It is in this manner shown that after the lapse of more than half an hour, the cholera germs may still adhere to living insects. And if we bear in mind what long distances flies may accomplish in such a time, the possibilities of having eatables infected, such as soup, pudding, milk, etc., must not be undervalued.

In conclusion I wish to remind you of a somewhat heroic deed which an Australian community performed a few years ago. The steamer "Dorunda" had arrived with cholera patients on board at Townsville and was ordered to proceed south. But the Townsville people, most anxious to give help and to separate the healthy from the affected, petitioned the Queensland Government to allow the passengers to land at their Quarantine Station, inviting as it were, the disease into their midst, well knowing what dangerous possibilities to their own welfare this action might involve. I have always considered this spirit of the Townsville people as a true spirit of courage and philanthropy. What a contrast is not this to the action of an American crowd on a similar occasion, who prevented forcibly the landing of females and children—in a healthy state, but exhausted through exposure—at the Quarantine Station near New York in September last.

ON NATIVE COPPER IODIDE (MARSHITE) AND OTHER MINERALS FROM BROKEN HILL, N. S. WALES.

By C. W. MARSH, Communicated by Prof. LIVERSIDGE, M.A., F.R.S.

[*Read before the Royal Society of N.S. Wales, December 7, 1892.*]

THIS mineral occurs as implanted crystals, not larger than $\frac{1}{24}''$ through, on siliceous gossany cerusite, coated with ferro-manganese; crystallization, tetragonal-hemihedral. Colour, reddish oil brown, lustre resinous, translucent. Streak, orange-yellow. Brittle, fracture subconchoidal.

Heated in closed tube; partly fuses, spreads up tube, dark brown when hot, reddish-brown when cold; partly volatilized as beautiful violet fumes, condensing on cold part of tube as steel-grey acicular crystals, which are volatilized in violet fumes on heating, leaving a whitish skeleton residue.

Heated in open tube partly fuses with dense violet fumes, condensing on cool part of tube, having acid reaction, fused mass greenish-yellow, by further heating violet-black.

Heated on charcoal in O.F.; effervesces with dense green flame, (similar to tellurium) coating charcoal near assay dirty red, surrounded by yellowish-green, passing over in outer part to bluish-white, with white border. This is consumed by continued blowing in O.F. or R.F. with dirty green flame in outer parts, changing to bluish-green nearer the assay piece, after which iridescent stains are left on the charcoal.

On charcoal in R.F. alone, much the same as above. With soda, dense bluish fumes, with heavy white incrustation, leaving eventually a globule of copper* and magnetic speculæ. (The latter probably due to mechanical impurities). With borax or phosphor salt on platinum wire, gives copper reaction with green flame.

Powder treated with cold HNO_3, slightly soluble, solution brownish-oil green. Hot, gives deep red solution, from which violet fumes escape, condensing on cool part of tube, as translucent steel-grey acicular crystals, (which removed and dissolved in water gives blue solution with starch) similar crystals form in solution while cooling. These may again be dissipated by boiling, after which the clear solution gives with ammonia the reaction for copper, and a yellowish-white precipitate with silver nitrate. No precipitate with barium nitrate, slight colouration with ammonium molybdenum. This precipitate after washing, treated in bead of phosphor salt gives pure green flame colouration; after removal of precipitate the solution gives a blue colour with starch water.

---

* The globule of metal dissolved in HNO_3 gives copper reaction with ammonia, no precipitate with H_2SO_4 or HCl.

Powder treated with cold HCl; only slightly attacked, solution dark in colour. With hot HCl, partly decomposed, leaving grey residue; the cooling solution deposits white flocculent precipitate which is increased by the addition of water.

Powder treated with H_2SO_4 is partly soluble with violet fumes similar to the nitric acid reaction, only much denser.

Powder treated with acid potassium sulphate in closed tube, fuses to a green mass with dense violet fumes, which turn starch paper blue.

[Mr. Marsh forwarded to me a small specimen of the copper iodide, and I have verified the principal characteristics as given in his description; as the mineral appears to be a new one, I suggest that it be named Marshite, in recognition of Mr. Marsh's discovery and the zeal and diligence which he has shown in collecting and describing the minerals of the Broken Hill district.—A. Liversidge.]

Additional notes on the mode of occurrence of Copper Iodide.

The crystals of copper iodide from which the above examinations have been made, are in most cases implanted on what appears to have been similar crystals belonging to an earlier period of formation, but which had already suffered partial decomposition. Their outer surfaces being changed to impure black oxide of copper—in some instances thickly coated with oxide of manganese—with a yellow resinous-like substance in the centre. These partly decomposed crystals on account of the difficulty in getting a pure sample, have as yet only been tested for copper and iodine, for which they give reactions similar to the later formed unaltered ones.

A third, and earlier date still, is traceable in the deposition of well formed crystals of anglesite, against the sides of which crystals of copper iodide, belonging to both the earlier and later formations are imposed.

We have thus indirect evidence of three well marked stages of deposition, which appear to warrant the following conclusions:—

1. A cavity in gossany carbonate of lead ore has been coated with iron and manganese oxides, on which has been implanted at irregular intervals, well formed crystals of anglesite, one of the largest measuring fully 5 mm. along the edge.
2. After the complete development of the anglesite, a crystalline deposit of copper iodide took place, covering the greater part of the floor space between the anglesite crystals. After the completion of the copper iodide deposit, a change of conditions appears to have occurred, resulting in their partial decomposition. This change being accompanied by a deposit of manganic oxide which has in many instances covered the partly altered crystals.
3. These conditions appear to have been again reversed and a second deposit of copper iodide to have been formed upon the partly altered and incrusted surfaces of the older crystals.

These later formed crystals show no signs of decomposition or incrustation by other substances, and appear to favour the assumption that conditions suitable to their development prevailed up to the time of their discovery.

Other Minerals.

(No. 2) A peculiar mineral not yet satisfactorily classified. At first appearance resembles a tangled bunch of cord that had been dipped partly in white and partly black paint. Now if you will imagine the cord to be changed to impure chalcedony, the white paint changed to a fine pearly foliated kaolin-like mineral, the black parts being due to penetrating oxide of manganese, you will have a very fair idea of the appearance of the specimen and a rough outline of its composition.

Result of preliminary trials—*White variety.*—B.B. infusible; in borax and phosphor salt gives reaction for silica only; fused with cobalt nitrate yields blue mass. Heated in glass tube (closed) gives water, also white fumes condensing as faint sky blue sublimate (not tested). Powder boiled in H_2SO_4 becomes highly explosive; partly decomposed in nitro-hydrochloric acid, more completely so if first fused with potassium bi-sulphate. After the removal of silica in the usual manner, alumina is thrown down by ammonia, from the filtrate lime is precipitated by ammonium oxalate, and a little magnesia, by sodium phosphate. *Black variety* gives manganese reaction with borax lead, otherwise essentially similar to above.

[The very small specimen of the white coralloid mineral forwarded to me consists of chalcedony coated with what appears to be Gibbsite or aluminium hydrate; the coating has a greasy feel, and under the microscope is seen to have a fibrous structure, and on scraping it off a white fibrous matted powder is obtained; this gives the reactions described by Mr. Marsh, except that I did not obtain any sublimate, and I am inclined to think that the silica left in the microcosmic salt bead is not combined with the alumina but intermingled mechanically. The black coralloid portions consist mainly of black oxide of manganese, and when treated with HCl give off chlorine copiously and leave a siliceous skeleton or core in much the same way as the stalactitic hæmatite from the Mount Morgan Gold Mine.—(Journ. Royal Soc. N.S. Wales, 1891, p. 236)—A. Liversidge.]

(No. 3) Is a mineral of which we have numerous specimens. It usually occurs as implanted connected crystals on limonite. It consists principally of lead, with varying proportions of phosphorus arsenic and chlorine; some with, others without lime, on some specimens the crystals are coated with a bright gold-yellow to copper-red film, which I have not yet been able to satisfactorily determine. From some of these films I have got the reaction for molybdic acid, whilst from others, apparently similar, no such reactions could be obtained.

These minerals appear to form various links between mimetite and pyromorphite, or more properly speaking a combination in various proportions of the two minerals. But as they cannot be classed directly as either, and as they sometimes contain lime, I have classed them irrespective of their slight changes in composition as hedyphane. Moreover there are many points of essential difference in crystalline structure, and mineral associations between the three minerals; for instance the so-called hedyphane is (1st) usually in short hexagonal prisms. (2nd) The crystals are often coated by films of what appears to be different material, in which case they are usually accompanied by iodide of silver, being in all cases the latest deposit. On the other hand mimetite or pyromorphite when occurring as hexagonal prisms, have a widely different appearance, the latter being usually flat topped or but slightly bevelled, while the former is generally truncated, much bent or bulged out as it were at the top; while the incrusting film and accompanying iodide of silver characteristic of hedyphane (?) have not yet been noticed.

(No. 4) Another peculiarity in composition is found in a mineral that I have classed as aurichalcite. It consists essentially of zinc-copper carbonate; some samples containing water others not. The latter can scarcely be classed as smithsonite since it contains from traces to 3% of copper. This mineral occurs usually as implanted semi-transparent crystals, from a sky-blue to dark bluish-green colour. It is the opinion of many that the copper present is only a mechanical impurity. I look upon it however, as being in chemical combination. Amongst the numerous specimens of this mineral in the collection, it would be almost impossible to get two of similar appearance and composition. This is not only true of the zinc minerals, it applies also to the various lead, copper, and silver ores belonging to this collection, I recognized this fact early in the progress of my work here, and discovered that in order to render the classification of this (*i.e.* the Aldridge) collection useful and instructive, it would be necessary to base it on the more essential constituents of the minerals, neglecting in many cases their minor differences, otherwise the classification would have been encumbered by unimportant information, and the list of varieties carried to an extreme limit.

[This mineral is zinc carbonate containing small quantities of copper, the amount of copper is not sufficient to regard the mineral as aurichalcite.

Later on I wish to submit the specimens of the above four minerals forwarded to me by Mr. Marsh to a fuller examination. —A. Liversidge.]

ON THE COMET IN THE CONSTELLATION ANDROMEDA.

By JOHN TEBBUTT, F.R.A.S. &c.

[*Read before the Royal Society of N.S. Wales, December 7, 1892.*]

ON November 12th the following cable message from London, dated November 10th, appeared in the *Herald*:—" A comet has been discovered in the constellation Andromeda: it is increasing in brightness." Clouds prevented a search for the comet on the evening of the 12th, but on the following evening the sky was beautifully clear, and I accordingly swept the constellation referred to with an ordinary opera-glass and soon detected a small nebulous object close to the Great Nebula. It could be seen in the same field of view with the Great Nebula, and was just visible to the naked eye. I succeeded in obtaining three differential measures of its position, but they did not afford any indication of proper motion. The object could not, however, be found in a Catalogue of Nebulæ visible in a telescope of four inches aperture. There was therefore *prima facie* evidence of its being the comet telegraphed from London. The next evening the sky was densely clouded, but on the 15th I again succeeded in observing the object and found that it had changed its position sensibly in the forty-eight hours. Its cometary character was therefore established beyond doubt. Had it not been for a sensational London cable message appearing in the daily press on November 16th to the effect that the new comet just discovered in Andromeda would be only a million of miles from the earth on the 27th, I should have