

Nov. 21, 1872]

145

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## OUR BOOK SHELF

*Palaontographica. Beiträge zur Naturgeschichte der Vorwelt*, herausgegeben von Dr. W. Dunker and Dr. K. A. Zittel. Band XX. Lief. 5. September 1872. (London: Williams and Norgate.)

THIS part of the "*Palaontographica*" contains a continuation of Dr. Geinitz's description of the fossils of the Lower Quader Sandstone of the Valley of the Elbe in Saxony, and includes an account of the Brachiopoda and the early families (Hippuritidæ, Ostracidæ, Spondylidæ, and Pectinidæ) of the Pelecypoda. The species are carefully described and beautifully figured, and the synonymy and distribution of them are discussed at some length, so that the work must be regarded as indispensable for the student of the Cretaceous rocks.

In some general remarks prefixed to his descriptions Dr. Geinitz calls attention to the interest attaching to these Saxon fossils, in some cases owing to their wide geographical range, in others to their long range in time during the Cretaceous period. Thus of the species here noticed, *Ostrea carinata*, *diluviana*, and *hippopodium*, *Exogyra lateralis*, *columba*, and *haliotoidea*, *Pecten membranaceus*, and *curvatus*, *Vola phaseola*, *quinquecostata*, and *quadricostata*, and *Lima tecta*, are common to the Cretaceous rocks of the Elbe Valley in Saxony and of Southern India, in both which localities the lower members of the Cretaceous series (Neocomian and Gault) are wanting. *Inoceramus labiatus* and *Ammonites peramplus* are also referred to as fossils common to the two localities. On the other hand a collection of Cretaceous fossils from the neighbourhood of Colorado city and the north of New Mexico also included examples of *Inoceramus labiatus*, *Ammonites peramplus*, *Baculites baculoides*, *Inoceramus Brongniarti*, and a species resembling *I. striatus*, evidently representing the Middle Planer of the Elbe Valley, and derived from similar beds of Chalk-marl, over which lie beds with *Inoc. Goldfussianus*, *Baculites*, and *Scaphites*, evidently belonging to the age of the White Chalk. These facts, as Dr. Geinitz remarks, furnish support to the assumption of migrations of species from India to Europe, or from Europe to America, long before the human race took the same road.

The most interesting cases of the long-continued existence of species are those relating to the occurrence thus low down in the Cretaceous series of species common to these deposits and to the latest beds of this formation in the province of Schonen in Sweden. Dr. Geinitz also calls attention to the variations occurring in the species here noticed, and to the apparent interdependence of many of those in older and newer parts of the formation, so that, as he says, "it is not difficult to sketch a regular genealogical tree for various series."

*Theoretische Maschinenlehre.* Von Dr. F. Grasshof. I-

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*Theoretische Maschinenlehre. Von Dr. F. Grashof. In vier Banden. Erster Band. Erste Lieferung.* (London: Williams and Norgate.)

THE first number of this work has been issued during the present year. From the preface we learn that the object of the work is the theoretical investigation of the problems involved in the theory of machinery. In the first volume will be discussed the mechanical theory of heat, the theory of hydraulics, and certain other parts of theoretical physics and of applied mechanics, which will be useful in the subsequent portions. The second volume will contain the elements of machines, of mechanical movements, and of governors, and also of mechanical instruments—*i.e.*, instruments for measuring time, velocity, mass, force, and energy.

The third volume discusses the machines which serve for the application of natural agents to technical purposes, machines for employing the power of animals, hydraulic wheels, windmills, steam engines, and especially heat engines in the widest sense. Finally, the fourth volume will be occupied with machines for doing work (*Arbeit-*

*maschinen*)—that is, machines for moving about and hoisting solid, liquid, and gaseous bodies (locomotives, screw-propellers, winding machines, rams, pumps, blowing machines), also machines for the working and manipulation of rigid bodies, such as hammering and rolling machines, sawing machines, &c.

The number which lies before us principally discusses the mechanical theory of heat. This subject is entered into with great thoroughness and profundity, and includes an elaborate discussion upon radiant heat and many other collateral matters. It need hardly be added that for the perusal of this work a sound knowledge of mathematics is indispensable.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

## Kew Gardens and the National Herbarium

PROF. OWEN has very imperfectly stated the facts respecting the cultivation of the ipecacuanha plant at Kew and in India.

My friend Mr. McNab says of the ipecacuanha (Trans. Bot. Soc., vol. x. 319): "It is a plant of remarkably slow growth; the largest plant in the Botanic Garden at Edinburgh is scarcely one foot in height, although more than thirty years of age, and has three leading shoots, each four inches in length. The method hitherto adopted of propagating the *Cephaelis* (as far as I am aware) is by cuttings, but of these not more than one or two can be got at a time, and at long intervals."

It was the possession in the Edinburgh Botanic Garden of old long-established plants, with well-developed, rhizome-like rootlets, and the difficulty experienced there in obtaining cuttings, which suggested to Mr. McNab a method of propagation which has since been found exceedingly successful, and for which he deserves every possible credit. In a printed report to the Secretary of State for India (11695) Dr. Anderson states: "It was when examining the old plants in order that the best method of propagating might be determined on, that it occurred to Mr. McNab that the numerous root-like tubers might be taken advantage of as a means of rapidly increasing the plant."

At Kew no such great difficulty has been experienced in increasing the ipecacuanha by ordinary cuttings, the original specimen having during the last six years been by this means increased manifold. On the other hand, the constant demand for cuttings from the Kew plant has prevented the formation of the tuberous rhizomes which in the case of the Edinburgh one were the result of thirty years' growth.

As far as the resources of Kew Gardens would allow, all three presidencies of India were supplied with ipecacuanha plants, not once only, but at various times. Most of these perished in India, some from being planted in unsuitable sites, others from accident; and it was not till 1868 that its cultivation promised success, upon which its propagation on an extensive scale was ordered by the Government of India.

Of the plants sent to Calcutta from Kew, one which arrived in 1866 had in 1869 produced twenty plants (Anderson, *l.c.* p. 3); of these twelve were sent to Sikkim, where seven were "killed by a coolie falling on them and completely smashing them" (Report of the Calcutta Botanic Garden, April 25, 1871). The further history of the remainder is detailed in Dr. King's report, which is quoted by Prof. Owen, but in a very unfair manner. The passage which he has extracted proceeds as follows beyond the point where he stops: "The five plants in Sikkim were, early in the current year, submitted by Messrs. Gammie, Bierman, and Jaffrey, of the Cinchona plantations, to a most successful experiment in artificial propagation, by which four hundred cuttings were obtained, the greater proportion of which have formed good roots, and are now fine healthy little plants."