Small amounts of azurite and cuprite have been found, along with occasional particles of native copper.

The ore occurs in unaltered grey or nearly white arkose sandstone in greater part adjacent to dikes and intrusive sheets of trap although no dikes or sheets of this rock appear at the surface. There are two layers of this arkose sandstone, the lower one about ten feet thick and the upper one about twelve feet separated by about one foot of shale. The copper ores have originated from hot copper solutions, probably of magmatic origin, deriving both their heat and their copper salts from the underlying Palisades trap sill and its offshoots. "The deposition of chalcocite," says Prof. Volney Lewis,[6] by the heated waters near the intrusive, and of native copper with minor amounts of glance in the more remote, cooler regions, has in both cases doubtless been chiefly the result of cooling, supplemented perhaps in part by reactions with the calcite of the shales. The conditions of considerable accumulation have been supplied by some relatively impervious member, a dense shale or a trap sheet, which has sufficiently impeded the movements of the uprising solutions to permit considerable cooling, and, therefore, extensive deposits, and also to allow time for any possible reactions with the calcite and for leaching out the ferric iron, in part, by the acid waters."

AN UNUSUAL DIAMOND CRYSTAL

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A short time ago Professor H. F. Cleland, of Williams College, sent to the Mineralogical laboratory a portion of a diamond crystal which proved to be of considerable interest. The specimen was hollow, and it was desired to determine whether or not the cavity had originally contained another diamond. Not only was this cavity unusual, but in addition two faces were found which represent a new form for the diamond.

The portion submitted for examination had been sawed from a larger stone, concerning which no information is available. As shown by the drawing (Fig. 1), this portion consisted of one half of an octahedron, and was about 5 mm. across. The octahedron was the predominant form, together with a well developed hexoctahedron (541), and in addition there were two small hexoctahedron faces which gave the indices (975), and which are desig-

[6] Copper deposits of the New Jersey Triassic, *Econ. Geology*, **2**, p. 257.

nated by the letter *H* in the drawing. These latter faces were sharply defined, and gave fair signals on the goniometer, with the following results:

Symbol	Measured angles		Calculated angles	
	ϕ	ρ	ϕ	ρ
957	60°50′	55°11′	60°57′	55°47′
975	51°35′	66°27′	52°07′	66°20′

The cavity, as shown in the diagram (Fig. 2), occupied the whole interior of the crystal, and its sides were parallel to the octahedron faces. The edges were sharp, and except for some triangular markings, the walls were smooth and gave definite single reflections. Judging from the evidence available, it seems highly probable that this cavity originally contained another diamond.

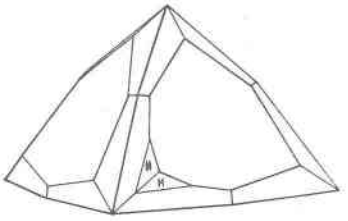

Figure 1.
Diamond Showing New Form (975)

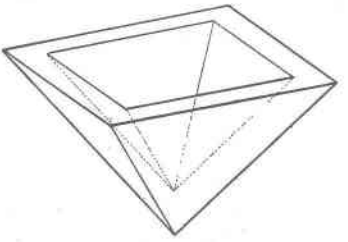

Figure 2
Diamond with Octahedral Depression

A cavity caused by solution would tend to be irregular, with rounded edges, and would necessarily be at the surface and not at the center of the crystal. Likewise in the case of a cavity formed by skeletal growth, we would expect a compact center, with depressions or cavities on the faces.

Cavities formed by foreign inclusions, such as carbonaceous or chloritic material, hematite, and liquid CO_2 are not uncommon, but it is hardly conceivable that any of these could produce such a regular depression as this one under consideration.

Inclusions of extremely small diamonds have been observed, and in at least one case the occurrence of a good sized crystal has been definitely reported.[1] Such an explanation seems in accord with the evidence available, and is the one which was given in the report. In view of the uncertainty concerning the origin of the diamond, it seems useless to conjecture as to how such a type of crystal might have been formed.

[1] G. S. Williams, Diamond Mines of South Africa.