

On the roof will be placed meteorological instruments. In the basement are workshops, store-rooms, engine rooms, and mechanician's lodging, a cold aquarium, fish-breeding plant, and a room protected against tremors by special pillars, and thus permitting of the finest physical measurements and photographic work.

Each working-place has a double aquarium with flowing Balaton water and aeration, a supply of three kinds of electric current, of gas made in the institute from benzol, of compressed air and vacuum draught, and of drinking water, and a hot-water heating apparatus. Water is sucked from a point 200 metres out in the lake, through a pipe of eternite into three successive basins, where the sediments settle, and is then sent by a bronze centrifugal pump to the cisterns in the tower; these last are painted with inertol, and the water supply pipes in the building are of lead. The working aquaria are modified from the Naples model; three of them can receive artificial or actual sea-water, which is stored in a stone cistern.

The thermostats, kymograph, nephelometer, and colorimeter, lighting, photographic, and all other apparatus are of the very latest and best design in whatever country that could be found.

The lodgings in the adjoining block provide twenty-six beds, in fifteen rooms; these are at present partly occupied by the staff. There are also a dining-room, servants' bedrooms, and the usual offices.

The programme of the Institute is, first, the biological investigation of Lake Balaton and other Hungarian waters; but it will undertake all kinds of research in general biology and physiology for which its resources are adapted. At certain times educational courses will be conducted, especially for teachers in secondary schools. It is particularly hoped that foreign workers will avail themselves of the facilities offered. Tables will be allotted to them according to the available room. A monthly fee of 125 penzö (about 14s. 4d.) covers a fitted working place, lodging, and research material up to 25 penzö (say 3s.). A place can only be retained so long as it is really used for work. His Excellence the Minister of Education expressed to me the wish that it might be possible to arrange for an exchange of similar facilities between Tihany and similar laboratories in the British Dominions at home or overseas; he would also be glad to see an exchange of publications. Should the publication of this appeal in NATURE meet the eyes of the very variously constituted bodies that govern such institutions within the British Commonwealth, they will doubtless respond to it in a friendly spirit. Those who wish to have complete sets of the *Annals* and other publications of the institute should not wait until the earlier numbers are out of print. Correspondence may be addressed to the Director, Dr. Hankó, Magyar Biológiai Kutató Intézet, Tihany, Balaton, Hungary.

The Undercooling of Some Aluminium Alloys.

ALTHOUGH the undercooling of pure metals was observed by Roberts-Austen so long ago as 1898, no experimental data have so far been published regarding the supersolubility curves of alloy systems, although explanations of certain structures have been based on their existence particularly in regard to eutectics. The recent May Lecture of Sir Henry

are available, and with their aid an explanation of the structures of the aluminium-silicon alloys can be offered with a considerable degree of certainty.

The experimental method adopted consisted in melting the alloy in a thin copper pot, the wall thickness of which did not exceed $\frac{1}{16}$ in., raising the melt to a temperature of about 200° C. above the liquidus and then quickly dropping the pot into a copper tube immersed in a freezing mixture. A cooling curve was obtained on a Rosenhain plotting chronograph, readings being taken every 10° C. at first and every 5° C. after the first arrest had taken place. The general arrangement is shown in Fig. 1.¹ The results are represented by the dotted lines in Fig. 2, the continuous lines in the latter indicating the temperatures of the changes as normally accepted. The dotted lines indicated in Fig. 2 are thus representative of a definite rate of cooling, but there are good reasons for the belief that they approximate closely to the true supersolubility curves. In the first place, as will be shown later, they offer good grounds for the interpretation of the microstructure observed in the ingots, but far stronger reasons for this belief lie in the following facts.

As is well known, the aluminium-silicon alloys are normally more or less brittle. When, however, to the melt is added a small trace of sodium or other 'modifying' material, their mechanical properties and structures are radically effected. If the 'modification' is due to crystallisation along the supersolubility curves, it should follow that the freezing curves after modification should at any rate approximately coincide with the latter curves themselves. Secondly, the 'modification' should inhibit the attainment of a second series of supersolubility curves lying below those previously obtained. Miss Gayler has shown that both these results can be obtained. The freezing diagram obtained from the 'modified' alloys lies remarkably near to that of the supersolubility curves in Fig. 2, and systematic under-

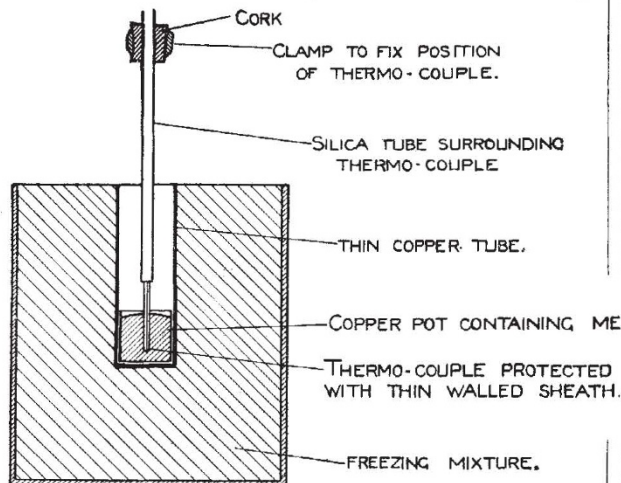


FIG. 1.—Diagram of apparatus.

Miers to the Institute of Metals on "The Growth of Crystals in Supersaturated Liquids" is now followed by a paper by Dr. Marie L. V. Gayler, delivered before the Institute of Metals on Sept. 7, on the effects of undercooling in some alloys of aluminium, in particular with silicon. The work was carried out for the Engineering Research Board at the National Physical Laboratory under the supervision of Dr. W. Rosenhain and breaks entirely new ground. For the first time the supersolubility curves for an alloy system

¹ This and other illustrations are reproduced by courtesy of the Institute of Metals.

cooling does not occur in the 'modified' alloys, supersolubility curves for which could, therefore, not be obtained.

The correlation of the foregoing curves with the microstructures is excellently effected. In Fig. 3, it

structure of which is shown in Figs. 4 and 5, however, silicon separates first at some point on the supersolubility curve N'I. The composition of the liquid then follows NS until S is reached, when aluminium separates spontaneously; the course of the liquid

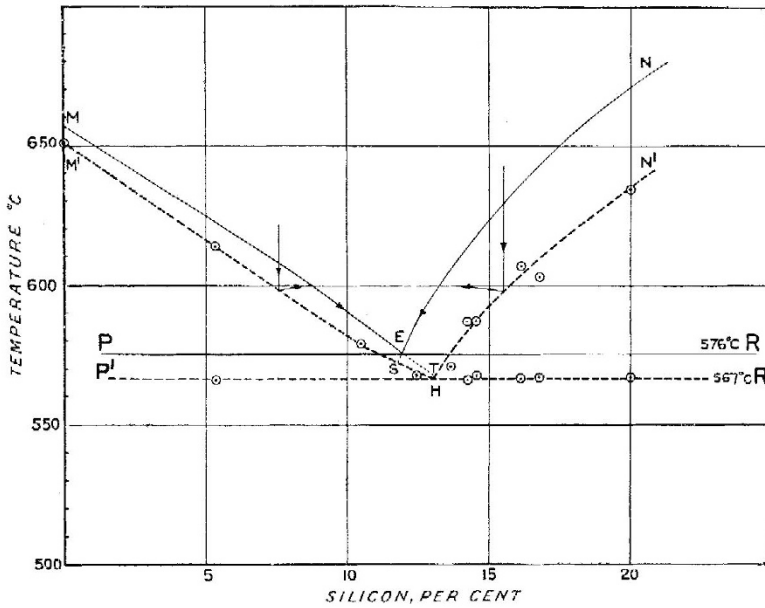


FIG. 2.

will be seen that besides the primary dendrites of aluminium, coarse silicon is present; this suggests that in this alloy, containing 10 per cent. of silicon, aluminium separates on cooling at a point on the supersolubility curve M'H in Fig. 2. The composition of

then probably oscillates between SH and TH until the point H is reached, when aluminium and silicon separate together. It will be seen in Fig. 5 that the primary silicon is surrounded by dendritic aluminium.

The structures of the ingots obtained are of much



FIG. 3.—10.0 per cent. silicon. Centre of ingot. $\times 150$.

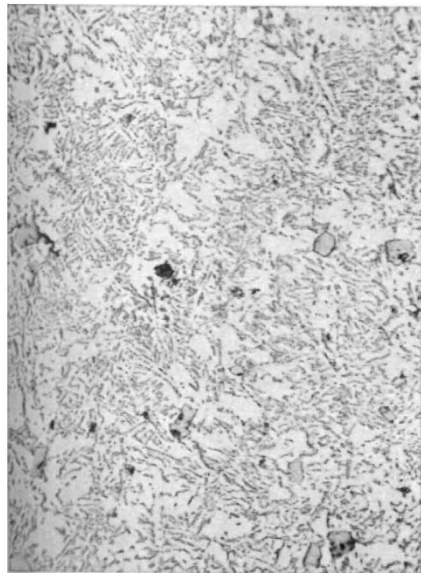


FIG. 4.—13.2 per cent. silicon. Edge of ingot. $\times 150$.

the liquid then follows MET until the silicon supersolubility curve is reached at T, when silicon separates along TH until the hypereutectic point H is reached and both constituents separate simultaneously. In the alloy containing 13.2 per cent. of silicon, the

interest, and the results may not improbably throw considerable light on the general question of ingot crystallisation. Contrary to what would, perhaps, generally be expected, since the outside of the ingot must be the more rapidly cooled, the structure of the

outside rim to a depth of approximately $\frac{1}{16}$ in. is much coarser than that inside. The character of the crystals is also different, particularly that of the silicon,

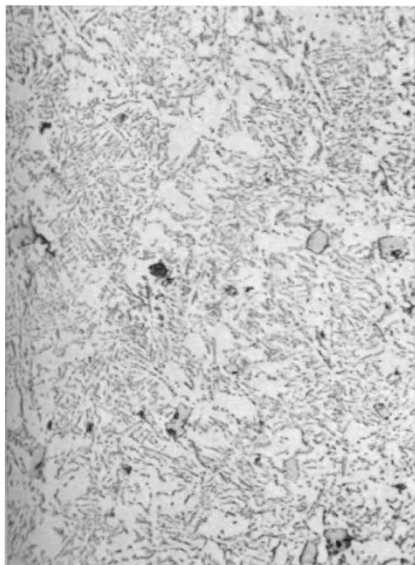


FIG. 5.—13.2 per cent. silicon. Centre of ingot. $\times 150$.

which takes a definitely needle shape, while the silicon in the centre of the ingot is in more rounded particles and much finer needles.

F. C. T.

University and Educational Intelligence.

LONDON.—The title of emeritus professor of pathology in the University has been conferred on Sir Frederick Andrewes, who retired from the University professorship of pathology tenable at St. Bartholomew's Hospital Medical College in July last.

The Senate has decided to make a grant of £200 a year for five years towards the cost of maintaining the British Institute in Paris.

The following doctorates have been conferred: D.Sc. in Chemistry—Miss P. V. McKie (Bedford College), for a thesis entitled "The Interaction between Nitric Acid and Unsaturated Compounds"; and Mr. A. W. Chapman (Imperial College (Royal College of Science)), for a thesis entitled "Studies of Isomeric Change—with special reference to the Molecular Rearrangement of Imino-aryl Ethers." D.Sc. in Zoology—Miss H. S. Pearson (University College), for a thesis entitled "On the Skulls of Early Tertiary Suidæ, together with an Account of the Otic Region in some other Primitive Artiodactyla." D.Sc. in Veterinary Pathology—Mr. F. C. Minnett, for a thesis entitled "The Standardisation of Immune Serum and the Nature of Immunity in Foot and Mouth Disease," and other papers.

A free public lecture on "Recent Discoveries through New Light on some of the Commonest Insects" is to be given by Prof. E. B. Poulton, at Bedford College for Women, at 5.15 on Jan. 31.

WITH the view of encouraging original research in sanitary science, the Grocers' Company is offering scholarships of the annual value of £300 each, plus a further amount for expenses. The scholarships are tenable for one year, but renewable up to three years. A form of application can be obtained from the clerk of the Grocers' Company, Grocers' Hall, E.C.2.

THE Pan-American Union has issued in Washington, D.C., two pamphlets containing the projects of the International Commission of Jurists, "Public International Law" (pp. 40), and "Private International Law" (pp. 68). These drafts are the findings of sessions held at Rio de Janeiro in April and May 1927, and are to be submitted for the consideration of the sixth International Conference of American States which will convene at Havana, Cuba, in January 1928. Under Public International Law two of the earlier projects are (v.) Exchange of publications and (vi.) exchange of professors and students. The remuneration of the professor shall be paid by the institution which has appointed him, unless his services shall have been expressly requested, in which case his remuneration shall be borne by the institution which invited him. In Private International Law, Chap. ii. is on domicile: "The domicile of diplomatic officials and that of individuals temporarily residing abroad in the employment or commission of their government or for scientific or artistic studies, shall be the last that they had in their own territory."

THE annual meeting of the Science Masters' Association will be held on Jan. 4-6 at the Imperial College of Science, under the presidency of Sir Richard Gregory. Evening meetings will be held at King's College for Women, Campden Hill Road, Kensington, W.8, where the presidential address on "Contacts of Science and Literature" will be delivered on Jan. 4. The programme includes discussions on the need of scientific investigators for the agricultural industries overseas, to be opened by Sir J. B. Farmer and Capt. Irby (Colonial Office), and on industrial openings in scientific technology, to be opened by Prof. W. A. Bone, and lectures by Dr. J. W. T. Walsh on modern methods in photometry and by Prof. J. C. Philip on charcoal and its activation. Visits have been arranged to the London docks, the United Dairies, Ltd., the Lighting Service Bureau, the Gas, Light, and Coke Co., and to the new laboratories at Highgate School. During the meeting there will be exhibits by members of the Association and by instrument makers and related firms, and also a display of books by leading publishers. Correspondence should be addressed to the organising secretary, Mr. I. M. Bankes-Williams, at the Chemistry Department, Imperial College of Science, South Kensington, S.W.7.

THE October number of the *University Bulletin*, issued by the Association of University Teachers, contains a report on the representation of teaching staffs upon university bodies. This is the outcome of the labour of a committee appointed to inquire into the subject. A sufficient warrant for undertaking such an inquiry is to be found in the University Grants Committee's report of 1925, in which attention was directed to the reasons why lecturers as well as professors should be accorded a more clearly recognised position in the government of the universities, and, in particular, why they should be represented on the executive governing bodies. Appended to the report of the Association's committee, which concludes by reaffirming the opinions of the University Grants Committee, is a useful tabular statement showing the actual position in the civic universities of England and the University of Wales. In the same number appears, under the title "Jottings from the University of Utopia," a summary of advanced views on adult education, vocational guidance, and "earning while learning." In an article on the "wider aspects of extra-mural work," emphasis is laid on the value to the civic universities of their adult education work as a means of keeping them in touch with public opinion in the regions they serve.