

AN AUSTRALIAN SAUROPTERYGIAN (*CIMOLIO-  
SAURUS*), CONVERTED INTO PRECIOUS OPAL.

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(Plates v., vi., vii.)

I WAS recently favoured by Messrs. Tweedie and Wollaston, Merchants, of Adelaide, through the good offices of Mr. H. Y. L. Brown, Government Geologist for South Australia, with a large quantity of opalised material from White Cliffs, representing the broken-up skeleton of a Plesiosaur, but unfortunately wanting the skull. There are numerous vertebræ in various states of completeness, innumerable portions of ribs, a few teeth, phalanges, and other bones that will be subsequently referred to. These have now become the property of the Trustees of the Australian Museum.

I.—PRECIOUS OPAL AS AN AGENT OF REPLACEMENT.

The replacement of the calcareous matter in fossils by Precious Opal appears to be a fact but little commented on by Authors.

The search for opal in the Upper Cretaceous at the White Cliffs Opal-field on Momba Holding, about sixty-five miles north-north-west of Wilcannia, in Co. Yungnulgra, has been signalised by the discovery of many beautiful examples of the entire conversion of the shelly envelopes of Pelecypoda and Gasteropoda, the internal shells of Belemnites, and Reptilian remains, into Precious Opal by a process of replacement.

Many of these are in the Collection of the Geological Survey of N.S. Wales, others have been lent to the same, and through the courtesy of Mr. E. F. Pittman, Government Geologist, I have been permitted to examine them.

The process of "silicification," as it is called, or the replacement of matter in fossil organic remains, by silica, in one or other of its varieties, is too well-known to require more than the briefest notice.

Silicification is said to be *primary* when organisms have undergone a slow process of alteration in water holding silica in solution, each particle of tissue, as it decayed, being replaced by the mineral in question, the minute structure of the body thus acted on being so preserved. "By far the commonest mode of replacement is that whereby an originally calcareous skeleton is replaced by silica. This process of 'silicification'—of the replacement of *lime* by *silica*—is not only an extremely common one,