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AGRICULTURE, AND THE ARTS.

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1818.

[52] West of the Alleghanys, in Louisiana. Four years. Dunbar. Transatlantic climate.

[53] Madeira. Heberden. Climate of islands. St. Croix, of Teneriffe, 71·4°. The remainder of the island of Teneriffe, in the plains, 61·2°. Buch.

[54] Old observations of Tartebout. They appear good. Bagdat, lat. 33° 19′; according to Beauchamps, 73·8°. The four seasons, 50·8°, 74·6°, 92·6°, 77°; but there was reflection from a house. The thermometer falls to 29·8°. Under the equator, at 3,000 feet high; mean temperature, 71·2°.

[55] The calculations are made from the observations of Nouet (Decade, ii. 213). The following are the mean temperatures of the 12 months: 58·1°, 56·2°, 64·6°, 77·9°, 78·4°, 83·6°, 85·1°, 85·8°, 79·2°, 72·2°, 63°, 68·6°. (Neibuhr, 72·2.) Temperature of Joseph's Well, 72·5°. Catacombs of Thebes, 81·4°. Well of the great pyramid surrounded by sand, 88·2°. Jomard. Bassora, on the Persian Gulf; mean temperature, 77·9°; winter, 64°; summer, 90·8°; July, 93·2°.

[56] Orta. Humboldt. Nouv. Esp. iv. 516. Jamaica, coast 80·6°. Blagden.

[57] Ferrer, 1810—1812. Con. des Tems. 1817, p. 338. Wells of 10 feet deep; air, 76°; water, 74·4°; in 1812, maximum, Aug. 14, 86°; minimum, Feb. 20, 61·6°. Grottos, 81·5°. Humboldt, Observ. Astron. i. 134.

[58] Humboldt. Pondicherry, 85·1°; Madras, 80·4°; Manilla, 78·2°; Isle de France, coast, 80·4°.

ARTICLE VI.

Account of some remarkable Minerals recently brought to this Country from the Island of Jean Mayen, *in the* Greenland Seas, North *Latitude* 71°. *Also a Description and Analysis of a Substance called* Petalite, *from* Sweden. By Edward Daniel Clarke, LL.D. Professor of Mineralogy in the University of Cambridge, &c. In a Letter to the Editors.

GENTLEMEN,

TWENTY years ago, being engaged in a voyage among the *western* islands of *Scotland*, I had an opportunity of examining the very singular appearances exhibited by the *prismatic* rocks of *Canna*. The shores of that island are covered with a *jet*-black shining *sand*, which, owing to the partial notions I had then formed, and to prejudices imbibed by a residence among the *volcanoes* of the south of *Italy*, I supposed to be *volcanic*. Probably that *arenaceous* appearance had been derived from *basalt*, or *trap*. I have often, however, since regretted, that I did not

bring away some of the *sand* for further examination. It was therefore highly satisfactory to me to receive a short time ago, from the *Rev. Dr. Satterthwaite*, of *Lowther* Rectory, near *Penrith*, a parcel of *sand*, taken from the shore of the remote island of *Jean Mayen*, in the *Greenland Seas*, which immediately reminded me of the *sand* of *Canna*. It was supposed to be *ferruginous*; owing to the partial action of the *magnet* upon some of its particles. *Dr. Satterthwaite*, in his account of it, relates that "a few weeks before he sent it, he had been on board a vessel, just returned from the *Greenland Seas*, and had conversed with a very intelligent ship-captain; who, during his last voyage, had landed on the island of *Jean Mayen*, in 71°. N. L; an island seldom visited by the *English* fishermen; where he found the shores, to an immense extent, and of unknown depth, covered with this kind of *sand*." It has a *jet*-black colour, and a glittering appearance; owing to innumerable particles of minute *crystals*, of the highest transparency, with a splendent adamantine lustre. As these *crystals* differ in lustre from *olivine*, and agree with *olivine* only in their colour and *infusibility* before the *common blow-pipe*, I suspected that they might possibly belong to one of those varieties of *zircon*, which have sometimes been confounded with *olivine*, when mixed with *basalt* in the arenaceous form. This suspicion was further increased by examining them with a lens, and perceiving that in some instances a right prism with a square base might be discerned; or with a base so slightly rhomboidal, as not to be thus distinguished from a square. Having therefore selected a *crystal* of this form, but so exceedingly minute as scarcely to be discernible to the naked eye, I fixed it upon the moveable plane of *Dr. Wollaston's* reflecting *goniometer*. A double image was reflected by one of the planes of the crystal, but the image reflected by the contiguous plane was clear and perfectly perceptible, by which I was enabled to measure the angle of inclination; and after repeating the observation several times I found it to equal 92° or 92½°. Hence it is evident that these *crystals* are not *zircons*, although they possess a degree of lustre quite equal to that of *zircon*. In this uncertainty I sent a small portion of the sand to *Dr. Wollaston*, and requested that he would himself measure the *angle* of the particles exhibiting splendent surfaces. Dr. W. pronounced the substance to be *pyroxene*; having an angle, according to his observation, of 92½°. He also informed me that the sand was similar to that of *Bolsenna* in *Italy*.

Dr. Satterthwaite now sent me *three* specimens of different substances which had all received the appellation of *lava*, from the same island of *Jean Mayen*; and in every one of these I had the satisfaction of seeing the same crystals in their matrices; exhibiting the same splendent lustre, but under more visible circumstances of *form* and *cleavage*. In the *first* specimen they

are deposited in a dark porous *toadstone* rock, very like what is commonly called *lava* at *Naples*, and which, like the black arenaceous particles found with the crystals of *pyroxene*, is easily *fusible* before the *common blow-pipe*, into a *jet*-black shining glass, externally resembling black sealing-wax. The *second* specimen has the appearance of a substance acted upon by fire; it has a reddish brown appearance, looking like a cinder; being full of innumerable pores, and having the *spongy* aspect of the *scoriæ* ejected from *Vesuvius*. Besides containing these splendent crystals, it has also a few imbedded crystals of more opaque *pyroxene;* it fuses, like the preceding specimen, into a *jet*-black glass. The *third* specimen is a light grey, friable, earthy, aggregate, in which the crystals of *pyroxene* lie imbedded with dark roundish granular pieces of *basalt* or *trap* in a crumbling mass, that easily separates between the fingers. This last fuses, like the two former varieties, into a *jet*-black glass.

I have now done with the description of the minerals from *Jean Mayen* island; and shall proceed with an account of an interesting mineral from *Sweden* of a very different nature. This substance was sent to *Dr. Ingle* of this University, from *Mr. Swedenstierna* of Stockholm, under the name of *petalite*. Finding it to be altogether new to me, and that its nature was not likely to be made known by the name which had been given to it (no account of its analysis having appeared); I undertook to examine it chemically; requesting *Mr. Holme* to do the same; that by comparing the result of our observations we might be able to state the constituents with all the accuracy in our power. It will be proper, in the first place, to describe the *mineral*, and to point out those characters which induced me to consider it as a new substance.

Externally it resembles common *white quartz*, and to such a degree, that a very eminent mineralogist to whom *Dr. Ingle* exhibited this mineral, considered the specimen shown to him as a piece of *quartz*. Upon a nearer examination, however, it will be found to differ in fracture from *quartz*. It admits of a two-fold cleavage parallel to the sides of a *rhomboidal* prism; two of which parallel to each other are splendent, and the other two are dull. Hence there is an evident appearance of *crystallization;* but I was unable, owing to the want of two contiguous reflecting surfaces, to ascertain the angle of their inclination in a satisfactory manner. Its *specific gravity*, nearly that of *quartz*, equals 2·45. Its colour is *white*, but an almost imperceptible *pinkish* hue may be discerned when it is attentively examined. It is hard enough to scratch glass; although it may be razed by a knife. Exposed to the *common blow-pipe* it is almost *infusible;* but after an intense heat has been for some time continued, it exhibits a glazed superficies, which examined by a lens appears full of minute bubbles. When triturated and reduced to an impalpable powder in a porcelain mortar, it has the white-

ness of snow. Its most remarkable property remains now to be stated; namely, its partial solution and action in *acids*. Placed in highly concentrated *nitric acid* of spec. gr. 1·45, its loses its white colour and changes to a dingy hue; the *acid*, at the same time, becoming clouded. The same *acid* being boiled upon it, and distilled water, previously boiled, added, there was no appearance of effervescence, but a solution took place. From this solution *prussiated alkali* threw down a *leaf-green* precipitate; the supernatant fluid assuming afterwards a beautiful *amethyst* colour, which by longer exposure to the air changed to *brownish red*; afterwards becoming *reddish brown* and then *brownish black*. These changes of colour leading us to suspect the presence of *manganese*, we undertook the analysis in the following manner:

A. Ten grains of the powder were exposed to a red heat, in a *platinum* crucible, during a quarter of an hour; to expel the water of absorption. The same powder being afterwards weighed, had lost $\frac{1}{16}$ of a grain.

B. Boiled during 20 minutes in *nitric acid* diluted with an equal bulk of distilled water, the insoluble part, washed, and dried in a white heat, weighed $9\frac{1}{4}$ grains.

C. The supernatant fluid collected from B, added to the washings of the insoluble residue, being with moderate heat evaporated to dryness, there remained a pale *lemon-coloured* salt; which, after exposure to a smart red heat for 25 minutes in *platinum foil*, left a *black* powder weighing $\frac{1}{4}$ of a grain; this powder before the blow-pipe gave a fine purple colour to *borax*, and proved to be the *black oxide* of *manganese*.

D. The insoluble substance left by the *nitric acid* in B being mixed with five times its weight of the *bicarbonate of potash*, was placed in a *platinum* crucible, and kept exposed, during three quarters of an hour, nearly to a white heat the whole time. Distilled water was then dropped upon the fused alkaline mass (which appeared slightly tinged with a *rosy* hue), merely in sufficient quantity to soften it; *muriatic acid* being afterwards added, the whole assumed a gelatinous appearance. Upon the addition of more *muriatic acid* a white powder subsided; which, being carefully washed and dried in a white heat, weighed *eight* grains; it proved to be pure *silica*.

E. To the supernatant solution and washings collected from D, a sufficient quantity of *alkali* was added, barely sufficient to neutralize the *acid*. Pure liquid *ammonia* was then poured in, and a white flocculent precipitate slowly subsided, leaving the fluid above it, beautifully transparent. This precipitate, carefully washed and dried as before weighed $1\frac{1}{4}$ grain, and proved to be pure *alumina*.

The constituents therefore of this mineral, according to the preceding analysis, may be stated in the following manner:

Silica	80
Alumina	15
Manganese	2·50
Water	0·75
Loss	1·75
	100·00

This was the result of my own analysis. The analysis made of the same substance by *Mr. Holme*, does not materially differ from the preceding; and when it is considered how very seldom a *second* analysis, made by the same person, of substances wherein *silica* and *alumina* are chemically combined, exactly corresponds with the *first*, it would perhaps better answer the purposes of chemical science if the discrepancy were confessed rather than concealed. At all events this shall be the case in the present instance.

According to *Mr. Holme's* analysis of this mineral the same constituents are combined in the following proportions:

Silica	$76\frac{8}{16}$
Alumina	$20\frac{8}{16}$
Manganese	$2\frac{8}{16}$
Water	$0\frac{10}{16}$
	$100\frac{2}{16}$

It has been stated that this mineral came from *Sweden* under the name of *petalite;* possibly it may not be the substance to which *Dandrada* gave this name. Should this prove to be true, as it will be necessary to bestow some name upon it, we are desirous of calling it *Berzelite*, in honour of the illustrious chemist who presides over the analytical researches of the country in which it was discovered.

I have the honour to be, Gentlemen, &c.

Cambridge, Jan. 21, 1818. EDWARD DANIEL CLARKE.

ARTICLE VII.

Some Observations on the Imperfection of the Barometer. By John Bostock, M.D., &c.

BEING engaged, some years ago, in an inquiry respecting the manner in which the weight of the atmosphere is affected by the blowing of different winds, and especially by the two cardinal winds of this climate, the N.E. and S.W., I wished to establish an accurate comparison between the height of barometers in different parts of the island. In order to accomplish