are three points of interest, the extreme bloodlessness of the organs and the small quantity of blood in the heart and vessels, the advanced fatty degeneration of the heart and other organs, and the condition of the bone marrow.

[In certain cases, having a close resemblance to pernicious anæmia, Dr. Fenwick, of the London Hospital, has described an atrophy of the gland structures of the stomach; but what connection that has with the anæmia—whether as cause or effect—appears doubtful. In future, the stomach should be carefully examined in these cases.]

The bloodlessness of the organs is extreme, and the heart and arteries almost empty; in one instance I could collect only ʒij of blood from the chambers of the heart and the aorta. The fatty degeneration is secondary to the anæmia, and is a very constant change. Formerly, cases of this disease were described by some writers as, "idiopathic fatty degeneration." The alteration in the bone marrow has attracted considerable attention, and is believed by certain pathologists to have an important connection with the disease. The long bones have been found to contain a rich red marrow, which has replaced the normal fatty tissue of the medullary canals of bones of adults. This consists of granular marrow cells, small lymphoid corpuscles, myeloplaques, red blood corpuscles, and large nucleated red corpuscles. The latter have been spoken of by many writers as if they were not a usual constitutent of adult marrow; according to my observations they can always be found in the *red marrow* of the ribs and short bones, often in considerable number. [I am surprised that so good an observer as Prof. Rutherford, of Edinburgh, should state, in the little work on Practical Histology, which many of you use, that he has never been able to see these bodies in the marrow.]

This change in the medulla of the bones, in pernicious anæmia, was first studied by Pepper, Cohnheim and myself, and we were inclined to attribute to it a somewhat important rôle in the pathology of the disease. The position which I took in the matter may be gathered from the following remarks in a paper before the Canada Medical Association in 1877:

"Clinically, these cases present certain similarities to those of leukæmia and Hodgkin's disease, or pseudo-leukæmia. Now these latter diseases differ chiefly in this, viz., that in leukæmia the colourless blood corpuscles are in excess; in pseudo-leukæmia they are not. Both present three varieties: 1st, the splenic, in which the chief lesion is the great enlargement of the spleen; 2nd, the lymphatic, in which the lymph glands throughout the body are mainly affected; and 3rd, the researches of Neumann, Mosler, and others have made us acquainted with a variety known as the myelogenous or medullary, in which the marrow of the bones is the seat of disease. This tissue is now generally regarded as sharing, in the young animal at any rate, with the spleen and lymph glands, in the formation of blood corpuscles. In the long bones of the adult it is in a state of atrophy, and its place, in great part, supplied by fat. In many cases of leukæmia and pseudo-leukæmia, it increases, becomes more vascular, its cellular elements multiply, nucleated red blood corpuscles, such as occur in the embryo, are formed, and the whole tissue passes into a condition of hyperplasia, strictly analogous to that affecting the spleen and lymphatic glands. This may be, as in a case recently reported by Mosler, the primary lesion in leukæmia, and the development of the marrow may produce definite symptoms, such as swelling and tenderness of certain parts of the bones; so that the myelogenous forms of these affections are now well recognized. Clinically, the myelogenous form of pseudo-leukæmia, though rarely uncomplicated, presents such a similarity to pernicious anæmia that Jaccoud and Immerman suggested the identity of the two affections, while Prof. Pepper, declared distinctly that pernicious anæmia was 'merely the simple medullary form of pseudo-leukæmia.'

"In the present state of our knowledge it may, I think, be reasonably affirmed that certain cases of idiopathic anæmia may be placed in the category of myelogenous affections. To many it may appear far-fetched to seek, in the altered condition of the bone marrow, an explanation of the extreme anæmia of this disease, but the reports of numerous cases