the solid sulphur trioxide put forward by A. Smits and his co-workers for explaining the vapour pressure anomalies of this remarkable substance[1].

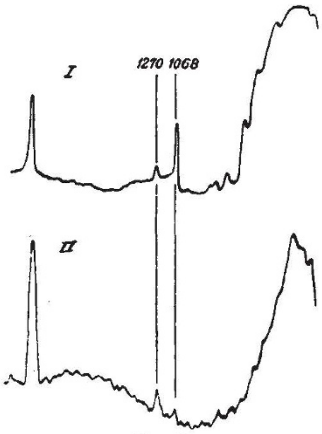

FIG. 2.

We wish to thank Prof. Smits heartily for the interest he took in the work.

H. GERDING.
N. F. MOERMAN.

Laboratory of Inorganic
and Physical Chemistry,
University, Amsterdam.
May 11.

[1] A. Smits, NATURE, 113, 855 (1924); A. Smits and N. F. Moerman, NATURE, 134, 698 (1934).

Deposits of Colloidal Graphite

IN describing the design of an α-particle counter that comprises a leaflet of aluminium attracted to an insulated point conductor, Wassiliew[1] mentions the use of indian ink for fastening a cylindrical conductor to an insulator. Of the conducting contact materials that might be used for this and similar purposes, it is interesting to note that experimenters in the United States have found aqueous colloidal graphite generally useful.

In this instance, a globule of concentrated colloidal graphite in water provides a firm contact accompanied by a decrease in the usual film resistance at the point of application. Such a cement spot not only provides a relatively large area with which to make contact, but also forms a comparatively strong binder for the so-called 'cat's-whisker' type of connexion frequently made for vacuum-condensed substances. It is said[2] that vacua of the order of 10^{-8} mm. mercury can be obtained when several graphite contacts are utilised in one device.

Similar contacts[3] to sample insulating materials for the purpose of determining their volume and surface resistivities, dielectric losses and constants, in no way alter the physical properties of the substances in question or interfere with the treatment of specimens between tests. Commercially, colloidal graphite is used to cement carbon filament ends to lead wires in the base of carbon lamps.

Wassiliew also suggests[1] that leaflets of glass sputtered metallically may be employed rather than foils of aluminium or platinum as cathodes of the counter system. For those wishing to eliminate metallic sputtering in the preparation of such conductive leaves, the same result could be obtained by painting with a camel-hair brush a deposit of graphite on sheets of material like Cellophane, glass leaflets or even paper bases.

On an ebonite surface the resistance of a graphite coating formed from a fairly dilute solution is about 3,000 ohms per cm. square, the same being decreased to 2,000 ohms for a polished surface.

Other applications where colloidal graphite deposits may serve in place of metallic sputtering include the coating of Rochelle crystals in piezoelectric problems, the formation of guard rings for evacuated apparatus, coating of plate glass for electrostatic condensers, and the construction of electrodes in ionisation chambers. Commercially, colloidal graphite films are said to be desirable on the cuprous oxide layers of copper oxide rectifiers and on the oxide layers of aluminium foils used in electrolytic condensers.

BERNARD H. PORTER.

444 Madison Avenue,
New York City, N.Y.
April 23.

[1] S. S. Wassiliew, NATURE, 137, 533 (1936).
[2] C. L. Henshaw, Yale University, 1935.
[3] Church and Daynes, *Rubber Ind. Trans.*, 6, No. 1 (1930).

Origin of the Teleost Scale-Pattern and the Development of the Teleost Scale

ACCORDING to current accounts of scale formation in Teleosts, the scale papillæ originate as independent centres of growth, their constituent cells being derived from the immediately underlying dermis. The remarkable regularity of arrangement of the scales in most fishes has always attracted attention and has led Backman[1] to suggest that each papilla exercises an inhibiting influence on the development of the immediately surrounding tissue.

Recent investigations by me (principally on species of the genus *Salmo*) show that these views are quite incorrect. In *Salmo* the first papillæ arise as aggregations of mesoderm cells along the lateral line, each one immediately beneath a sense organ (neuromast). Each of these primary papillæ soon shows a dorsal and a ventral extension consisting of outgrowing fibroblasts. These outgrowths are inclined obliquely forward, crossing the underlying myotomes and pushing their way between the dermis and epidermis. The other papillæ of the body arise at intervals along these oblique outgrowths and are formed by local multiplication of the fibroblasts. This accounts for the regular sequence of diagonal scale rows which is so characteristic of Teleosts. As regards the spacing of the papillæ along each outgrowth, it may be pointed out that it is a general characteristic of fibroblasts to multiply when packed tightly together. It seems possible that after advancing for a distance the rate of movement of some of the cells is checked, thus producing a 'piling up' of the cells following and resulting in the concentration necessary to induce mitotic activity. This would automatically permit a further advance and a similar check.

It seems likely, therefore, that the general process of scale formation is induced by the lateralis branch of the vagus nerve. In *S. trutta* an apparent exception to the scheme outlined above is to be found in a small mid-dorsal patch of papillæ which arise as an independent centre of fibroblastic activity a little behind the supratemporal canal.

Most recent investigators have concluded either that the fibrillary plate of the scale is laid down first or that the plate and the 'hyalodentine' layer are