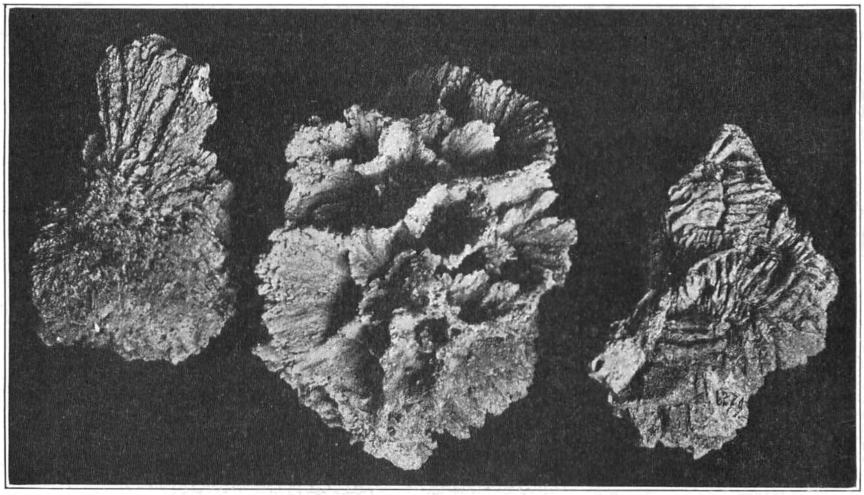
ART. XIII.—*Some Interesting Chalcedony Pseudomorphs from Big Badlands, South Dakota;* by ARTHUR P. HONESS.

The writer's attention was recently called to some very interesting chalcedony rosette pseudomorphs obtained by Dr. William J. Sinclair from the Lower Oreodon and Titanotherium Beds, Big Badlands, Pennington County, South Dakota, during the field operations of the Princeton University Expedition in the summer of 1922.

The chalcedony pseudomorphs occur in a color banded clay of Oligocene age, and represent what appears to be a complete replacement of gypsum rosettes by a light bluish-gray chalcedony. They are rather unique in that they reveal silicification of a quite unusual crystal grouping, varying from nodular rosettes three centimeters in diameter to beautiful cup clusters ten centimeters or more across (see fig. 1). The rosettes, for the most part, are composed of tabular crystals some of which reveal cruciform twins, others exhibit a multiple contact relation and all are, more or less, radially arranged. Certain portions of one of the smaller specimens show very distinctly the curved fibrous crystals so characteristic of satin spar gypsum, but this is exceptional to the habit of the pseudomorphs in general and need not be mentioned here except that it strengthens the view concerning the original substance. The individual crystals composing the rosettes vary in size from five millimeters in the smaller pseudomorphs to three centimeters in the larger ones. The usual crystal form is elongated and blade-like with the crystal habit fairly well preserved. The edges have been rounded and the crystal surface roughened by a thin botryoidal film of chalcedony, the result of subsequent silica deposition. Certain of the chalcedony pseudomorphs contain colorless, transparent calcite at the center or enveloping individual crystals, which also represents a later infiltration of carbonate solution and is not related genetically to the chalcedony.

Small amounts of clayey substance, taken from the interior of broken pseudomorphs and from samples of the clay formation enclosing them, yield a qualitative test for a soluble sulfate; aside from this there is but little chemical evidence to support the view that the original mineral was gypsum, but the peculiar grouping and general shape of the crystals, together with the occurrence, readily suggest some of the more common sulfates, a study of the crystal forms of which, and comparison with various sulfate minerals from the Princeton University collection, point to gypsum as the probable mineral replaced. And, while the evidence at hand is not entirely conclusive, the blade-like habit and sloping termination of the larger individuals, the fibrous bent character of certain smaller crystals and the close agreement in crystal angle of both simple and twin crystals, leave little doubt in the mind of the writer as to the nature of the original substance.



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