THE GEOLOGICAL MAGAZINE.

NEW SERIES. DECADE II. VOL. VIII.

No. VII.—JULY, 1881.

ORIGINAL ARTICLES.

I.—NOTE IN EXPLANATION OF PLATE VII., TO ILLUSTRATE THE THEORY OF SUBSIDENCE AND ELEVATION OF LAND, AND THE PERMANENCE OF OCEANS.¹

By J. S. GARDNER, F.G.S.

FIG. 1 is intended to represent a section across an ocean basin. It is supposed that the combined weight of water (1) and sediment (2), acting upon an elastic layer of rock (3), compresses the fluid layer which underlies it (4), and forces it to escape laterally, and either to accumulate and partially solidify, thus raising the crust above; or, where the tension is extreme, and the resistance inadequate, to form fissures or vents. The continuously sustained pressure towards the centre of the basin constantly converts fresh solid into fluid, which escapes again and again, perhaps at intervals of centuries, causing fresh upheavals or eruptions, perpetually deepening the ocean basin.

The relative mass of sediment to crystalline rock may be enormously greater, since its accumulation must have been increasing from the remotest ages.

FIG. 2 represents the basin of the Pacific with its encircling chain of volcanos, and is after Scrope.

FIG. 3 is an ideal section similar to that of Fig. 1; but showing in addition sub-marine lines of insufficient resistance.

In the article, reference to one of the most striking examples of subsidence being directly due to weight of sediment was omitted.

The constant influx of brackish water seen in our coal-fields, and the nature of coal, show beyond doubt that it was deposited at or about the sea-level, yet in the South Wales district the Coal-measures are 10,000 to 12,000 feet thick, with 75 distinct seams.

II.—ON THE GENERA *MERISTA*, SUESS, 1851, AND *DAYIA*, DAV. 1881.

By THOMAS DAVIDSON, F.R.S., etc., etc.

IN his memoir "Brachiop. der Kössener Schichten," p. 17, Prof. E. Suess proposed his genus *Merista*, giving as its type the *M. Herculea*, Barrande, and at page 85 of the German edition of the general introduction to my work on British Fossil Brachiopoda Prof. E. Suess redescribes his genus, and in pl. iii. figures its spirals and shoe-lifter process; but neither the connexions of the spirals, nor their attachments to the hinge-plate, had then been discovered. Prof. Suess also includes in his genus *Merista* the so-called *Atrypa tumida*, Dalman (now the type of our genus *Whitfieldia*), whose

¹ This Plate should have accompanied Mr. Gardner's article which appeared in the June Number, see pp. 241-245.—EDIT. GEOL. MAG.

Fig. 1.

Fig. 2

Fig. 3.

Fig. 1. Ideal Section across Ocean Basin.

1. Sea. 2. Accumulated sediment. 3. Solid rock, converted at 4. to fluid by pressure. 5. Solid central mass

Fig. 2. The Pacific basin, showing encircling volcanos, from Scripps Institution of Oceanography, University of California, San Diego, 1961. The map is available from <https://www.cambridge.org/core>. Newcastle University, on 20 Jul 2017 at 09:01:21, subject to the Cambridge Core terms of use, available at <https://www.cambridge.org/core/terms>. <https://doi.org/10.1017/9781009175561.001>

Downloaded from <https://www.cambridge.org/core>. Newcastle University, on 20 Jul 2017 at 09:01:21, subject to the Cambridge Core terms of use, available at <https://www.cambridge.org/core/terms>.
<https://doi.org/10.1017/S00075507160005261>

<https://doi.org/10.1017/S0016756800117261>