I am loth even in appearance to temper these remarks by discussing Mr. Twyman's suggested alternatives, but since he intends temporarily to adopt one of them, I am tempted to do so. Spectroscopic (or spectrographic, which, as Prof. Curtis would probably agree, better describes modern practice) analysis seems preferable to spectrochemical analysis for the following reason. There are three experimental 'hall-marks' of an atom—atomic weight(s), spectrum, chemical properties—and, correspondingly, three methods of analysis, which might be called 'mass-analysis' (by Dr. Aston's instrument, for example), 'spectrographic analysis' and 'chemical analysis'. 'Spectro-chemical analysis' would then indicate an analysis jointly by spectrographic and chemical methods—a not uncommon process, I believe, as in cases where the qualitative analysis is spectrographic, and the quantitative, chemical. It would be a pity to give the name 'spectro-chemical analysis' to a process in which chemical methods are not used.

I repeat my opinion, however, that the proper course to take would be to call spectrum analysis by its own name, and let the penalties of misunderstanding fall on those who are ignorant of physical nomenclature rather than on those who conscientiously learn it.

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[1] NATURE, **136**, 609, Oct. 12, 1935.

Antagonistic Effect of Potassium Iodide in Baldness due to Thallium Acetate

THALLIUM salts administered per os or subcutaneously in the body disturb the equilibrium of mineral metabolism[1], bring about lesions in the central and peripheral nervous system[2], cause disturbances in the endocrine system[3], have a deleterious effect upon the heart[4], bring about disturbances in the digestive tract[5] and kidneys[6] and have unfavourable effects upon development and growth of animals[7]. Further, the daily administration of thallium for a longer period of time brings about in animals, especially in young ones, under-development of skin[8], atrophy of hair follicles, hyperplasy and hypertrophy of sebaceous glands[9], degenerative changes of hair[10], and alopecy[11].

In our experiments we used six groups of rats. The first three groups received daily, per os, 3, 4 and 6 mgm. of thallium acetate per 1,000 gm. weight, respectively. The other three groups received the same quantity of thallium acetate per os, and in addition, each animal received daily, subcutaneously, 0·75 c.c. of a two per cent solution of potassium iodide. After 12–16 days, the rats which received only thallium acetate started losing their hair and at the end of the experiment (35 days) all the surviving animals had lost most of their hair, and some of them, especially those which were getting higher doses, became entirely bald. On the other hand, the rats which received thallium acetate per os and potassium iodide subcutaneously retained completely their hair coating. Also, the mortality in the groups with potassium iodide was smaller, which indicates that potassium iodide reduces the toxicity of thallium acetate.

The object of further experiments being carried out by us is to determine whether other salts of iodine, such as sodium iodide, lithium iodide, calcium iodide and magnesium iodide, prevent partly or entirely the loss of hair caused by thallium and reduce the deleterious action of thallium upon organisms.

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A 'Dope' for Embedding Wax

ATTENTION has been directed by Higgs[1] to the effect of small quantities of petroleum ceresins in causing paraffin wax to cool in a microcrystalline state. It seemed possible that this effect might be valuable in the technique of cutting paraffin sections. During this summer we have been using, for the routine sectioning of early amphibian embryos, a paraffin wax mixture, without addition of beeswax but containing 0·5 per cent of petroleum ceresin which was supplied by Messrs. Shell-Mex and B. P., Ltd. The results have been all that could be desired, the wax cooling with a very fine texture even when the embedding dish was allowed to cool in the air without being immersed in water. It is necessary to use a mixture having a melting point, before the addition of ceresin, slightly lower than is normally appropriate. The electrostatic properties of the wax appear to be unaltered. The 'dope' may be particularly useful in embedding large objects, in which ordinary wax tends to cool too slowly in the centre of the block.

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Corophium curvispinum, G. O. Sars, var. *devium*, Wundsch, in England

WHILE passing through Tewkesbury on June 30, 1935 I found thirteen specimens of *Corophium curvispinum* var. *devium*, inhabiting tubes made upon submerged plants in shallow water near the left bank of the River Avon about two hundred yards below King John's Bridge. From the associated flora and fauna I believe this water to be permanently fresh, though I took no measurements of salinity. Prof. Wundsch has kindly confirmed my identification.

The species *C. curvispinum* was described and figured by Sars[1] from the Caspian Sea in 1895. In 1912, Wundsch[2] described *C. devium* as a new species from fresh water in the Müggelsee, near Berlin. Later

Behning[3], having seen specimens from other localities, reduced *C. devium* to a freshwater variety of *C. curvispinum*, an alteration to which Wundsch[4] agreed. In both these papers Wundsch gives figures adequate for identification.

Wundsch[5] gave a map of the known distribution of the variety in 1919, and Wolski[6] in 1930 gave a list of localities without adding much to the range known in 1919. It inhabits the lower and middle courses of rivers running into the Caspian Sea (Volga and its tributaries), the Black Sea (Danube, Dnieper and Don) and North Sea and Baltic (Niemen to Elbe): also two lakes in the Caucasus near the Caspian Sea. It has not yet been found west of the Elbe.

Wundsch[4] stated that in 1915 this variety was spreading rapidly in Germany, moving through canals and rivers from east to west and usually downstream.

It is unlikely to have been introduced from its European localities with living fish, since no example of such importation of stock to the Severn or Avon is known to the secretaries of the Bristol Naturalists, the Fishmongers Company or the Severn Fishery Board. But ships from the Baltic and the Black Sea reach Bristol Docks, and might carry specimens in the fouling on the hull. Nothing is known of the resistance of this variety to sea-water travel.

It would be of interest to ascertain the present distribution of this variety in England, and in Europe west of the Elbe. It might thus be made clear how it reached Tewkesbury, and how rapidly it is able to spread in our rivers.

Its usual localities are the lowland fresh-water reaches of sluggish rivers. It lives in tubes made of mud upon weed or piles. Specimens of *Corophium* found burrowing in mud are almost certain to be the common species *C. volutator*.

I shall be pleased to identify any specimens of *Corophium* sent me. The general aspect of species of this genus is clearly shown in the drawings of Sars[7].

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Points from Foregoing Letters

A MODEL consisting of a football bladder and rubber blocks, to illustrate how early forms of sea-urchins (of Cambrian age) may have behaved under tidal conditions, has been constructed by Dr. W. K. Spencer. The model opens and closes automatically under the influence of changes in hydrostatic pressure, acting upon the elastic body-wall.

To elucidate the 'shape' of the benzene molecule, the principal lines of the infra-red spectrum of benzene containing heavy hydrogen, C_6D_6, are compared with those of ordinary benzene, C_6H_6, by a group of investigators from University College, London. The authors conclude that, as in the case of the Raman spectra, the apparently coincident frequencies are accidental, and consequently there is no longer any reason for physicists to reject the regular hexagon model accepted by chemists for the benzene molecule.

An increase in the intensity of cosmic rays was observed by Kolhörster during the outburst of Nova Herculis, between 8 h. and 16 h., when that star was in the 'field' of his apparatus, and he therefore suggested that cosmic rays originate in novæ. Drs. J. Barnóthy and M. Forró now find an increase in the intensity of cosmic rays between 8 h. and 16 h. as a normal diurnal variation, which they tentatively ascribe to changes in the earth's magnetic field and in the outer temperature.

It has been suggested that there are more positive than negative particles in cosmic 'rays'. H. J. Walke enumerates several objections to this view. He prefers Ross Gunn's explanation of the east-west asymmetry of the cosmic rays, namely, that it is due to differences in the penetrating power of positive and negative particles and in the spiral paths which they describe under the influence of the earth's magnetic field.

Moon and Tillman have found that the radio-activity induced in silver by neutrons slowed down by passage through a thin layer of paraffin wax is increased when the wax is cooled by liquid air. Prof. P. Lukirsky and T. Zarewa, using a thicker layer of paraffin, failed to observe this temperature effect; but now, using thinner layers, they confirm it. With thicker layers, the increase in the activity of the neutrons, caused by lowering the temperature, is apparently counterbalanced by loss due to absorption.

C. H. Douglas Clark and J. L. Stoves claim that the modification to Morse's relation between the equilibrium internuclear distance r_e and the vibration frequency ω_e of 'di-atoms', suggested by one of them (C. H. D. C.), gives better approximations to the actual experimental values than either Allen and Longair or Badger's suggestions.

The charge of an electron calculated from X-ray wave-lengths determinations comes to $4{\cdot}80 \times 10^{-10}$ E.S.U., whilst the usually accepted value obtained from the rate of fall of electrified droplets is $4{\cdot}77 \times 10^{-10}$ E.S.U. Dr. Gunnar Kellström has re-determined the viscosity of dry air and finds a value different from that used by Millikan when he calculated the electronic charge by the falling droplets method. The recalculated electronic charge agrees with that deduced from X-ray wave-length determinations.

Records of atmospherics obtained with a galvanometer (of period 1 second) by N. S. Subba Rao indicate that lightning flashes have, in addition to the 'fine' structure revealed by the cathode ray oscillograph, also a 'gross' structure, due to the fact that the flashes occur in groups of 4–12. The duration of such a group is about $\frac{1}{2}$ sec. Each member of the group may be due to 1–12 separate strokes as observed by Schonland and Collens, and these strokes may themselves be composite. This complex nature of the electric discharge may account for the divergence in the observations of lightning flashes reported by various investigators.

Experiments upon rats, carried out by O. V. Hykeš and F. A. Diakov, indicate that potassium iodide reduces the toxicity of thallium acetate, and in particular prevents the loss of hair caused by thallium poisoning.