SOME HÆMATOLOGICAL NOTES.

By GEOFFREY HADFIELD,

Pathologist to the Royal Free Hospital.

ALTHOUGH modern hæmatology is one of the more progressive branches of general biology, it is undoubtedly overburdened by a terminology so unwieldy and controversial that the advanced hæmatologist in conversation with the general physician runs the risk of failing to make himself understood, and hæmatological literature is slowly becoming a closed book to those who have neither the time nor the enthusiasm to acquaint themselves with the current theories and nomenclature concerning the embryology of the blood-forming tissues. It seems that we are in a transition period, and that until the hæmatological giants decide to speak our language we must allow them to confuse us by calling every embryological blood-cell by three names. The literature of the subject is, however, crammed with research which should be made more accessible for the diagnosis and prognosis of disease could it be shorn of its more confusing technicalities.

In this article an attempt will be made to emphasize some of the simpler modern conceptions of the so-called leukæmias, and to indicate the clinical significance of the appearance in the blood of certain primitive cells, whose ancestry is still debatable from a purely biological point of view, but whose presence in a blood-film is frequently of great assistance in diagnosis and treatment.

The phrase, "leukæmia, a disease of the blood," contains two inaccuracies. First, it supposes that in this group of diseases there is always a permanent increase in the total number of leucocytes in the circulating blood, a misconception which gives rise to the fallacy that if the blood leucocytes fall in numbers the disease is improving, and that if they fall to within normal limits the disease ceases to exist. Second, these con-

ditions are, without doubt, due to a pathological change in the blood-forming tissues which is merely reflected in a secondary fashion in the blood, so that if we substitute for "leukæmia, a disease of the blood," the phrase, "the leucoses, a group of diseases of the blood-forming organs," we rob the subject at the outset of two common misconceptions.

As regards the numbers of circulating leucocytes in the leucoses, although the classical case in which the disease exists in a chronic form frequently carries a quarter to half a million white cells per cubic millimetre, this number, during the natural course of any individual case, often falls, sometimes to within normal limits, and a marked quantitative fall can be artificially induced by the vigorous application of X-rays to the bone-marrow and spleen, by the use of radium, and by the administration of arseno-benzol compounds which, in sufficiently large doses, are powerful bone-marrow poisons. It is well established that the majority of the chronic leucoses which die of the disease and not from some vascular accident, relapse into a state in which the total leucocyte count is low and often numerically within normal limits. When leucosis is acute from the onset, the quantitative increase in the numbers of blood leucocytes is relatively slight, and in the more acute forms not infrequently lies within normal limits. It is usual, therefore, to say that all chronic leucoses tend to terminate in a state of acute leucosis, in which mere enumeration of the blood leucocytes may be frankly misleading. Thus, the quantitative examination of the white cells sometimes introduces error, and is never so useful as an examination which makes the morphology and staining reactions of its cells the object of primary importance.

A case of leucosis with a low total white count has usually a much more atypical blood and therefore a more seriously diseased set of hæmatopoietic tissues than one in which the numbers are forty times the normal. In

those bloods in which the disease is chronic, the count high and the patient relatively comfortable, one finds that adult leucocytes with their mother cells make up the bulk of the increase. As the count falls the cells develop an increasingly immature complexion. The fall chiefly affects the adult fully-differentiated sterile cells, more and more of the mother cells (myelocytes) enter the blood, and are later accompanied by cells so far back in the ancestry of the hæmal leucocyte that they bear no distinguishing mark or characteristic by which one can easily relate them with any cell found in normal blood. It is around these cells that the battles in the hæmatological world are waged most fiercely, but whatever their embryological relations may be, there is no doubt that in the majority of cases their progressive increase in numbers, even with a numerically normal blood-count, is of serious prognostic significance. These cells are usually the parent cells of the granular myelocytes of the bone-marrow. Superficially they closely resemble the large mononuclear leucocyte of normal blood, are devoid of stainable granules, and do not possess to any degree the hall mark which distinguishes cells of bone-marrow origin, namely, a cytoplasmic oxydase capable of being demonstrated by the indo-phenol reaction. Their superficial resemblance to lymphocytes, and the fact that so many cases of chronic leucosis have an acute termination in which these cells outnumber all other forms of leucocyte, gave rise to the erroneous impression that cases of "chronic myeloid leukæmia," leucosis of the myeloid type, could terminate as "acute lymphatic leukæmia," leucosis of the lymphatic type.

Now acute leucosis of the lymphatic type is a very rare disease, much less common than acute myeloid leucosis, and an acute termination is frequent in the relatively common chronic myelosis, so that whenever these primitive cells are encountered in large numbers in blood-films, it is likely that they are the parent cells of myelocytes and

are properly called myeloblasts. A high percentage of myeloblasts therefore indicates a case of chronic myelosis approaching the end, or one in which the count has been modified by treatment or myelosis in a dangerously acute form.

To summarize, one may state that:—

(1) A total leucocyte count falling within the limits of normal may be found in the "leukæmias" (leucoses).

(2) If occurring spontaneously, it is usually of serious import.

(3) Accompanying the fall there is usually a gross increase in the percentage of large, relatively simple cells resembling the large mononuclear leucocyte of normal blood.

(4) In the large majority of cases these cells are myeloblasts.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

(UNIVERSITY OF LONDON.)

At the Annual Meeting of the Court of Governors of the London School of Hygiene and Tropical Medicine, held on November 30, in the Council Room of the British Medical Association's house in Tavistock Square, the Board of Management of the School presented their Fourth Annual Report. Sir Holburt Waring was in the chair. The Board state that substantial progress has been made towards the completion of the organization of the School, of the building, and of its equipment.

The work of the old School of Tropical Medicine, which was taken over in 1924, continues to make most satisfactory progress, and the Director reports that there is an increase of no less than 17 per cent. in the proportion of students sitting for the Diploma in Tropical Medicine and Hygiene who were successful.