

will be entrusted to a committee of fifteen members, including the Vice-Chancellor, the rector of the Imperial College, and other members appointed as to a bare majority by the Senate, and as to the remainder by the governing body of the Imperial College. University and King's Colleges would each be represented by two of the appointees of the Senate, and three-fourths of the whole would consist of men of affairs and experts in the branches of technology dealt with. The income of the Imperial College and that available for the departments of engineering in University and King's Colleges would be at the disposal of this committee; and the annual budget of the committee would be submitted to the Senate, the governing body of the Imperial College, and the delegacies of King's and University Colleges.

Such, in very brief outline, and with many omissions, especially that of the important proposals with regard to medical education, is the scheme of the Commissioners, and they estimate that 99,000*l.* a year will be required to carry it into effect. They also consider that the headquarters of the University should be situate in Bloomsbury.

They have evidently done their best to meet the reasonable desires of all interests. The professors will have a freedom of teaching and testing their pupils which they have not enjoyed before. The internal students will be members of a more real and efficient teaching university. External candidates will probably have a better test than that to which they have been accustomed. These advantages must no doubt be purchased by some sacrifices in so far as they touch vested interests, but the whole scheme provides a much more satisfactory prospect both for internal and external students than that now in force.

RECENT HYDROGRAPHIC INVESTIGATIONS.¹

IN the first of the publications referred to below, Dr. Rolf Witting gives an account of the hydrographic observations—sea-temperatures, salinities, oxygen-contents, current and ice observations—made in the Gulfs of Bothnia and Finland during the year 1911 by the Finnish hydrographers. The paper consists almost entirely of tables, and these are models of clear and orderly arrangement.

The second publication contains the hydrographic data collected during the voyage to Spitsbergen, in 1910, of the Norwegian ship *Farm*. The observations are discussed by Drs. Helland-Hansen and Nansen, and deal chiefly with the distribution of the Atlantic current in the sea to the west of Spitsbergen. A considerable part of the paper is taken up with a

discussion of the errors of the hydrographers who had previously investigated the same area; but in addition to this the authors describe the gradual disappearance of the Atlantic current to the north-west of Spitsbergen, as this water becomes diluted by lighter arctic water flowing round the South Cape. There is a discussion of the parallelism in the annual variations in temperature of this Atlantic Spitsbergen current, and those of the Atlantic Norwegian stream. "Temperature anomalies" are compared—that is, the deviations, in each year, from the mean of a number of years. The variations in temperature of the Atlantic Spitsbergen stream are, then, roughly parallel to those of the Norwegian stream, *if the former are compared with the latter of two years' previous date*. That is, the water flowing to the north from the Farøe-Iceland channel takes about two years to travel from the latitude of 62° N. to that of about 78° N. The variations in temperature anomaly in the sea to the west of Spitsbergen are also parallel to the variations in the area of ice-free water in the Barentz Sea in May of the same year.

The third paper is of considerable interest and importance. After indulging in a polemic with reference to the erring Swedish hydrographers, Dr. Nansen considers the mode of origin of the cold water occupying the basins of the North Atlantic and Norwegian seas. These water-masses are very homogeneous. At the bottom of the Norwegian Sea there is a salinity which varies only between 34.90 per cent. and 34.92 per cent., and thus requires very careful investigation in order to disclose differences of a real nature. The submarine Farøe-Iceland ridge divides the northern ocean into two masses with respect to the temperature of the bottom water: at a depth of about 1000–2000 mètres the water on the Atlantic side of the ridge has a temperature of about +2° C. to +3° C.; on the Norwegian side the temperature of the sea-water at the same depth is about –0.5° C. to –0.8° C.

How does this cold and dense bottom water originate? It does not come from the southerly-flowing, cold polar currents, for this water is of low salinity, and in spite of its low temperature its density is less than that of the bottom Atlantic and Norwegian water, so that it cannot sink to near the sea-bottom. It does not proceed from melting ice, for water of such origin has also a very low salinity, and, notwithstanding its low temperature, its density is also low. The southerly-flowing polar currents, indeed, protect the underlying warmer water-masses from cooling, and melting ice has the same effect. In both cases the sea is covered with low-saline water which does not mix by convection with that beneath it. In order that a vertical circulation, accompanied by the formation of a cold bottom stratum of water, may occur, certain conditions are necessary:—(1) The water at the surface of the sea must not be in rapid horizontal movement; the best conditions are those in the centre of an area possessing a cyclonic circulation.

¹ (1) "Abhandlungen der finländischen hydrographischen-biologischen Untersuchungen." No. 10. Pp. 132+4 Taf. (Helsingfors, 1912.)

(2) "The Sea West of Spitzbergen. The Oceanographic Observations of the Isachsen Spitzbergen Expedition in 1910." Vidensk. Skrifter. I., Mat.-Naturv. Klasse, No. 12. Pp. 80+6 plates. (Christiania, 1912.)

(3) "Das Bodenwasser und die Abkühlung des Meeres." *Internat. Revue Ges. Hydrobiologie u. Hydrographie*, Bd. v., Heft 1. Pp. 42+12 figs. in text. (Leipzig, 1912.)

(2) The surface water must be of approximately the same salinity as that of the sea bottom; if it has a much lower salinity, its density may not be increased by a reduction of temperature to an extent sufficient to set up convection movements reaching to the sea-bottom. (3) It must be cooled to a slightly lower temperature than that of the water at the sea-bottom, for its adiabatic contraction, by pressure, as it sinks, must warm it slightly; this may be the cause of the slight increase in the temperature of oceanic water as we approach great depths—an increase which has been attributed to the emission of heat by radio-active substances in the oceanic bottom-deposits. (4) The formation of ice on the sea-surface may favour convection currents by raising the salinity of the superficial water; but this is not an important factor.

The cold bottom water of the North Atlantic Ocean originates in a restricted area of sea, outside the boundaries of the southerly-flowing polar current, and lying to the south-east of Greenland. Some of this water may also proceed from the surface of the Norwegian Sea after flowing over the Farøe-Iceland ridge.

Incidentally Dr. Nansen directs attention to the presence of Mediterranean water in the channel between Ireland and Rockall. This originates from warm and dense water flowing out as an intermediate current through the Straits of Gibraltar. The presence of this water in British seas was pointed out by Dickson in 1909 as the result of observations made in 1903 by Wolfenden. Dr. Nansen in 1909 referred to the methods of these observations as "so inaccurate as to be of little use." Nevertheless, he now adopts the conclusions drawn from them, without, however, referring to Dickson's prior discovery.

J. J.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH.

SOUTH AFRICA has decided to have an institute for medical research on the same lines as the Pasteur Institute in Paris, the Lister Institute of Preventive Medicine in London, or the Rockefeller Institute in New York. To this end a new building is now in process of erection in Johannesburg, and is expected to be complete in about twelve months.

A site has been provided by the Government, and we understand that the cost of building and equipping the new institute will be provided by the Witwatersrand Native Labour Association. The maintenance of the institution will be undertaken by the Government of South Africa and the association in equal shares.

A very satisfactory feature of the institute will be its close proximity to the largest hospital in South Africa, with which it is intended that it should work in conjunction. It will also be equipped with four wards for the purpose of treating patients, who will be the subject of special study.

From the present plans, the institute seems to be suitably arranged, and will be an imposing structure. It will comprise, in a main block, forming a two-storied quadrangle, the institute offices, experimental and observation hospital, animal house, mortuary, and director's house. Ample space is allowed here for future extension. Of this main block the northern and southern sides are prolonged eastwards and westwards to form two further quadrangles. These will contain the hospital wards and research laboratories, also library, museum, and further laboratories. The building will carry as well a lecture theatre, basement workshops and storage rooms, and a number of rooms for miscellaneous scientific purposes. A dome eighty feet in height will crown the building, and will carry a finial emblematic of the surrender by Death of his secret, and we understand that a second dome of equal magnitude is aspired to. Although we realise that an institute which is intended to render valuable service to the State should be housed in fashion suitable to the importance of the work it is to undertake, we sincerely hope that contemplation of the domes and the finial will not distract the attention of the authorities from the fact that the success of their scheme will essentially depend upon the *personnel* of the staff and the funds made available for scientific investigation.

The research work of the institute is, we understand, to be primarily directed towards the industrial diseases of the Transvaal, but all diseases will come under its scope. It is intended that research fellowships shall be available for medical men, in order that they may carry out special lines of investigation; also it is hoped that in the near future medical students will be enabled to undertake courses in pathology and bacteriology at the institute, of a character which can now only be attended in Europe.

Two appointments to the staff of the institute have already been made: the director of the institute will be Dr. Watkins Pitchford, and the statistician Dr. G. D. Maynard, both of whom have already accomplished sound work in connection with one or other of the public health organisations of the colonies now forming the Dominion of South Africa.

EDUCATION OF THE AUDITORY CENTRES.¹

PROF. MARAGE, who is well known as an otologist and for his researches in physiological acoustics, has issued a small but suggestive pamphlet on what he terms the education of the auditory centres. It is known that there are cases in the clinique of the aurist where there is sensitiveness to even feeble noises while there is deafness to music and to speech. In others the patient may hear noises, music, and even speech sounds, but without any understanding of the meaning of the speech sounds. Prof. Marage

¹ "Education et Rééducation des Centres auditifs." By Prof. Marage. Pp. 15. (Paris, 19 Rue Cambon.)