a strong equatorial point at 71 Å and a ring with equatorial accentuation at 43 Å; a faint equatorial point occurs also at approximately 140 Å. Apparently drying causes a separation of lipoid components, one remaining oriented while another becomes somewhat disoriented. Another indication of the tendency of drying to separate the lipoid components of the myelin sheath is observed in the meridianally sickled 4.7 Å ring of medullated nerve. Upon drying the nerve this ring becomes resolved into a number of rings, of which the most prominent are those at 4.2, 4.7, 5.2 and 5.9 Å. These spacings are found also in dried lipoids extracted from cow spinal cord. The 4.2 and 4.7 Å rings are typical of dried lecithin, those at 5.2 and 5.9 Å of cholesterol. Moreover, such a separation of mixed lipoid crystals upon drying has been shown to occur in artificial mixtures of lipoids. The patterns obtained from such mixtures show considerable variability, depending upon the degree of hydration and the relative proportions of the individual constituents.

Although it was previously demonstrated[3] that the 15.5 Å equatorial sickles of fresh nerve are not due to connective tissue, as claimed by Boehm,[4] the present work shows that this spacing can be duplicated by wet nerve lipoids and is, therefore, interpreted best as a higher order reflection from the extremely well-oriented lipoids in the myelin sheath. This interpretation is strengthened by the fact that with drying this spacing fades out both in medullated nerve and in nerve lipoids.

The well-known tendency of lipoids to combine tenaciously with proteins,[5] their frequent association in living cells, and the wealth of diffraction spacings given by lipoids, as illustrated above, all indicate the necessity of distinguishing carefully between the lipoids and proteins in diffraction pictures of biological materials.

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[3] SCIENCE, 80: 567, 1934.

[4] G. Boehm, *Koll. Zeitschr.*, 62: 22, 1933.

[5] See, for example, S. P. L. Sørensen, *Koll. Zeitschr.*, 53: 102, 170, 360, 1930.

# SCIENTIFIC APPARATUS AND LABORATORY METHODS

## METHOD FOR STUDY OF CRYSTALS FOUND IN AMOEBA BY MEANS OF X-RAYS

THE following method seems to present a very interesting way for finding out the nature of the crystals which are present in some of the vacuoles in Amoeba.

The crystals were prepared for the x-ray picture by putting a few Amoebae which had been carefully washed in several changes of redistilled water on a thin collodion membrane which was stretched over a small round hole which had been drilled in one end of an ordinary glass slide. After the amoeba had settled to the bottom, the excess water was drained off with filter paper, and the amoebae fixed with absolute alcohol. Another thin layer of collodion was added to cover these.

The x-rays were directed on one of these amoebae and then enlarged by means of a pinhole camera. The important features of the photograph obtained are presented in the diagram. On the photograph three or four faint Laue spots are present and the three most distinct ones are represented in the diagram by the spots A, B and C. These seem to indicate that there are one or more definite crystals present which can be investigated further by this method, but are insufficient for identification purposes. The faint outer circle surrounding the central part is probably due to the presence of the collodion membranes used to support the crystals. These investigations are now being continued and preparations of millions of crystals used instead of a few crystals. In this way it is hoped that we will get a series of diffraction spots and thus enable us to identify the crystals if they are like any that are already known.

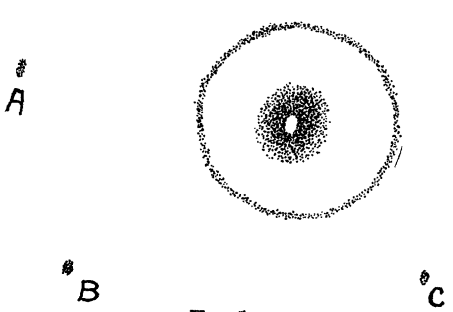


FIG. 1.

The author is greatly indebted to Dr. Maurice Huggins for supervising the taking of the x-ray pictures and explaining the results obtained.

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## VARIABLE TENSION CLAMPS FOR PHYSIOLOGY EXPERIMENTS

THREE marking pens record nicely on the smoked paper, but the fourth drags. The fourth is fixed and