may be applied. This needle is practically the only instrument used in the profession.

The height of civilisation in China was reached at the end of the reign of Kang-hi. The gradual decline is supposed to have commenced with the Tartar domination.

THE FLORA OF THE GALAPAGOS ISLANDS.

DR. G. BAUR'S theory of the origin of the Galapagos Islands is too well known to need explanation here; yet it may be briefly designated the theory of subsidence. He argues that the islands were formerly connected with each other, and at an earlier period with the American continent. It is also almost needless to say that this theory has met with an exceedingly hostile reception ; few indeed accepting it, even as restricted to a former union of the islands themselves. The publication of an account of the botanical collections[1] affords an opportunity of examining this theory from a botanical standpoint. For the purposes of the "Botany" of the *Challenger* Expedition, and ever since the publication of that work, I have collected all the data coming under my notice bearing on the dispersal of plants to considerable distances by wind, water, birds or other creatures excepting human. The evidence thus collected sufficiently accounts for the vegetation of low coral islands, and the littoral vegetation of widely separated countries ; but it in no way helps to explain the vegetation of the enormously distant islands of the Antarctic seas, for example, or that of the islands of the Galapagos group, to give another instance.

But these are not parallel cases ; they are the two extremes in the amount of differentiation in connection with isolation.

The biological phenomena of the Galapagos Islands left a deeper impression, probably, on the mind of Darwin than those of any other part of the world he visited, and doubtless had much to do with his later conception of the origin of species. The fact on which he laid special stress was that the genera, to a very great extent, were the same in all the islands, and the species different in each island. Dr. Baur's much more extensive zoological and botanical collections and observations confirm and emphasise the correctness of the view of his illustrious predecessor of fifty years ago. Darwin specially refers to the existence of different species or races of tortoises and mocking-thrushes in many of the islands ; and Baur's examination of the lizards of the genus *Tropidurus*, from twelve of the islands, reveals the same condition of things. The botanists bring forward *Euphorbia viminea* in illustration of this phenomenon. This species was described by Sir Joseph Hooker from a single specimen collected by Macrae in Albemarle Island, and the author remarks that he "knew of no species with which to compare this highly curious one." Dr. Baur collected it extensively in eight of the islands, and the specimens from almost every one of them exhibit distinct racial characteristics. *Acalypha*, a genus of the same natural order, presents somewhat more pronounced variation in the different islands, which some botanists regard as of specific value ; other botanists as of varietal value only. Whatever status we give these forms, the flora as a whole is a most instructive and convincing illustration of evolution.

A remarkable peculiarity of the Galapagos flora, as an insular flora, is the almost total absence of endemic genera, for the two or three genera of the Compositæ restricted to the islands are so closely allied to American genera as hardly to count as distinct. Indeed the whole flora is so thoroughly American that, apart from geological difficulties, it might be regarded as a differentiated remnant thereof, rather than derived therefrom, after the supposed elevation of the islands. Analogous conditions and phenomena are repeated in the deep valleys of the great mountain chains of northern India and western China, where, in neighbouring valleys, the genera are to a great extent the same and the species different.

Returning to Dr. Baur's extensive botanical collections from the Galapagos, it may be mentioned that they yielded about a dozen new species belonging to the predominating genera.

Looking at the composition of the Galapagos flora, especially with an eye to the probabilities of the transport of the seeds of its constituents, combined with present conditions, Dr. Baur's theory seems deserving of more serious consideration than it has hitherto received. My very slender knowledge of geology alone prevents me from taking up a more decided position.

W. BOTTING HEMSLEY.

[1] B. L. Robinson and J. M. Greenman, in *American Journal of Science*, vol. l. pp. 135-149.

N.B.—Dr. G. Baur was attached to the United States Fish Commission steamer *Albatross*, and spent nearly three months in the islands, from June 10 to September 6, 1891.

THE LATE PROFESSOR HOPPE-SEYLER.[1]

II.

Hoppe-Seyler's Work in Berlin, 1850-54 *and* 1856-61.

IT has already been stated that Hoppe selected as the subject of his inaugural dissertation some observations on the structure of cartilage and on chondrin.[2] Chondrin had been first separated and examined by Johannes Müller,[3] and afterwards by Mulder and Donders. Pursuing his study of the chemical reactions of the so-called chondrin, Hoppe in 1852[4] described its lævorotatory property, and showed that when decomposed by long boiling with dilute mineral acids it yields leucine, but neither glycocine nor tyrosine. Still directing his attention to the connective tissues, Hoppe in the following year published a valuable and interesting paper[5] on the structural elements of cartilage, bone, and tooth. Virchow had shown[6] the possibility of isolating the so-called bone corpuscles. Hoppe now alleged facts which seemed to prove that the lacunæ and canaliculi of bone are lined by a tissue resembling elastic tissue, and are left surrounding the bone cells when decalcified bone is boiled in a Papin's digester. Extending his investigation to tooth, Hoppe studied the chemistry of the organic basis of dentine, and isolated the "dentinal sheaths," which he showed to correspond structurally and chemically to the more internal portion of the ground substance of bone, which may be separated as a distinct investment bordering the lacunæ, canaliculi, and Haversian canals. There can be no question of the important bearing which these early histologic-chemical researches had upon the development of our knowledge of the relations and affinities of the connective tissues; attention has been drawn to them for this reason, as well as because they differed somewhat in their scope and method from the work with which Hoppe afterwards mainly busied himself.

Passing over three interesting papers on auscultation[7] and communications of minor importance on chemical

[1] In the fragmentary notes which follow, I do not pretend to give a complete or entirely consecutive account of Hoppe-Seyler's labours ; my object is to draw attention to some of the principal results of his life-work, and to indicate in this way his position among those who, during the last half-century, have contributed to the advancement of biological science.—A. G.

[2] F. Hoppe, "De Cartilaginum Structura et Chondrino nonnulla," Diss. Inaug. Berol. 1850.

[3] Joh. Müller, *Poggendorff's Annalen*, vol. xxxviii. (1836) pp. 295-356.

[4] Hoppe "Ueber das Chondrin und einige seiner Zersitzungsproducte," *Journ. f. Prakt. Chemie*, vol. lvi. (1852) p. 129.

[5] Hoppe, "Ueber die Gewebselemente der Knorpel Knochen und Zähne,' Virchow's *Archiv*, vol. v. (1853) p. 170.

[6] Virchow, "Verhandl. d. Phys. Med. Gesellschaft zu Würzburg," vol. ii. p. 152.

[7] Virchow's *Archiv*, vol. vi. (1854) pp. 143-173, vol. vi. (1854) pp. 331-349, vol. viii. (1855) pp. 250-259.