The Hungarian Biological Research Institute.

By Dr. F. A. BATHER, F.R.S.

ON Sept. 5 the Regent of Hungary, Admiral Horthy, inaugurated the new buildings of the Hungarian institute for biological research at Tihany on the shores of Lake Balaton (Fig. 1). This institute has been founded through the exertions of the Minister for Education, Count Kuno von Klebelsberg, in pursuance of the general policy of the Government to restore the various cultural institutions of Hungary to the same high level as they occupied before the War, and where possible to raise the standard. It is gratifying to note the importance which His Excellency has attached to the development of the natural sciences. During his term of office one new university has been founded, and two rendered homeless as a consequence of the War have been re-established

of an age ranging from Miocene to Permian. This is particularly the case at Tihany, where Eocene rocks capped by basaltic tuff form a peninsula which stretches more than three-quarters of the way across the lake. On the summit of the cliff stands the Benedictine abbey, founded in 1054, and on the strip of shore at its foot, between a small hotel and a villa of the Archduke Joseph, is the site of the research institute, enlarged to about four acres by building out on the shallow sandy lake floor. This site will be occupied by four main blocks: the laboratory building, lodgings for visiting workers, residence of the staff, and an aquarium open to the public; only the first two are completed.

The laboratory building consists of basement,

FIG. 1.—Hungarian Institute for Biological Research, Tihany, Lake Balaton.

in fresh situations. Among the new developments may be mentioned the excellent modern equipment of the medical faculty at Debrecen, but the support accorded to pure biological research through this institute at Tihany is a still more manifest sign of this enlightened policy.

The present institute was founded in 1926 in continuation and development of the Biological Station which was maintained at Révfülöp by the Hungarian National Museum. Work will continue in co-operation with other laboratories in Hungary, but the new situation and the admirable arrangements will greatly facilitate research.

Lake Balaton is the largest piece of fresh water in the south of Europe. With a length of 51 miles, it varies in width from two to nine miles, and attains in places a depth of 425 feet. It is rich in fishes and other forms of life. While the southern shores are low and flat, those on the north are formed by picturesque hills sloping steeply to the water. These hills owe their existence to a capping of Pliocene basalt and other volcanic rocks, which have preserved from complete erosion the underlying softer rocks.

raised ground floor, first storey, and a tower which adds another storey, and a flat roof with a small room on it. The institute is organised in two departments. The first, which occupies the ground floor, and is immediately under Dr. Béla Hankó, administrative director of the Institute, is devoted to zoology, botany, and hydrobiology. It contains the reception room and the laboratory of the director, the library, a laboratory for the botanist, one for the bacteriologist, a microscopical laboratory with six tables, and a room for the laboratory assistants.

The second department, which is on the first floor, conducts physiological, physical, and chemical research, and is directed by Dr. F. Verzár of Debrecen. It contains the laboratory of the director of the physiological assistant and a laboratory for the official chemist, two laboratories for single research workers, a balance-room, and an assistants' room. There is also a large laboratory for demonstrations to twenty students.

The tower contains an optical room, a drawing and photographic room, with a dark room, and the cisterns for Balaton water and artificial sea-water.

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 innertol, 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

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