

## SCIENCE IN GERMANY

(From a German Correspondent.)

SINCE Darwin first gave the signal for a complete rupture with the old tradition of the morphology of animals, Germany has zealously continued working in the new direction, trying to bring anatomical, embryological, and biological facts into causal connection with each other by the comparative method. Darwin's theory remains the basis, and it has been principally Haeckel who, in advance of all its supporters, deduced further important consequences; the antagonists of the theory have confined themselves to a purely negative criticism. At one time the whole theory with all its suppositions and deductions was rejected by them; at another, the theory of descent was accepted in principle, but the further representation of its connection with the anatomy and the development history of animals was refuted; in all cases they either returned to the old views openly or they were satisfied with simple contradiction, leaving it to the future to fill up the gaps thus produced in the theory. In a work that has lately been published, the attempt has been made to consider the whole science of the morphology of animals from a different point of view. This work is: "Die Entwicklungsgeschichte der Unke als Grundlage einer vergleichenden Morphologie der Wirbelthiere" (the History of Development of *Bombinator igneus* as the basis of a Comparative Morphology of Vertebrata), by Dr. Alexander Götte, Professor of the University of Strassburg.

From a careful examination of the individual history of the development of Vertebrata and comparative consideration of the lower types, Götte tries to determine the morphological laws for the individual species, and from this to deduce their causal connection; he thus arrives at certain general theorems which, according to his view, form the basis for a conception of the origin of new animal species, totally different from Darwin's view. On the one side Götte does not look upon the animal ovum as a cell, nor in fact as a living organism at all; this of course is different from all other theories hitherto published. According to his view the cells, which are the basis of the formation of the ovum, only produce a conglomeration of a certain material (yolk) in a certain arrangement, but are themselves dissolved sooner or later, so that the complete ovum is a peculiar body, not living, but endowed with properties that enable it to be converted into a living organism under certain conditions. He maintains that this capacity for development is not the simple consequence of the chemical composition of the yolk, but that it only contains the motive force which is freed by chemical processes, and can do very different work according to the physical conditions under which it happens to be. The result may therefore as likely be the destruction of the ovum as its further development. For the latter, perfectly certain conditions of form are necessary, which have already been initiated during the formation of the ovum, and cause the force in question to work in a direction just as determined and certain as they are themselves. The results in that case are self-divisions of the yolk, when the parts are either of equal or of different sizes, and produced at different intervals. The former separate very soon and form separate individuals, which therefore consist only of one element and represent the lowest type (Protozoa); the ova of Matazoa, which are unequally divided according to a certain law, remain whole. Their coarser formation is brought about in a purely mechanical way, each division causing a displacement.

Thus Dr. Götte finds the basis of the fundamental structure, the type of each animal species, in the differences originating through the laws regulating the first divisions of the yolk.

## NOTES

AN Exhibition of 50*l.* a year, tenable for four years, was recently devoted by the Endowed Schools Commission for annual competition between the four schools of Taunton, Tiverton, Exeter, and Sherborne. The details of the competition were left entirely to local trustees, whose names we do not know, but whom we understand to be gentlemen of the county of Somerset. The regulations issued by the trustees are before us. They very properly order that the examination shall be conducted by the Oxford and Cambridge Schools Examination Board. The subjects proposed by that Board include four groups, of which Science is one, and all candidates, whether choosing to take up Science or not, are permitted, if they please, to substitute Botany for Latin Verse, and Physical Geography for Greek Prose Composition. The scheme of the Somersetshire trustees includes all the subjects named by the Universities *except those which come under the head of Science*, refusing to permit any branch of science to form part of the examination, whether as an independent topic or as an alternative. We content ourselves for the present with the statement of a fact likely to interest all our readers, those more especially who are aware of the efforts that have been made during the past six years to establish in the county of Somerset a centre of first-rate scientific teaching.

AMONG the additional estimates recently voted by the House of Commons is one for the salary of an Assistant-Director to the Royal Gardens at Kew. Everyone will be rejoiced to hear that the arduous duties of the Director are likely to be lightened by this appointment, which has been filled up by the selection of Prof. Thiselton Dyer.

IN connection with the Commission appointed by the President of the United States to experiment and report upon the metals used in construction (NATURE, vol. xii. p. 94), Mr. R. H. Thurston, the Secretary, has issued circulars expressing his desire to secure the assistance of all who are interested in this great work, and through them to obtain all information available as the result of the labours of earlier or of contemporaneous investigators and observers. The circulars indicate the scope of the labours undertaken by this Commission, and request aid from all in a position to render it, in the collection of all information which may be accessible, relating to either the general work of the Commission or to the special subjects assigned to its committees. Data collected in the course of ordinary business practice, and the records of special researches previously made or now in progress, are particularly desired. It is expected that the Commission will receive valuable information and useful suggestions, both from business men and from men of science, and it is hoped that the work undertaken by the Commission may be supplemented by original investigations made by both these classes. The great importance of this work justifies the expectation of an earnest and effective co-operation. Part of the work of the Commission is the investigation of the methods and effects of Abrasion and Wear of metals in engineering and mechanical operations. Valuable data for the purpose could be furnished by railway engineers and others in regard to the wear of rails, wheels, axles, journals under heavy loads or at high velocities, the wear of tools, and other points, and we hope that all in this country who have it in their power will lend what aid they can to this important Commission. Another part of the Commission's work is a series of determinations of the effects of carbon, phosphorus, silica, manganese, and other elements, upon the strength, toughness, elasticity, and other qualities of iron and steel. Mr. A. L. Holley, Chairman of the Committee on Chemical Research, issues a circular giving detailed instructions as to the specimens and kind of information wanted. We should advise all interested to apply to Mr. R. H. Thurston, Stevens Institute of Technology, Hoboken, N.J., for detailed information; and we think the