MARCASITE FROM THE RACINE DOLOMITE, RACINE, WIS.

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The expedition to the northern peninsula of Michigan from the geological museum of the university in 1923 brought back a number of specimens of marcasite from the Racine dolomite. The material was found in the quarry of the Consumers Co., about three miles north of Racine, Wisconsin.

The crystals are described by G. M. Ehlers, by whom the specimens were collected, as occurring in cavities in the dolomite. The cavities range up to a foot or more in diameter and are irregularly distributed throughout the quarry.

The material shows a wide variety in the crystal development and the measurement of some of the crystals for the purpose of identification suggested that further examination of the material might be desirable. A survey of the literature showed that for such a common mineral a surprisingly small amount of work had been done on it. This is probably due not only to the fact that, being so common, the natural assumption would be that its possibilities for investigation had been exhausted, but also to the fact that its tendency to form twins, trillings, etc. is so great that it is somewhat difficult to obtain material which can be measured.

The material under discussion shows a wide variety in its habit; occurring as simple and complex crystals, and also in radiating globular, cockscomb, and spearlike masses. The individual crystals vary from very thin tabular crystals parallel to the basal pinacoid to thick stocky crystals. The tabular crystals generally show striations on the brachydomes parallel to the edge between the basal and brachypinacoids. The thick crystals, however, do not show the striations but a pronounced etching which gives them the appearance of having been built up of layers on the brachydome which have tended to cleave off. The material is all tarnished, the color varying decidedly in different specimens from a whitish yellow, through a lemon yellow to a dark brown. Some specimens show a tarnish so similar to that commonly observed on chalcopyrite that the presence of copper was suspected. Nevertheless tests failed to reveal its presence. The color of the untarnished material is tin white and not pale bronze yellow as stated by Dana.

Marcasite crystallizes in the orthorhombic system and the following forms were observed: pinacoids $c\{001\}$, $b\{010\}$; prism $m\{110\}$; macrodome $e\{101\}$; brachydomes $l\{011\}$, $z\{012\}$, $r\{014\}$, $w\{027\}$ (new), $x\{029\}$ (new); and pyramid $s\{111\}$. The previously reported forms not observed are: $a\{100\}$, $v\{013\}$, and $y\{025\}$. The two new forms $w\{027\}$ and $x\{029\}$ may be considered as definitely established since the agreement between the calculated and observed angles is very close.

	Observed	Calculated
$w : w' = (027) : (02\bar{7}) =$	38° 46′	38° 51′
$c : x = (001) : (029) =$	15° 13′	15° 20′

The crystals show three definite habits of growth: (1) A thin tabular habit in which the predominating form is one of the brachydomes $r\{014\}$, $w\{027\}$, or $x\{029\}$. When this habit is assumed the other forms in the combination are the unit pyramid and the unit-, macro- and brachydomes, the two latter forms occurring as very thin edges. Less commonly the basal and brachypinacoids are present. (2) This habit is intermediate between (1) and (3) and is characterized by an almost equal development of the brachydomes $r\{014\}$ and $l\{011\}$. The unit prism and unit pyramid are practically always present. Occasionally the unit macrodome is present but no pinacoids were observed. (3) In this type of development the unit brachydome $l\{011\}$ is the predominating form. The crystals are always twinned so that no other form except the unit prism was definitely determined. The pyramids which are present have rounded faces so that it is impossible to measure them. This type of development also shows a strong tendency to parallel growth.

The goniometric measurements upon which the forms listed above are based are as follows:

	Observed*	Calculated
$m : m''' = (110) : (1\bar{1}0)$	74° 47′	74° 55′
$l : l' = (011) : (0\bar{1}1)$	101° 23′	101° 58′
$z : z' = (012) : (0\bar{1}2)$	63° 5′	63° 21′
$w : w' = (027) : (02\bar{7})$	38° 46′	38° 51′
$r : r' = (014) : (0\bar{1}4)$	34° 19′	34° 18′
$c : x = (001) : (029)$	15° 13′	15° 20′
$e : e' = (101) : (\bar{1}01)$	115° 35′	116° 20′
$s : s' = (111) : (\bar{1}11)$	66° 34′	66° 7′

* With the exception of the values for the new forms $w(027)$ and $x(029)$, the values are those given by Dana.