SOME CRYSTALLINE CONSTITUENTS OF THE NON-SAPONIFIABLE FRACTION OF BONE MARROW

WE were interested in the isolation of pure substances from yellow bone marrow in the hope that we might find one or more especially effective in the formation, maturing and release of white blood cells, especially the granulocytes. Others have reported that it is the non-saponifiable fraction of bone marrow fat which is effective in the treatment of agranulocytosis. Consequently, we centered our efforts on this fraction, amounting to a few tenths of one per cent. of the entire marrow.

Since the greater part of the marrow in the large bones of beef is fat, we first had this fat extracted by suitable solvents and then saponified it, extracting the valuable non-saponifiable portion from the soap. Our second method called for direct saponification of the entire marrow, a process that probably broke down certain protein structures in the aqueous fraction of the marrow with release of more fat or lipid than is possible with solvents alone. There are advantages in both methods.

By careful fractional crystallization of the non-saponifiable fraction from suitable solvents we isolated four crystalline substances of high purity and a few others which, if not quite pure, are mixtures of closely related compounds not readily separated by solvent fractionation. All these substances were obtained by the second method mentioned above, that is, saponification of the entire bone marrow. Of course, the proteins and water solubles of the aqueous-type fraction were eliminated by the solvents used in extraction.

In addition to the four colorless crystalline products reported below we secured a number of highly colored oily or semi-solid fractions set aside for further study. The four listed below contained oxygen and were carbinols.

CRYSTALLINE PRODUCTS

(1) Carbon 73.6 per cent., hydrogen 13.4 per cent.; melting point 66°–67° C. The benzoate melted at 35°–36° and the acetate at 34°–35°. Molecular weight by Rieche micro method (usually found 5–10 per cent. low on known pure substances) was 296.

(2) Carbon 83.8 per cent., hydrogen 12.2 per cent.; melting point 147°. Benzoate melted at 144°–144.5°, acetate at 113.5°–114°. The sterol recovered by saponification of the benzoate melted at 147°. Gave good Liebermann-Burchard test for sterols. Mixed melting point test with cholesterol confirmed identity of this substance with cholesterol.

(3) Carbon 76.9 per cent., hydrogen 13.0 per cent.; melting point 61°–63°. The benzoate melted at 137°–138° with preliminary softening and the acetate at 37°–38°. Molecular weight by Rieche method, 268.

(4) Carbon 82.2 per cent., hydrogen 12.1 per cent., for substance contaminated with cholesterol. Melting point after removal of cholesterol was 124°, not sharp. The benzoate of the purified substance melted at 123°–125°. A sterol, forming a digitonide.

This report is wholly preliminary. Further separations and purifications of marrow substances, in addition to biological testing, are in process and will be reported later in greater detail.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

LATEX EMULSIONS IN HUMAN VASCULAR PREPARATIONS

FOR generations vessels and ducts have been filled with materials to make them stand out in anatomic preparations. Many different substances and combinations have been used. The older anatomists introduced many masses which are still useful. For example, in Paris one sees the preparateur injecting melted tallow colored with vermilion. In this country in human anatomy the use of a starch paste prepared by mixing lump starch and color, either red lead or a red lead substitute, with cold water is a common practice. Teichmann's mass was preferred for many years and is still used occasionally. This mass is essentially a heavy oil paint. The late Professor C. R. Bardeen, at the University of Wisconsin, used a shellac which was colored with Prussian blue pigment, in the arteries of human cadavera. This violation of the classic color for arteries resulted in giving the students an opportunity to see small arterioles in beautiful contrast to the surrounding reddish tissues. For many years I have used, both here and formerly at the University of Cincinnati, a variation of this mass, a material prepared for the electrical industry. This material (Ajax —insulating varnish, black air drying No. 26, Sherwin-Williams) I demonstrated at the meetings of the American Association of Anatomists at Cleveland. It has been equally as satisfactory as the mass that I learned to use in Dr. Bardeen's laboratories. It has the advantage of being ready prepared and cheap.

For corrosion preparations the completely satisfactory mass has not yet been found. Substances satisfactory for smaller structures are unsatisfactory for