

tuberculate mammals occur, however, on the upper horizons, and may still have existing representatives. H. F. Osborn discusses the "Close of Jurassic and Opening of Cretaceous Time in North America" (Bull. Geol. Soc. America, vol. xxvi., 1915, p. 295), as an introduction to a symposium on the Morrison formation. This discussion has a special application in England to the Purbeck-Wealden question.

The Wisconsin Geological and Natural History Survey has reported on the north-western area of the State (Bulletin No. 45, Madison, 1915), where very little geological work had been done prior to the official entry of Mr. W. O. Hotchkiss and his assistants in 1913. Since the area lies in the Lake Superior iron district, great stress has been laid upon a continuous magnetic survey, the principles of which are set out in chapter iv. This illustrated essay of sixty pages will be of service to mining students in general. The ores are the well-known sedimentary masses of Huronian age, and the extent of the Huronian beds beneath the glacial drift has been largely determined by magnetic readings. Bush-covered ground and rivers, as indicated in the sympathetic pictures of geologists at work, have often hindered observation, and only the most careful organisation could have carried out the survey in so comparatively short a time.

G. A. J. C.

THE ZOOLOGICAL SURVEY OF INDIA.

WITH the sanction of the Secretary of State the Government of India has recently converted the professional staff and entire working machinery of the zoological section of the Indian Museum into an autonomous Government department, under the name and style of the Zoological Survey of India.

This conversion, if it were—as to superficial view it might appear—merely a change of name, could pass without comment in a momentous time like the present; but inasmuch as it effects a long-desired and fundamental improvement in the prospects and official status of zoology in India—a country where, private enterprise in the domain of natural science being undeveloped, no branch of science that lacks independent and avowed recognition in the highest official quarters can hope to expand to its full extent—it deserves some notice.

In times not very long past the zoological section of the Indian Museum was administered by trustees, on the model of the British Museum, an arrangement ill-suited to a polity where, outside official circles, trustees with the necessary academic experience are not easy to find. One of the most unsatisfactory results of this system was that, although all ate of one salt and owned the Government as their father and mother, the zoological officers—irrespective of professional seniority or length of service—had always to be the official subordinates of their *confrères* in kindred scientific departments, who were constantly associated with the museum as trustees.

This anomaly was rectified by making the senior zoological officer eligible for the office of trustee, a resort to legal fiction which, although it placed zoology in proper official perspective, was calculated to offend tender consciences.

All such fictions are now obviated by bringing the whole zoological staff and its appurtenance into line with other scientific departments of the Government of India, and placing the senior representative of zoology on the same footing as the directors of the kindred scientific surveys—a position in which his opportunities of advocating and initiating research are much augmented and his responsibilities as an independent scientific adviser to Government are distinct and direct.

In notifying this auspicious change the Government expresses the hope that the establishment of a zoological survey will be of value to India; and when it is remembered—apart from all the economic reflections of the matter—that in territories like India more than 75 per cent. of the annual mortality is due either directly or proximately to noxious animals and animalcules, so that rural sanitation in such countries must rest in the first instance upon accurate and comprehensive zoological foundations, there seems every assurance that this hope will be justified.

Apart from these internal changes, which bring field-work from a precarious position in the rear into the very front rank of the duties of the staff, and transform the trustees from responsible guardians into authorised visitors of the collections, the zoological section of the museum as a going concern will not be altered in any way. Nor is any extra expenditure anticipated for the immediate future, since the available museum grant is ample for the intended purpose, and the collaboration of the Marine Survey Department and the close co-operation of the Forest and Agricultural Departments are assured.

Under the new régime the national zoological museum of India promises to be, like some other Indian official organisations, an institution of an exemplary kind.

GENETIC STUDIES IN PLANTS.

IN a paper on "Growth and Variation in Maize" (*Zeitschr. f. indukt. Abstammungs- und Vererbungslehre*, xiv., 1915, Nos. 3-4), Drs. Raymond Pearl and F. M. Surface combine the statistical and individual methods of inquiry. "We have tried," they write, "by studying the growth of the individual to analyse the adult variation curve into its component elements." Height is the character chosen for investigation; the relative variability as observed throughout the season "shows a marked progressive diminution," and the authors believe that the maize plant grows "in a series of cycles." In a second part of the paper they discuss the relation of variation to growth, and from the distribution of small, medium, and large plants conclude that the manner of growth is dependent on Mendelian factors.

Maize is also the subject of a paper in the *Journ. Agric. Research* (vi., No. 12) by G. N. Collins, who deals with "correlated characters" in the species. Eleven characters were selected for study, and of fifty-five possible combinations twenty were found to show significant correlations; but in all but five these appear to be physiological rather than genetic, and in no instance is the coefficient higher than 0.5. The author fears, therefore, that the method of isolating types is inapplicable to maize, though desirable characters derived from different parents may be easily combined.

The "Suppression of Characters on Crossing," illustrated by experiments on species of wheat, is discussed in a paper by R. H. Biffen (*Journ. of Genetics*, v., No. 4). He finds that dominant features, such as grey-ness of chaff or redness of grain, may be suppressed, so that "recessives make their appearance in F_2 generations from crosses of parents showing dominant characters only." This may perhaps be due to the existence of more than one factor giving rise to apparently the same dominant character, and the consequent possibility that two factors determining the recessive may meet in some of the zygotes that give rise to the F_2 generation.

Dr. T. Tammes contributes a paper to the Proceedings (xviii., No. 7) of the Kon. Akad. v. Wetensch. Amsterdam "On the Mutual Effect of Genotypic Factors." She has experimented by crossing varieties of flax differing in colour (blue or white) and breadth