

posts of the proposed single Scientific Fisheries Division, and it can be recruited to full strength as men of the requisite ability become available.

As a professor in a great university I cannot recommend my first-class man—I do not refer merely to a first-class degree—to apply for a post in research in the service of the State which is inferior to that of the higher grade of the Civil Service. The mental qualifications for research posts are far rarer than for the ordinary work of administration. The holders of such posts cannot be transferred from department to department, so that proper recognition must be guaranteed them from the start. All of us must cordially endorse the resolution unanimously passed by the council of the British Association: "That the council considers that no scheme of payment of professional scientific men in the service of the State is satisfactory which places them on a lower level than that of the higher grade of the Civil Service." If science is to work for and with the State the Treasury must cease treating its scientific as inferior to its administrative services. There are difficulties, of course, in blending the two services, for science will be killed if it becomes bureaucratic; at the same time it must not be allowed to become an underling to the present bureaucracy.

In conclusion, it is interesting to note that while the administrative staffs of the fishery departments of most civilised countries are recruited almost solely from men who have been trained in science, that is not so in this country. The tremendous development of Norwegian fisheries is obviously due to one man, who was first and foremost always a scientific man. The great development in Germany before the war was due to scientific men. The employment of fishery officers who have some knowledge of the conditions of life of the living fish is obviously of primary importance. The users of trawlers and the herring drifters are increasingly taking more and more interest in the lives of their prey, and the Fisheries Departments should not merely follow their lead, as they will ultimately have to do, but should also, as in other countries, seek for inspectors who, at any rate, have the fundamental scientific knowledge upon which alone deductions as to the fish with which they have to deal can be made profitably. Every inspector should surely be able to answer from his own knowledge the ordinary points raised in respect to the lives of commercial fish and in respect to the possibilities of deterioration and pollution on their way to market. The training for such is that broad training in science which is provided in all the greater universities of the kingdom, and the Departments need feel no fear as to the lack of competition for their posts if they adopt the right scheme.

J. STANLEY GARDINER.

Zoological Laboratory, Cambridge,  
January 8.

**The Central Meteorological and Geodynamic Institute, Vienna.**

THE Central Meteorological and Geodynamic Institute in Vienna is the oldest meteorological institute in the world. It was founded by the Austrian State in 1851, at the request of the Vienna Academy of Science, with the object of developing the study of meteorology and terrestrial magnetism, and for the past seventy years has served both science and practical life.

In consequence of the war and the subsequent peace the future activities of the institute are in jeopardy. The impoverished little Republic of Austria has not the necessary means for carrying on the work of the Central Institute.

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The undersigned feel it their duty, as former and present directors of this old institute, to inform the meteorological institutes, societies, and men of science all over the world who have any scientific or practical connection with the Central Institute in Vienna and exchange publications with it, of the pressing need of the Central Institute.

In acting thus they take the point of view that a scientific institute like the Central Institute is, to a certain degree, the public property of all the cultured nations of the earth, and as such these are all interested in its existence. The undersigned therefore plead for financial aid for the Central Institute.

The low value of the Austrian kroner (less than two Swiss centimes) makes it, on the one hand, easy for foreign States to help, but, on the other, the Austrian State endowment, in spite of repeated increases, is ever insufficient.

The Central Institute can now no longer publish its year-books, even for diminished Austria, although the yearly printing expenses would only be 1000 Swiss francs. The year-books, however, as they contain the results of observations—that is, definite facts—represent the basis of the development of our science.

It is, moreover, impossible for the Central Institute to carry on its work. It has become impossible to procure instruments; hydrogen for pilot-balloon ascents is too expensive; and the same applies to rubber balloons for recording ascents. It is impossible to keep the library up to date, as the smallest foreign books or journals cost hundreds of kroner. Consequently, meteorologists cannot follow the trend of work abroad and so keep up with the times.

It will be possible to issue the weather charts for six months more, until the stock of paper is exhausted, then this issue must cease. It will be possible with difficulty to keep up the seismic observatory in Vienna; the stations at Grätz and Innsbruck must, on the other hand, be given up, as the expenses of running them are too heavy. There can be no question of recommencing the registration of terrestrial magnetism which was carried out at the high-altitude station at Obir before the war.

No matter where we turn we find the same cheerless decay.

We refrain from enlarging on the rôle which the Austrian school has played in meteorology during the last fifty years. We venture, however, to name a few books which have emanated from the Central Institute of Vienna:—*Meteorologische Zeitschrift* since 1866; J. Hann, "Handbook of Climatology"; J. Hann, "Text-book of Meteorology"; J. M. Pernter, "Meteorological Optics"; W. Trabert, "Text-book of Cosmical Physics"; and F. M. Exner, "Dynamical Meteorology." We beg that foreign States will remember the Central Meteorological Institute in Vienna from the titles of these books, and that help may be forthcoming.

F. M. EXNER,

Present Director.

J. HANN,

Former Director.

Vienna XIX, Hohe Warte 38, December 2.

**Tidal Power.**

ESTIMATES of the power to be obtained from the rise and fall of the tide are often greatly in excess of practical possibilities. If it is assumed that an estuary or reservoir of area A is enclosed by a dam at the outer face of which the difference of level between high and low water is H, then (*w* being the weight of the unit cube of water) the work which might conceivably be extracted from tidal action is  $w.A \frac{H^2}{2}$ . To