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Quicksilver is the most valuable metallic product. Its place of greatest abundance is at New Almaden; but it occurs in numerous other places in metamorphic Cretaceous, but generally in quantities or under conditions which have forbid its profitable extraction. Gold occurs in very numerous localities, but has not repaid working except in a few rare instances and on a small scale. Silver has been reported at various times, but no mines of value have yet been found. Copper occurs in very numerous localities, but thus far no vein containing workable quantities of ore is known. Iron, tin, antimony, and manganese ores have been found in limited quantities, but not in conditions of commercial importance. Chromic iron occurs in large quantities, but also valueless. Coal occurs in workable beds at Monte Diablo, and in less quantities and under less favorable conditions at other places. Asphaltum occurs in immense quantities, and oil has been obtained, and extensive explorations have been made for the latter with reference to wells of commercial importance, but thus far unsuccessfully. Borax is extracted with success at one place, and sulphur occurs in some places which may hereafter prove of value.

The mountain ranges and their valleys are without forests except on the immediate coast, but the most of the hills have scattered trees. The higher ridges are very barren and dry, the lower hills yield pasturage, and the valleys are often very fertile, some of them possessing the finest climate as well as the most fertile soil of the State.

We will consider the Sierra Nevada in a future article.

W. H. B.

Art. XXXIV.—*Contributions from the Sheffield Laboratory of Yale College.* No. X.—*Mineralogical Notices;* by Geo. J. Brush.

1. *On Cookeite, a new mineral species.*

Associated with the tourmaline and lepidolite of Hebron and Paris, Maine, there occurs a pearly micaceous mineral somewhat resembling *nacrite.* In searching for amblygonite on the Hebron specimens of lepidolite, Professor Cooke of Cambridge, some three or four years since, discovered that this substance had very remarkable pyrognostic characters. Before the blowpipe it exfoliates like vermiculite or foliated pyrophyllite, at the same time imparting an intense lithia-red color to the flame. Professor Cooke called my attention to this mineral at the time of his observation of its properties, but it was not until I visited the locality in 1863, that I obtained the mineral in sufficient quantity and purity to make further investigations in regard to it.

It is found coating crystals of rubellite, and appears to be a product of the alteration of this variety of tourmaline; in many instances cavities in the rubellite are filled with the nacreous substance. It is also intimately associated with lepidolite, sometimes in extremely minute scales, and not unfrequently in hemispherical aggregations; more rarely it is found in distinct six-sided prisms, which are bent into a vermicular form like some varieties of chlorite. In most cases it occurs so mixed with the tourmaline and lepidolite as to preclude the possibility of its being selected free from these minerals.

Its characters are as follows. Color white, in some cases yellowish-green, in thin scales transparent. Luster pearly, eminently so on the cleavage plane. Structure micaceous. Hardness 2·5. Specific gravity 2·70. In the closed tube, gives off much water, and, on treatment with the blowpipe flame, swells up and exfoliates in a remarkable manner, sometimes bursting the tube. The water which is first given off is neutral, in some cases where the mineral has been weathered it is even feebly alkaline; at a higher heat, however, it affords a small amount of fluorid of silicon, and this on contact with the water deposits a faint ring of silica and gives the water an acid reaction. The tube is also slightly dimmed or etched from the action of the fluorine. Before the blowpipe in the forceps, the mineral exfoliates like vermiculite and colors the flame beautifully carmine-red; it fuses on the thin edges, and with cobalt solution gives a blue color. With salt of phosphorus, gives a skeleton of silica. It is partially, if not completely, decomposed by sulphuric acid.

The limited amount of pure mineral at my command prevented as thorough a chemical examination of it as could be desired; but from a qualitative analysis it proves to be a hydrated silicate of alumina, lithia and potash, with only minute traces of soda. The alumina has some anomalous properties, and at first suggested the presence of some other substance which had escaped identification. When thrown down by ammonia, it seems somewhat less bulky and floculent in its character, and is much more easily washed than is usual with alumina; it, however, reacts blue when treated with nitrate of cobalt, and with the small quantity under examination I have been unable to identify the presence of any other element. It was completely soluble in potash and was insoluble in carbonate of ammonia, and did not react for either fluorine, boracic or phosphoric acids. Its sulphate, when treated with sulphate of potash, yielded octahedral crystals of alum.

The quantitative examination has been made by Mr. Peter Collier, assistant in this laboratory. For analysis, the mineral was ignited, then fused with carbonate of soda to determine the bases, and with carbonate of lime and chlorid of ammonium to determine the alkalies. The lithia was in one instance determined directly, and in the second case by difference, the potash being weighed as platin-chlorid of potassium, and the amount deducted from the total chlorids. The water was determined by igniting the mineral with perfectly dry oxyd of lead, and the difference, between this loss and the total loss on igniting the mineral alone was considered to be fluorid of silicon. Analyses:

	1.	2.	3.	4.	5.	6.	Mean.
Hygroscopic moisture, expelled at 100° C.	·40	·39	·36	....	....	....	·38
Water, - - -	13·89	13·87	13·89	....	....	....	13·41
Fluorid of silicon, -	....	....	....	....	....	0·47	0·47
Silica, - - -	35·04	34·05	35·71	....	....	....	34·93
Alumina, with a little iron, - -	45·11	45·28	44·35	....	....	....	44·91
Potash, - - -	....	....	....	2·57	....	....	2·57
Lithia, - - -	....	....	....	2·84	2·81	....	2·82
							99·49

The oxygen ratio of the $\dot{\mathrm{R}}$, $\bar{\mathrm{R}}$, $\ddot{\mathrm{Si}}$ and $\dot{\mathrm{H}}$ is 1·93 : 20·97 : 18·51 : 11·91, or approximatively 1 : 10 : 9 : 6, indicating a composition between that of euphyllite and that of margarite. The composition here given is as accurate as was possible to obtain with the small amount of the substance operated upon. The physical and the pyrognostic characters alone are enough to prove the mineral to be a new species, and as such I take pleasure in giving it the name *Cookeite*, after Professor Josiah P. Cooke, Jr., who I believe was the first to discover its remarkable pyrognostic characters.

2. *Jefferisite, a new mineral species.*

In the Ninth Supplement to Dana's Mineralogy, I described a chloritic mineral, which I referred with a query to *vermiculite.*[1] It is the well known brownish chlorite-like mineral from the serpentine quarry near Westchester, Penn., and like the preceding mineral exfoliates in a very characteristic manner when heated. I have recently learned, through Professor Dana, that Des Cloizeaux has determined vermiculite to be uniaxial in its optical characters, and consequently hexagonal in crystallization; and as the Westchester mineral is optically bi-axial, as stated in my first description of the mineral, it must form a distinct species. I propose for it the name *Jefferisite*, after the well known collector, Wm. W. Jefferis, Esq., of Westchester, the original discoverer of the mineral.

I have recently received from Mr. Raphael Pumpelly a similar mineral from Japan, possessing the same property of exfoliating when heated. Mr. Pumpelly informs me that it is found in the mountains of the Peninsula of Kadzusa, southeast of Yedo, and that it is used as an object of amusement by throwing it on coals. The specimens he has sent are small six-sided prisms, two or three lines in diameter. They have a brownish color and are very similar in physical and pyrognostic characters to Jefferisite.

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[1] For the physical characters and chemical composition, see this Journal [2], vol. xxxi, p. 369.