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## IX.

*Short Notices concerning the Properties and external Characters of some new Fossils from Sweden and Norway; together with some Chemical Remarks upon the same. By Mr. D'ANDRADA. In a Letter to Mr. Beyer, Master of the Mines at Schneeberg.*

SIR,

WHEN you had the goodness to inspect some specimens of the new fossils, which I have found in my last travels in Sweden and Norway, and brought along with me, you desired to become acquainted at least with their number and names. I comply with this suggestion; but wish, at the same time, I were also able to communicate to you a description in my own manner, as well as the results of the analyses which I have already made of some of them, together with that of others, which at present are the object of my occupation, and of those of which Professor Abilgaard has undertaken the analysis at Copenhagen. However, having destined those descriptions and accounts partly for the Academy of Sciences at Stockholm, partly for Copenhagen, partly for the Berlin Society of Friends inquiring into Nature, and partly for the Philomathic Society at Paris, I must for the present deny myself the pleasure of describing them fully.

You will receive, together with this letter, only a few of these species of fossils, together with a short notice concerning their properties and characters.

## I. ACANTHICONE.

The colour is leek and olive green, and sometimes, though seldom, that of the greenish. Specific gravity from 3.4075 to 3.3562; but that of the more compact sort 3.3000. It is not scratched by quartz, and it gives fire with steel. The texture of the mixed specimens, or in lumps or crystallized, is foliated, but in the others fine splintery, and more compact. The laminæ are thin, very coherent, and of a three-fold crossing.\* The entire splinters are quadrangular parallelepipeds with oblique terminations. On the edges it is transparent. The internal lustre is of the vitreous kind. The crystals are, (1.) quadrilateral, hexahedral and decahedral columns, terminated in dihedral, tetrahedral, and hexahedral pyramids; and sometimes also without pyramidal terminations. (2.) Tables or plates, quadrilateral, oblong, rhomboidal, sharpened off on the long narrow lateral facets.

\* *Durchgang* in the German. Many fossils are capable of being split in various directions; so that the laminæ cross or tranverse each other under various angles, and hence each particle of such a fossil must belong to one or more laminæ. If these cut each other in one direction only, as in mica, talc, &c. it is called *single crossing*; if in two directions, as in the feld-spar, hornblende, hyacinth, it is called *twofold crossing*; if in three, as in spathose iron ore, ponderous spar, galena, &c. it is then called *threefold crossing*, and so on. See *Emmerling Lehrbuch der Mineralogie*, 1793, Vol. III. 479.---Trauß.

If two of these plates be rubbed upon each other, they are a little phosphorescent, and emit a smell resembling that of quartz by friction. Acanthicon is in some degree pyro-electrical. Before the blow-pipe upon charcoal it readily fuses, with effervescence, into a blackish scoria replete with air-bubbles. In the cold it is insoluble in the sulphuric and nitric acids. This fossil occurs in the Swedish iron-mines, near Persberg, Långban, and Norberg; but in Norway very beautiful specimens of it are met with in the Kallak mines at Helgoland, and near Arendal in the iron-mines Tornbiornbo, Ulrica, Næbro, &c. Till now it was mistaken, or confounded with schorl, or with green garnet. Some crystals are so large as to weigh five pounds.

## II. SPODUMENE.

The colour is commonly a greenish-white of various shades. The lustre that of the mother-of-pearl. In the substance itself it is little transparent, but much so on the edges. Its specific gravity is 3.218. It scratches glass, but is itself scratched by quartz, and affords a white powder. It feels colder than quartz, yet dry and smooth. Spodumene is not at all electric, nor phosphorescent; nor does it afford a quartz-like smell by friction. Its texture is lamellar, with a double crossing. Its perfect fragments are rhomboidal acute-angled prisms ( $120^\circ$  and  $55^\circ$ ). The fragments of the cross-fracture are for the most part longish plates, that have their edges but little sharpened. When subjected to the blow-pipe upon charcoal, it becomes, at the first gentle impression of heat, opaque, dull, and yellowish; then develops itself in the direction of its laminæ, at the same time that it swells a little, falling afterwards into an insipid powder, which by a stronger heat affords a very transparent greenish-white glass. Nitric acid does not dissolve it, nor produce any effervescence. It is found, together with several other fossils, in the remarkable formation of iron at Uppsala, in Skarrgarde, three miles from Dalero.

## III. SAHLITE.

Its principal colour is a pale asparagus green of various shades. Its external surface vitreous, inclining to wax, but internally it has little splendor. It is transparent, and sometimes semi-pellucid, if the crystals are pure, and have suffered no decay. Specific gravity 3.2368. Sahlite barely marks glass, and does not strike fire with the steel, and is easily broken. Its texture presents straight and smooth lamellæ, thrice crossing each other in a somewhat acute-angled direction. The fragments of the cross-fracture are roundish. Their form of aggregation is of the coarse-grained kind, and sometimes, if the stone be in lumps or masses, they are hamated, or indented into each other. This stone occurs in crystals of rectangular, quadrilateral columns, the lateral edges of which are slightly truncated, and convex. The broad terminating edges of these columns are slightly truncated. The streak by rasure is white. This stone is somewhat soft and idio-electric. When rubbed upon a piece of the same kind, it emits no odour, nor shews any phosphorescence.

escence. Before the blow-pipe it is infusible. It is found in Sweden, in the Sala silver-mine in Westermannland. I have likewise discovered it in Buoen, three quarters of a mile distant from Anen, in Norway, where it occurs in masses, straight and thick foliated.

#### IV. ICTHYOPHTALME.

The chief colour yellowish-white. Lustre like mother-of-pearl, approaching to greasy. This fossil is transparent. Its specific gravity is 2.491. It scratches glass and easily admits of being filed; affording a white powder of a rough feel. Its own substance feels smooth, but not very dry, and is as cold as quartz. It is very difficult to pulverize it. Texture lamellar, of a more than triple crossing. When crystallized the laminæ are large; but they are small when the fossil is massive, or exhibits a splintery fracture. The form of the crystals cannot be determined, as they are very much concretioned, and strongly cohere with each other. The fragments of the transverse fracture are irregularly angular, in some instances orbicular with sharp edges. When first acted on by heat upon the charcoal before the blow-pipe, it undergoes no change, not even with respect to its colour; but in the more violent second heat the pointed edges run into a white enamel. With sulphate of lime (gypsum), the ichtyophthalmé is infusible; on the contrary, it runs, when mixed with flux of lime (fluor-spar), into a semi-pellucid milk-white glass, the fusion being accompanied by a little effervescence. This fossil occurs at Uton, in Sweden, and consists of siliceous and a little alumine, or argillaceous earth.

#### V. COCCOLITE.

As to colour, coccolite is mountain, grass, and olive-green. Its lustre is vitreous and resplendent. It is opaque, and its specific gravity is 3.316. It scratches glass, but excites only a few sparks with the steel. Its streak is grey, or greyish-white; its texture broad foliated, in which a single crossing of the laminæ is observable. It is an aggregate of large coarse and fine grained, granular polyhedrons. These grains appear in some instances to be short quadrilateral columns, sharpened at both ends, and having pyramidal terminations joined to, or superimposed upon, the lateral surfaces. This stone is infusible by itself. With carbonate of pot-ash it fuses with effervescence, and swells to a frothy scoriaceous glass, of a dirty olive-green colour; and with borax it produces a pale-yellowish semi-pellucid glass. It is met with in the iron-mines Hellesta and Assebro, in Sudermannland, as well as in Nerike, in Sweden and likewise in a beautiful form in the Arendal iron districts of Norway.

#### VI. APHRIZITE.

Colour black, somewhat greyish. External lustre vitreous, inclining to the gloss of fat; internally a little resplendent. Aphrizite is opaque. Its specific gravity is 3.1481. It gives fire with steel, and cannot be filed; is very brittle, and readily broken. Its texture is compact. The cross fracture is smooth, a little even, inclining to the flat conchoidal;

and the fragments of it amorphous, yet angular and of sharp edges. The crystals are hexahedral, short and thick columns, which sometimes, from the different truncatures of the edges, have the appearance of dodecagonal columns. Both species are terminated in tetrahedral pyramids. This stone is feebly idio-electric, but not at all pyro-electric. It intumesces before the blow-pipe on the very first action of heat, frothing at the same time and yielding a greyish or yellowish white glass. With borax it effervesces, foaming strongly, and produces a greenish white pellucid glass. It occurs at Langoe, a small island not far from Krageroe, in Norway.

## VII. ALLOCHROITE.

Allochroite possesses a yellow-grey, and, in some instances, a dark straw-yellow colour. It has little lustre of the vitreous kind, which in the recent fracture passes into that of wax. It is opaque. Its specific gravity is 3.5754. It is just scratched by quartz, gives fire with steel, and is not easily broken by the blow of the hammer. Its texture is compact, and it is met with in large, thick slaty plates, with a decayed yellowish-white surface. Fracture uneven, of the small and perfect conchoidal kind. Fragments angular and indeterminate, not much sharpened at the edges. It is infusible alone as well as with borax of soda (borax). When treated with microcosmic salt (phosphate of soda and ammoniac), it exhibits an enamel-like, more or less perfectly fused surface, which, on gradual cooling, shews at first a reddish-yellow, then a green of differently deep tints, and at last a dirty yellowish-white colour. This change of colours seems to indicate some metallic ingredients. The native place of this stone is the mine Wirum, in the vicinity of Drammen, in Norway.

## VIII. INDICOLITE.

The colour of this stone is a dark indigo-blue, a little lighter in the fracture, so as to incline to the azure or sky-blue. Its external lustre is vitreous in a high degree, approaching to the metallic splendor. It is untransparent, and not very heavy. Its specific gravity cannot be accurately ascertained, on account of the small crystals bedded in it. Quartz is a little scratched by it. It is easily broken. The streak is blueish-grey. It feels cold and dry like feld-spar. Its texture appears to be compact; but the longitudinal fracture is finely striated, and the cross fracture somewhat uneven, passing into the small conchoidal. Its crystals are rhomboidal columns, much striated lengthways. The fundamental form of crystallization seems to be quadrilateral; but for the most part these crystals are polyhedral, needle-shaped and stellular. It does not fuse before the blow-pipe. It is found near Uton, in Sweden.

*Note.* This fossil resembles in its colour the lazulite of Professor Klaproth, which I know only by description: but as to its other physical and chemical characters it differs from it.

*(To be concluded in our next.)*

X.—*Experiments*

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II.

*Short Notice concerning the Properties and external Characters of some new Fossils from Sweden and Norway; together with some Chemical Remarks upon the same. By Mr. D'ANDRADA. In a Letter to Mr. Beyer, Master of the Mines at Schneeberg.*

*(Concluded from page 196.)*

IX. WERNERITE.

**I**TS colour is a medium between the pistaccia-green and Isabella-yellow, of different shades of yellow. Inwardly its lustre is of the fatty kind, approaching to that of the mother-of-pearl, sometimes in a high degree resplendent, and sometimes a little chatoyant, but without any distinct play of colour. In small fragments it is very transparent; and its specific gravity is 3.6063. It cuts glass, but gives little fire with steel, and can be scratched by the common feld-spar. Its texture is somewhat curvilinearly foliated, and when the lamellæ are considerably curvilinear, the fracture appears chatoyant. The laminæ seem to cross each other twice in an oblique direction. The cross fracture is uneven and fine splintery; and its fragments are splintery, with sharp edges and pointed. Wernerite occurs in masses and crystallized. The crystals are low, hexahedral columns, with tetrahedral terminations, having their terminating faces imposed on the lateral edges. In those specimens, which are found in lumps or masses, the form of aggregation is large and coarse granular, and very much concreted. This stone readily frothes upon charcoal before the blow-pipe, and its edges exhibit an opaque, white, imperfect enamel. It occurs in the iron-mines Northo and Ulrica, in the Arendal territory in Norway, and also in Campolongo, in the Lewindale, in Switzerland. This fossil bears great resemblance to the adamantine spar in its colour and lustre.

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## X. PETALITE.

The colour most frequently occurring is reddish, and in some instances greyish-white. Its internal lustre is ordinary and glittering, now and then with a little splendor, and in that case of a faint appearance of mother-of-pearl. The edges are a little transparent. Specific gravity rather above 2.620. It cuts glass and is itself scratched by feld-spar. It hardly strikes fire with steel. It occurs in lumps of a fine and also of a rather coarse aggregation. Its texture is foliated or scaly. The lamellæ are very minute, throughout strongly concreted with each other. Their crossing is but single. The fragments of the cross fracture are angular, amorphous, and not very sharp in the edges. It is broken with great facility, and easily reduced by grinding into a subtle, white, rough, and dry powder. When one piece is rubbed against another, it emits a faint smell resembling quartz. When treated alone with the blow-pipe it is infusible, without change of colour or lustre. With borax it produces a white, transparent, vitreous globule, and with microcosmic salt a yellowish-white pearly glass, full of fine air-bubbles. With nitric acid it does not effervesce, whether in the state of grains or of powder, but a portion is gradually dissolved by that acid. Petalite is found near Utoen, Sala, and Fingrufan, near Nyakoperberg, in Sweden.

## XI. CHRYSOLITE.

Colour snow-white. Lustre faint, like a weak splendor of mother-of-pearl. Very transparent. Specific gravity 2.9698. It scratches calcareous spar, but is itself scratched by fluor-spar. It may be readily broken in pieces, and is rather soft. It yields a very subtle, white powder, of a soft feel, which, if moistened with water, becomes transparent. This fossil feels dry, and is cold, like feld-spar. Its texture thick and broad foliated, with an irregular roughness, like water that has been suddenly congealed to ice. Its laminae are straight, and their crossing threefold. The parts separated by splitting, when entire, are of a cubical form. The aggregation of its integrant parts is such, that the juncture of two is always covered by a third, super-imposed like bricks, which originates from the circumstance, that two crossings are straight and of the broad foliated kind, while the third is partly laminated, partly broken, partly uneven. Before the blow-pipe chrysolite fuses even before ignition, like ice melting without effervescence; and it yields a snowy-white opaque pearly mass, which by a stronger heat becomes rough, full of bubbles, and depressed in the middle, being also caustic in that state when put on the tongue, and possessed of a taste similar to that of borax. When heated with borax, this fossil is fused to a pellucid glass, which, however, upon cooling is opaque and white. When fused with pot-ash in a silver crucible, it turns to a white porcelanic mass; which, when dissolved in distilled water, and precipitated by means of nitric acid, yields a white, transparent pasty mass, which after desiccation may be fused again in the same manner as the crude fossil. In the nitric and muriatic

muratic acid it is insoluble. With very concentrated sulphuric acid it strongly effervesces, emitting then whiteish, gaseous vapours, which attack glass. This peculiar fossil consists of alumine, fluoric acid, and a little pot-ash. It occurs in Greenland, but its native particular spot is not yet known, though it appears to form strata.

## XII. SCAPOLITE.

The colour of this stone is yellowish and greyish-white, and also smoky-grey. Its external lustre vitreous, from the gloss of wax to a brighter polish, but its internal lustre has little brilliancy. This stone is more or less transparent on the edges, but it is entirely opaque when decayed. Specific gravity from 3.680 to 3.780. It admits of being scratched with a knife, but itself scratches glass. Its streak is white. The crystals are nearly rectangular quadrilateral columns (having angles from  $85^{\circ}$  to  $95^{\circ}$ ), with very slightly truncated lateral edges, without pointed terminations. These crystals are very minute, and in that case almost needle-shaped; seldom large, with transverse shootings, and longitudinally striated. The small and very small ones are usually concreted cross-ways with each other in regular clusters (*druſen*) and prismatic; but the larger are totally bedded in the matrix. Their texture is lamellar, but in the larger crystals it approaches to the striated. When split a visible diagonal crossing is perceived lengthways, and a second one less perceptible which is longitudinal and oblique-angular. The cross fracture of scapolite is uneven, and the fragments of this fracture are prismatic (bar-like). It may be easily broken, and is not electric. Before the blow-pipe it readily fuses, with frothing, into a white translucent enamel. It is found in the iron-mines near Arendal, in Norway.

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