SCIENCE

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A REMARKABLE OCCURRENCE OF SELENITE.

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THE writer is pleased to report a deposit of selenite in southern Utah, which is remarkable for the size, perfection, and variety of the crystals there to be found. It is situated in the newly-created

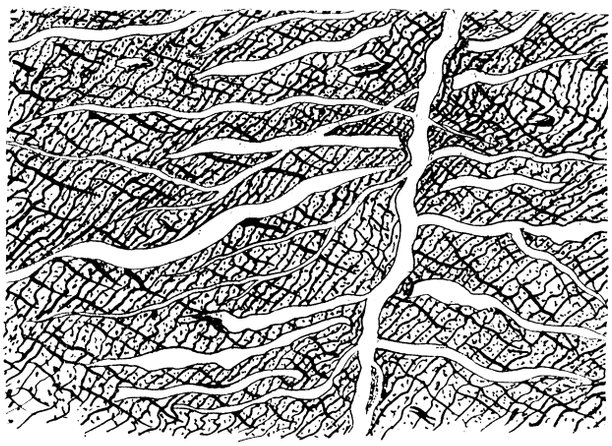

FIG. 1.

county of Wayne, in what is locally known as the South Wash, which is connected with the canyon of the Fremont River, and this in turn is tributary to the Colorado.

The formation in the neighborhood of the deposit in question is mostly sandstone and argillite, with a top dressing of erratic boulders of lava. Innumerable fantastic forms in stone declare the cutting power of water and wind; indeed, the entire region has been the site of wonderful eroding action. Ripple marks in great distinctness are frequent in the sandstone of this region and other evidences of lake formation are common.

The most convenient way to reach the deposit from the north is by way of either the Grand Wash or the Capitol Wash, spurs of the Fremont Canyon, both of which abound in scenes which are terribly grand. As one leaves the deep canyons, however, and enters the side washes, the scenery assumes a milder, though a scarcely less diversified, character.

Here and there along the gorges are outcroppings of gypsum, varying in degrees of purity; and seams of this material cut through the country rock in all directions. In places, veins of satin spar, as thin as a sheet of note-paper, or even an inch in thickness, can be traced for many hundreds of yards upon the surface of the ground in uninterrupted course, except for intersecting planes of the same material. On the walls of the ravines and canyons places are seen where spar veins cross and recross each other with bewildering profusion. Here (Fig. 1) is a sketch of such seams in an exposed face eight by twelve feet on the steep side of a ravine.

Gypsum in all varieties may be found within a short radius, fibrous and scaly laminæ, plaster-stone or rock-gypsum in masses, lumps of pure alabaster, and fragments of selenite crystals are scattered along the washes and strewn upon the bench-lands, as they have been left by the fierce floods which tore them loose from the place of formation. These occurrences form an encouraging introduction to the superb deposit of crystals already mentioned.

The crystals occur in a cave, and this is inclosed by a thick shell forming a mound which stands in relief on the side of a hill bounding the Wash. Of this formation, a good idea may be gained from Fig. 2, which is reproduced from a photograph. The mound is somewhat of an egg-shape, 35 feet in length east and west, 10 feet in breadth, and of an average height of 20 feet from the ground on the lower side; all outside measurements. This selenite mass seems to have been left exposed by the weathering of the loosened friable sand and clay, of which the hill whereon the mound is situated is composed. The mound consists entirely of selenite, the outside having a somewhat battered and roughened appearance from the action of the wind-driven sand; yet the whole exterior is made up of the exposed ends and sides of crystals, and in the sunlight the formation glistens with indescribable beauty. The outer walls are generally regular, though there are a few depressions and sheltered niches, within which small prisms of selenite nestle snugly, in groups.

The entrance to the cavern faces the east, and when first observed by the writer it was about six feet in height, and three and a half in width. The cave can be travered to a depth of 26 feet. Generally the crystals project from either side toward the central line of the cavern, approaching each other within about three feet, though some of the largest crystals extend entirely across the cavern like huge beams.

Fig. 3 is from a photograph of the interior of the cave, one massive crystal having been sawn off to afford a better view. The floor of the cavern consists mostly of sand, probably deposited by water in flood times, and carried in at all seasons by winds. Projecting out of the sandy floor are the terminations of many superb crystals. Inside the cavern, a yard from the entrance, the crystals descend within three feet of the bottom, so that one has to

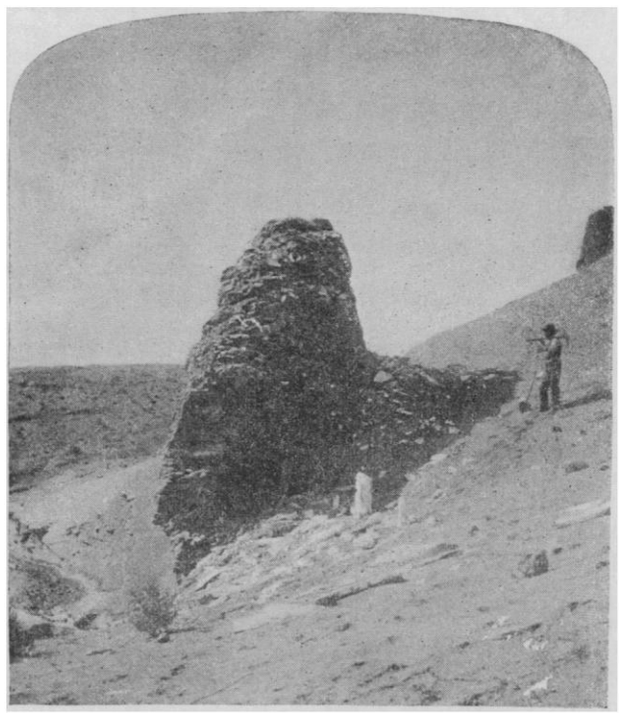

FIG. 2.

stoop to pass; but farther in there is room to stand erect, and near the back wall a person may clamber up to a height of fifteen feet. Looking upward from the bottom of the cavern, one sees a mass of mammoth prisms, suggesting, but for their singular beauty, the heavy timbers of a deep mine. The entire deposit is a colossal group of crystals, the like of which is seldom to be seen.

The writer's attention was first attracted to the place through receiving several small specimens of the selenite from sheep-herders, who had discovered the deposit while searching for feeding-places, and who claimed to have found a mine of mica, which they called "isinglass." Their disgust was great when assured, by the conclusive experiment of holding a bit of the material in the flame of a candle, that the stuff was not what it seemed. I first visited the place in April last, and my rapture at the superb display of crystal beauty was checked by the evidences of vandalism on every hand. Some of the finest crystals had been hacked and carved, and cow-boys' initials were scratched and cut on almost every prismatic face which the light could reach. Visiting the place again six months later, I found that still greater destruction had been waged, and, becoming convinced that good crystals would soon be difficult to obtain, I took steps to secure legal claim to the land, and proceeded to remove the remaining crystals of greatest value to a place of safety. Under the auspices of the Deseret Museum of Salt Lake City, the work of removal is still in progress. Already over twenty tons of most beautiful crystals have been taken out and shipped to this city.

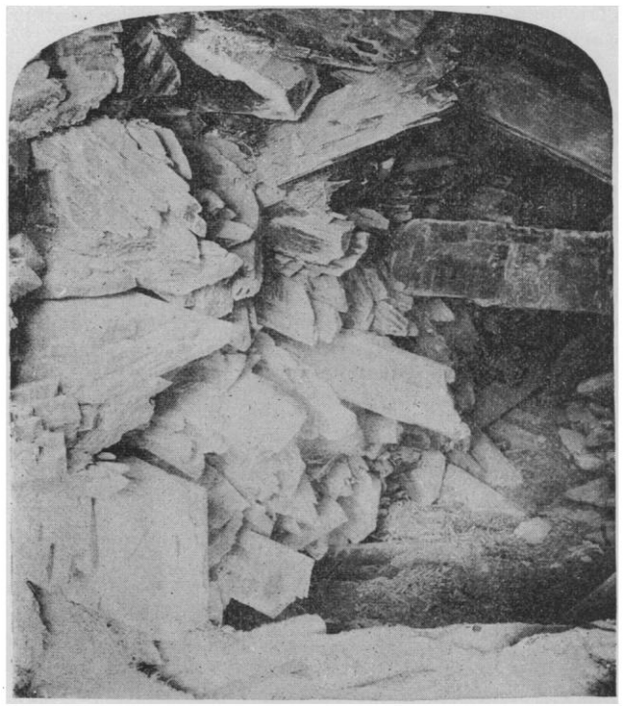

FIG. 3.

Prisms of perfect form and varying in length from one to five feet, and in weight from ten to one hundred pounds, are of frequent occurrence. One of the most regular yet taken out is four feet long, and the widest faces are six inches across. Cleaved slabs are obtainable six feet in length, and two and a half feet in breadth. One of the longest perfect prisms yet obtained extends fifty-one inches, and from one of its faces nineteen smaller crystals sprout. Twins are common, as are also compound terminations of very complicated structure. A magnificent group, weighing over six hundred pounds, was removed from the floor of the cavern; it was set up on the outside and photographed (see Fig. 4).

As to the habit of the crystals, in the midst of such variety it is difficult to specify. Prisms short and stout, also long and comparatively slender, are numerous; and of twins, the "swallow-tail" vie with the cruciform and penetration varieties in points of abundance and perfection. Some of the crystals are of perfect transparency, and cleaved slabs of this quality are common. Sometimes the prisms inclose sand and clay, which is so distributed as really to add to the beauty of the crystals in the eyes of all save the mineralogist. When fracture planes are made visible by striking a crystal containing such impurities, the particles appear on the internal planes as on shelves of glass.

Some of the finest specimens will probably be on exhibition in Chicago next summer.

THE FUTURE OHM, AMPERE, AND VOLT.

BY HENRY S. CARHART, ANN ARBOR MICH

SINCE the International Congress of Electricians in Paris in 1881, the most eminent physicists have been agreed as to the theoretical values to be assigned to the three fundamental units of electrical measurement; but it has been a matter of ten years' labor on the part of many distinguished investigators to embody these theoretical definitions in practical units for universal use.

Up to the date mentioned the two units of resistance in use were the British Association (B.A.) unit and the Siemens unit. Only the former represented an attempt to construct an ohm corresponding to the theoretical definition. The B.A. unit has served a useful purpose, but it is now known to be 1.34 per cent too small.

The "legal ohm" was provisionally adopted in 1883 by an international committee to which the Congress of 1881 had committed the subject. It was in the nature of a compromise, and fixed the practical ohm as the resistance at 0° C. of a column of mercury one square millimeter in cross-section and 106 centimeters long. Competent investigators, like Lord Rayleigh and Professor Mascart, contended that a column 106 3 centimeters in length was nearer the true value; but a few smaller values obtained by some well-known physicists decided the adoption of the mean value 106 centimeters. This conclusion satisfied no one, and the "legal ohm" was never legally or officially adopted by any European or American government.

FIG. 4.

Subsequently, Professor Rowland came forward with his determination of 106.32, and errors were found in the data of some who had contended for the lower values. Hence the number 106.3 has been tacitly accepted for two or three years already, and it is now believed that this does not differ from the true value by more that two units in the fifth figure; that is, the length of the mercurial column representing the true ohm is not less than 106.28 and not more than 106.32 centimeters.

Somewhat over two years ago a commission was appointed by the British Board of Trade to draft an "Order in Council" as a legal settlement of the units to be employed by the Board of Trade Electrical Bureau, and hence as the legal electrical units for Great