

## NOTES AND NEWS

### GLAUBERITE CRYSTALS FROM WEST PATERSON, NEW JERSEY

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Within recent years much interest has been shown in the negative crystal cavities found in prehnite and other minerals at West Paterson. These cavities represent crystals of a number of different species, most of which are easily soluble in water, such as calcite, anhydrite, and glauberite.<sup>1</sup>

In 1932, Mr. John Obert discovered free glauberite crystals in the West Paterson quarry. The largest of these crystals is  $2 \times 3$  cm. in size, though most of them are smaller. Their color is light gray, with a white exterior powdery coating caused by alteration, which is mostly calcium sulphate. The crystal forms shown are the base  $c$  and the minus unit pyramid  $s$  (see Fig. 1). A number of the crystals are elongated parallel to the  $a$  axis. Many are grouped in irregular aggregates.

With the glauberite crystals there are also small crystals of gypsum, the largest of which measures  $1 \times 2$  cm. Most of them have a light brown color due to occluded dirt. The crystal forms shown are: unit prism  $m$ , clinopinacoid  $b$ , and unit minus pyramid  $l$ . Con-

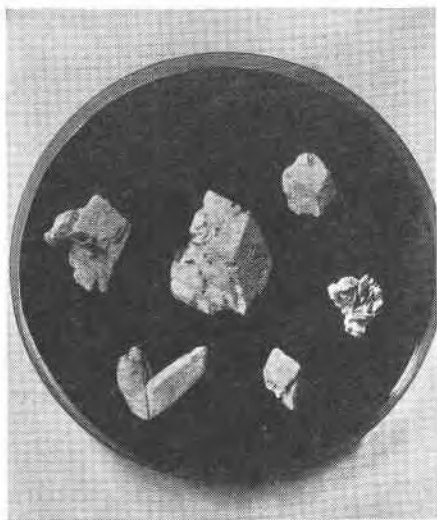


FIG. 1

tact twins on *a*, the common swallow-tail type, are present among them. A few crystals are flattened parallel to pyramid *l*, others parallel to the pinacoid *b*. Aggregates, irregularly intergrown, are numerous.

The crystals of glauberite and of gypsum occurred together and were lying loose in a cavity roughly 1×1 meter in size, which was in the solid basalt, about 2 meters below the top of the quarry wall. There was a quantity of brown dirt with the crystals in the cavity which had evidently been derived from the decomposition of the basalt.

At West Paterson there are, besides the original minerals which were developed at the time of the Triassic lava flow, a number of other minerals which have been formed, redissolved and formed again in new combinations by the circulation of underground water during the long period since the igneous activity occurred. Hence, pseudomorphs and replacements are often observed, as well as abundant negative crystal cavities which occur in a number of different minerals. If all of the mineral combinations of the West Paterson locality were fully known, it would undoubtedly be found that practically every mineral present exists in nearly every possible relation to every other mineral of the locality. Thus glauberite and gypsum crystals have been formed and redissolved a great many times, either to reappear in different mineral combinations, or simply to be formed again.

It is the writer's conviction that the crystals of glauberite and gypsum, which are here described, have been formed at some quite recent time, probably from water standing in the cavity during the glacial period (Pleistocene), when this hill of basalt was completely covered by slowly moving ice, and the level of the underground water was so high that the cavity was, for a considerable period, full of water. Since the melting of the glacial ice the cavity has become dry, but the crystals have remained to the present day.

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#### TWISTED MILLERITE CRYSTALS

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In the anthracite coal basin at Nanticoke, Pa., the Mills coal vein is cut by narrow stringers of white quartz. In cavities which are present in this quartz, occasional aggregates of millerite crystals