

of lines and in measurements which involve the determination of x-ray energy. Because of the many problems awaiting study in the long wave-length x-ray region, we have adapted the Siegbahn high-vacuum spectrometer for ionization measurements, using the usual single crystal method. The easily attainable resolving power is such as to give observed widths of the $K\alpha$ lines of Cu(29) only a few per cent. wider than when measured by a two-crystal instrument. There seems to be no difficulty in using this instrument to make ionization-chamber measurements up to 5 or 6 Angstroms, or longer.

A test of the "momentum transfer" theory of accommodation coefficients of ions at cathodes: K. T. COMPTON and E. S. LAMAR. In a recent paper, read before the National Academy of Sciences, it was suggested that the accommodation coefficient for positive gas ions on a metal cathode should be less than unity only if the mass of the metal atom exceeds that of the ion. In order to test this hypothesis, experiments already reported for helium ions on molybdenum have been continued for argon ions on molybdenum and on aluminium. The cathode to be studied was the molybdenum or aluminium bob of a glass pendulum, whose deflection gave a measure of the pressure acting, and was immersed in the positive column of a low voltage argon arc. The pressures on the cathode were due to the recoil of those ions which retain some of their kinetic energy after neutralization and to radiometric effects resulting from heating of the cathode by ion bombardment. From an analysis of the data, it was possible to compute an accommodation coefficient for the positive ions. The results indicate an accommodation coefficient of about .79 for argon ions on molybdenum, and an accommodation coefficient of unity on aluminium.

Evidence that acidosis is not caused by acids: YANDELL HENDERSON and LEON A. GREENBERG. In recent years acidosis has been one of the most largely discussed topics in relation to illness. This condition, or group of conditions, is important. But the explanation that is now generally accepted is shown by the investigations to be reported in this communication to be erroneous. It is now supposed that the condition called acidosis arises from an excessive formation of acids in the body. This increased formation of acids is supposed to explain the great decrease of sodium bicarbonate and other alkalies in the blood. The acid chiefly concerned is lactic acid. The amount of this organic acid is increased under severe deficiency of oxygen, as in carbon monoxide poisoning, in which an asphyxial "acidosis" develops. It has recently been shown by Lundsgaard in Denmark that animals which are given a small dose of the drug monoiodoacetic acid are rendered incapable of producing lactic acid. Accordingly, in the investigations to be reported to the academy animals were first treated with this drug, and then subjected to such conditions (deficiency of oxygen) as have been found to induce a state of so-called acidosis. The result was that all the features of that state, particularly the diminution of bicarbonates in the blood, were developed, but without the formation

of any increased amount of lactic acid. The conclusion that the state called "acidosis" is not due to intoxication by excessive formation of acid in the body is in accord with the fact that the administration of alkalies to patients with acidosis, as in diabetes, has not been found beneficial and has been generally abandoned. The theory that "acidosis" is intoxication by acid is an apparently logical deduction from the conception now prevailing as to the nature of the acid base equilibrium of the blood. It is, however, definitely contradicted by facts, and some other theory will have to be developed.

Cellular reactions to lipoids from acid-fast organisms: FLORENCE R. SABIN and KENNETH C. SMITHBURN. The lipoids in acid-fast organisms can be separated into three classes, phosphatides, fatty acids and wax-like materials. The phosphatides are an important factor in the production of the lesions of tuberculosis. They are readily dispersed in water, a property which makes it easy to test their biological reactions. They are phagocytized by monocytes which, in dealing with them, become epithelioid cells. The fatty acids, represented largely in the acetone-soluble material, stimulate all types of connective tissue cells, cause vascular dilatation and hemorrhage and induce adhesions. The wax-like materials have long been considered of great importance because they are responsible for the acid-fastness of the organisms. The wax-like material of the human tubercle bacillus is an alcohol, $C_{66}H_{138}O_4$; the corresponding material from an acid-fast organism isolated from a case of leprosy is a glyceride. These materials can not be wet with water, a property which may account for the fact that the cells deal with them in a manner different from phagocytosis. The purified substances injected in the form of a dry powder cause a multiplication of young connective tissue cells around the particles. These cells are simpler than monocytes and show no signs of being able to phagocytize the wax-like material, but rather they fuse to make foreign body giant cells to surround it. There are then signs of a change in the material which, at first opaque and granular, becomes globular and translucent. If the phosphatide has not been completely removed from the material injected, the monocytes are able to separate it from the wax. These cells then show signs of phagocytosis and become epithelioid cells. Since a single lipoidal substance gives only one type of cellular reaction, the biological tests offer a check on the degree of separation of the lipoids. Although foreign body giant cells occur in tuberculosis, it is probable that they are an accessory phenomenon in the progress of the disease and that the wax-like materials by which they are produced may be classified as biologically inert.

(To be concluded)

BOOKS RECEIVED

- JOCHELSON, WALDEMAR. *History, Ethnology and Anthropology of the Aleut*. Pp. v+91. 27 figures. Carnegie Institution of Washington.
- NEAVE, S. A. and others. *History of the Entomological Society of London, 1833-1933*. Pp. xlv+224. The Society. 10s. 6d.