been decided to erect a leper hospital with sixty beds in Reykjavik.

OBSERVATIONS UPON THE RELATION BETWEEN LEUKÆMIA AND PSEUDO-LEUKÆMIA.

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THERE are few chapters in the domain of clinical medicine which have excited the interest of modern observers more than the diagnostic value of a blood examination. That it is an undoubted aid in the diagnosis of many diseases cannot but be acknowledged by all who have had any experience with these methods. But although they have been so extensively employed within recent years, there can be no question that hitherto the results have not fulfilled our expectations. In the light of the most recent observations it may be said with more than probability that there is no disease known other than those due to parasites which, *per se*, can be diagnosed by an examination of the blood. Although a certain general law may apply to the conditions of the blood found in the various forms of anæmia, for example, such a law nevertheless is far from being absolute. Many of the secondary anæmias not infrequently show a blood condition which is indistinguishable from that of the progressive pernicious anæmia; and, apart from other clinical observations, it is absolutely impossible to make a satisfactory diagnosis. We have time and again observed in patients who were apparently suffering only from grave chlorosis, an enumeration of blood cells corresponding to that usually found in pernicious anæmia; and the same may be said of not a few instances where tuberculosis and malignant disease have afforded similar observations. During the past year, also, in a patient suffering from anorexia nervosa, the blood examination revealed 900,000 red cells, about 20 per cent. of hæmoglobin, nucleated red cells of various sizes, and otherwise a condition which, from the stained specimen, showed all the characteristic features of the blood of pernicious anæmia.

From the work, too, that has been published in the last few years the diagnosis of such a disease even as leukæmia cannot be established from a mere examination of the blood constituents. As has been shown by a number of recent observers, sarcomatous growths may undoubtedly induce a cellular ratio in the blood which is indistinguishable from that present in a typical true leukæmia. And hence, from our present knowledge, it would seem practically impossible to diagnosticate definitely a leukæmic condition, apart from the numerous concomitant symptoms, of objective and subjective.

Having ourselves met in the past few years with not a few

cases where an absolute diagnosis of leukæmia or of pseudo-leukæmia was rendered extremely difficult, it has seemed to us worth while to note this fact, and to mention briefly some instances which show how closely related these two conditions really are. That the relation between the two is in itself nothing new we are quite aware, but inasmuch as the matter has only been referred to in connection with isolated cases, and inasmuch, too, as the subject has apparently received far less attention than it deserves, we have taken upon ourselves to emphasise it the more.

Previous to careful and systematic examination of the blood the French writers, under the term "adénie," or "diathèse lymphogène," grouped together all those diseases which appeared to involve mainly multiple lymphatic glandular structures; hence they included leukæmia and pseudo-leukæmia under the same head. And it was not until some years later that an examination of the blood revealed occasional differences which permitted of a subdivision into various forms of lymphogenous diathesis and of a separation of the two diseases above mentioned. Since that time it has been the practice of physicians to describe under different headings these two closely allied diseases, and yet within the past few years case after case has been recorded to show that such a separation is scarcely justifiable.

If we compare, for example, the morbid anatomy of the two affections, we observe to all intents and purposes identical conditions; we may get in both the same lymphoid overgrowths in the organs and in the tissues, not only where lymphoid elements previously existed, but elsewhere as well, and, above all, in the bone marrow. Within the last year, however, Askanazy¹ writing in *Virchow's Archiv*, and following the views of Neumann,² who regarded leukæmia as a disease primarily of the bone marrow, has asserted that the morbid anatomy of the two diseases has one great distinctive feature; that in leukæmia the marrow throughout is diffusely affected, while in pseudo-leukæmia the changes are always localised, manifesting perhaps multiple lymphomata, but never a diffuse lymphoid or pyoid condition. From the number of cases on record, however, proving the contrary the distinction would scarcely seem justifiable; while Askanazy's explanation of the absence of bone-marrow changes in some cases of true leukæmia are scarcely forcible enough to render the theory unimpeachable or to convince other authorities on this subject.

Nor can one distinguish between the forms of multiple glandular enlargements or the varieties of splenic tumours, the macroscopic and microscopic lesions are throughout interchangeable; in both one may have a like tendency to infiltration of cells; and in both the true and the so-called false disease metastases may occur in almost any part of the body. Recent observations have in this respect borne out the older theories of those who recognised between the two conditions no distinctive morbid anatomy.

There is no more satisfactory proof necessary to bear out the theory of this close relationship than is obtained in a casual perusal of the literature of the past decade, dealing with some cases of leukæmia, for it sufficiently illustrates the many difficulties one meets with in endeavouring to differentiate between cases of true leukæmia and of Hodgkin's disease. Almost every year within that period one or more cases are recorded, showing with what hesitation the observer is inclined to make any absolute distinction. If distinction there be, it is universally recognised to be a clinical consideration only, for from the morbid anatomy alone we can obtain no satisfactory differentiation other than the presence of increased leucocytes within the blood vessels. Even this, from the point of view of pathological diagnosis, is not free from objection, inasmuch as we may be at a loss to decide whether or not such a condition has been a terminal process, as so commonly occurs. The leucocytosis itself is a purely clinical observation, and it is mainly upon this feature that any question of differential diagnosis rests.

Concerning the clinical picture of the two maladies, we find in each an identical classification into types; in both a chronic form is described and in both a more acute, characterised often by the presence of irregular fever, early enlargement of glands, and onset of hæmorrhages and a rapidly progressive lethal termination. Such is Ebstein's³ case of acute Hodgkin's disease, in which, except for the condition