In the chief meizoseismal zone the shock was preceded by a very loud rumbling like the firing of a gun, and the perceptible movement, which occurred in three separate phases, was estimated to last about thirty seconds. The time of the shock within this area is known with considerable accuracy, the clock at the geodynamic observatory of Messina having stopped at 5h. 21m. 30s., or 4h. 21m. 30s. Greenwich mean time. On the Calabrian shores, the sea-waves were greatest at Pellaro, Lazzaro, and Gallico; in Sicily, near Briga, Riposto and Paradiso; they were distinctly perceptible at Malta, and were registered by the tide-gauges at Porto d'Ischia, Naples, Civitavecchia, Porto Corsini, and even in the neighbourhood of Venice.

Dr. Baratta attributes the disastrous results of the recent earthquake chiefly to three causes—the damage resulting from preceding earthquakes, and especially those of 1894, 1905, and 1907; the nature of the rocks on which the houses were built; and the wretched materials used and a system of construction in complete contradiction to the elementary rules that should govern all building in seismic countries. He gives the following scale of foundations, beginning with the worst:—yellow sands, sands and conglomerates in irregular beds, recent alluvia, Miocene sands and conglomerates, limestones and crystalline rocks. The recent earthquake he regards as far inferior in intensity to the first great shock of 1783, which produced permanent changes in the ground and attained a maximum mortality, though occurring in the daytime, of 77 per cent. at Terranova.

PHTHISIS AND INSANITY IN RELATION TO INHERITANCE.

A MEMOIR "On the Inheritance of the Diathesis of Phthisis and Insanity," by Dr. Charles Goring, has been issued by Messrs. Dulau and Co. in the series of Drapers' Company Research Memoirs, emanating from the Department of Applied Mathematics, University College, London. The methods used are similar to those employed by Prof. Pearson in his "First Study of the Statistics of Pulmonary Tuberculosis" and by Mr. Heron in his "First Study of the Statistics of Insanity," but the data are better in one respect, inasmuch as they are based, not on hospital or asylum cases, but upon information obtained respecting the inmates of convict prisons. Whether, however, such a sample can be correctly described as a random sample of the general population, as the author holds, is certainly open to question.

The conclusions reached by Dr. Goring are confirmatory of those previously put forward by Pearson and by Heron; for both phthisis and insanity he finds a very marked correlation between parents and offspring, the coefficients fluctuating round 0·5. In the case of phthisis no evidence is found of infection between husband and wife, the marital correlation being insignificant and negative. When, however, the author states, arguing against the view that the observed correlation between parent and child may be due to infection, that "upon statistical evidence one conclusion alone seems to follow inevitably and may be asserted without reserve. It is that such parental infection, if existent, is relatively inconsiderable, and that almost the whole of the parental association in phthisis represents an inherited predisposition in the child to be infected with the disease of his parents: that the one vital factor in the occurrence of tuberculosis is inheritance," he makes in the last sentence an assertion which it is a little difficult to excuse. To mention only the best known data, he will find in part ii. of each of the last two decennial supplements published by the Registrar-General ample evidence that the mortality from phthisis is five to ten times as great for persons engaged in certain occupations as for persons engaged in others; it is surely idle, with such evidence at hand, to argue that environmental factors are of no importance!

We do not wish to underrate the value of the memoir—the author deserves the thanks of all those interested in the problem for his reduction and discussion of the data—but we think it should be read with caution, as the writer appears insufficiently acquainted with the other evidence bearing on the question. In conclusion, a doubt may be raised whether the most satisfactory method of studying the influence of heredity on phthisis is to deal as a whole with a random sample of the general population. In view of the widely divergent liabilities of different occupations to phthisis, the heterogeneity of the sample may very well unduly increase the correlations observed.

SOME PAPERS ON AMERICAN ZOOLOGY.

THE mammal and bird fauna of Alaska and Yukon territory forms the subject of No. 30 of the "North American Fauna" (U.S. Department of Agriculture). The author, Mr. W. H. Osgood, gives the results of his observations, both on the nature of the country and the fauna, made during three traverses, namely, one through east central Alaska, a second through the Ogilvie Range of the Yukon, and a third along the course of the Macmillan River. The habits, mutual relationships, and range of the different species form the main subject of the biological section, new names being very few. The attention of sportsmen may be directed to certain observations connected with the habits of moose; but, so far as mammals are concerned, the chief interest in this issue is concentrated in the announcement that the pure white bighorn sheep of the Kenai Peninsula, the so-called *Ovis dalli*, passes by imperceptible gradations into the black sheep (*O. stonei*) of the Stikine Valley. For the future these northern wild sheep must be regarded as local races of the Rocky Mountain Bighorn.

Nos. 1701 and 1702 of the Proceedings of the U.S. National Museum are devoted to the description of portions of the collections obtained during the cruise of the *Albatross* in 1906. In the first of these Miss H. Richardson gives an account of the isopod crustaceans collected in the north-west Pacific. In addition to the new Holotelson—a member of the eubranchiate section distinguished by the emargination of the terminal segment of the abdomen—the author describes a very large number of new species, especially in the genus Arcturus.

Fresh-water sponges from the Philippines form the subject of the second paper (No. 1702). The collection was submitted to Dr. Annandale, of the Indian Museum, who refers some of the specimens to *Spongilla philippinensis*, a species described by himself earlier in the present year, and the rest to a new species, *S. microsclerifera*.

In No. 1703 of the same publication Mr. J. P. Moore describes a collection of polychætous annelids dredged last year off the coasts of Labrador, Newfoundland, and Nova Scotia. Most of the specimens came from Labrador, and all are referred to species already known. They serve to confirm the supposition that the Labrador polychætes would prove to belong mainly to Arctic types, with some admixture from a more southern fauna.

STEAM TURBINES.[1]

IN the first lecture it was pointed out that the first practical steam engine was Newcomen's, about the middle of the eighteenth century, and it used about 20 lb. of coal per horse-power hour. James Watt succeeded in reducing this to 5 lb. or 7 lb. of coal per horse-power hour, chiefly through the introduction of the separate condenser, and the Watt engine remained in principle without other than detail improvements until the gradual rise of steam pressure, and consequent extra expansion, caused compound, triple, and finally quadruple expansion engines to be introduced, and as a result the coal bill is now some one-fifteenth of what it was in the time of Newcomen.

It has, however, been found that with reciprocating engines there must be a steam pressure of about 7 lb. per square inch on the low-pressure piston, or otherwise its size and weight become excessive, and also that there is little or no benefit in going to a higher vacuum than about 25″.

With the steam turbine, vacua of 28½″ or 29″, or absolute pressures of from ¾ lb. to ½ lb. per square inch, can be easily utilised, since the difficulty of dealing with large

[1] Abstract of three Cantor lectures delivered before the Royal Society of Arts by Mr. Gerald Stoney, and published in the Journal of the Society for October 8, 15, and 22