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NOTE ON SOME BISMUTH MINERALS, MOLYBDENITE, AND ENHYDROS.

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[Plates VIII. IX. X.]

The minerals mentioned in the following short note form part of a collection recently purchased by the Trustees of the Australian Museum; some of them are of unusual interest, hence it was considered desirable to draw attention to them in the pages of the "Museum Records." The numerals simply indicate the different specimens examined and described, those which are of the ordinary character and from well known localities are not mentioned in this paper.

Native Bismuth.

1. Some of the bismuth is in the massive condition, and is similar to specimens already described in the "Journal of the Royal Society of New South Wales," 1891, other specimens show it in the form of acicular crystals running through rock crystal. The massive bismuth is associated with quartz, both crystallised and massive, sulphide of bismuth, bismuth ochre, galena, the latter argentiferous, iron pyrites passing into ferrous sulphate, wolfram, molybdenite and tin stone. From Kingsgate, Glen Innes, N.S.W.

2. The acicular crystals in one case are two to three inches long and of about the thickness of a horse hair, these completely penetrate the rock crystal in much the same way as we often see acicular fibres of rutile; the characteristic colour, metallic lustre and cleavage of the metal being, however, well shown. This appears to be an unusual mode of occurrence for bismuth. Kingsgate.

3. Accompanying the fibres of the metal are small scattered crystals or specks of the metal, together with small columnar crystals. Kingsgate.

4. Native bismuth in quartz from Tingha, N.S.W.

5. Native bismuth, from Kangaroo Hills, Queensland. Associated with chlorite, quartz, and red oxide of iron or gossan.

6. Native bismuth, from Biggenden, Queensland. In calcite, where it occurs mainly between the cleavage planes of the calcite, which is strongly striated like some of the Scandinavian specimens of that mineral.

7. Native bismuth, in hornblende and quartz; Mt. Ramsay, Tasmania.

Bismuth sulphide.

1. In plates or films with a finely fibrous structure, embedded in rock crystal. The sulphide also occurs in granite made up of a brownish felspar, quartz and decomposed mica. From Kingsgate, Glen Innes, N.S.W.

2. Massive bismuth sulphide also possessing a fibrous structure, with the native metal, from the same place.

3. With bismuth carbonate and magnetite, Biggenden, Queensland.

Bismuth carbonate.

1. This is of an ochrey form, associated with bismuth sulphide, quartz, etc. From Kingsgate, Glen Innes, N.S.W.

2. This specimen is massive, and possesses a platy or laminated structure.

3. Gold with bismuth carbonate, Yarrow Creek, N.S.W.

4. In a fourth specimen, from Biggenden, Queensland, the carbonate occurs with native bismuth in quartz, and is of a greyish colour, instead of the yellowish tint exhibited by the Kingsgate carbonate.

5. This specimen, from Mt. Shamrock, Queensland, is said to be auriferous.

6. From Halifax Bay, Queensland.

Molybdenite (MoS_2).

[Plate viii.]

Found associated with native bismuth and other minerals, as already mentioned, in quartz. Some of the crystals have been found of very large size, as much as $3\frac{1}{2}$ x $5\frac{1}{2}$ inches, and built up to a thickness of 2 or 3 inches (Journ. Roy. Soc. N.S.W., p. 237, 1892); the outlines of such, however, are very imperfect, but amongst those in the present collection are some very well developed crystals (see plate viii. which shows the natural size), but of smaller size. The group (fig. 5) is a very interesting one, showing well marked hexagonal forms, with a nearly vertical

crystal rising from, and crossing the horizontal ones. In other cases the plates of molybdenite penetrate the crystals of quartz, and pass between the adjacent faces of the rock crystal. Some of the quartz crystals are cavernous, and have the vugs lined with small crystals of quartz, showing the usual combination of the prism and pyramid. In one specimen the molybdenite is seated on tinstone. From Kingsgate, Glen Innes, N.S.W.

Molybdenum ochre.

In the form of yellow patches consisting of felted acicular crystals. From Kingsgate, Glen Innes, N.S.W.

Enhydros, or Water Stones.

(Plates ix. x.)

No locality is given for these, but they so closely resemble those formerly found at Spring Creek, Beechworth, Victoria, that they in all probability come from that place. The specimens figured on plates ix. and x. are remarkable for their large size, the plates show them of their natural dimensions, except that plate x. is much foreshortened from *a* to *b*, being $7\frac{1}{8}$ inches in length instead of about $2\frac{7}{8}$ as shown. Plate ix. shows the hollow nature of these enhydros, where the ends having been broken off, the interior is thickly coated or lined with small pyramids of quartz crystals, the thicker one (plate x.) is also hollow, and each of the plates of which it is made up is likewise hollow or shows a tendency to form a cavity at the thicker parts; in some this is merely indicated by a crystalline structure. One of the enhydros, not figured, is attached to a lump of ordinary quartz. The outer surfaces of all of them are of very hard, smooth chalcedony, having a horny appearance and brownish colour, stained with iron oxide. The sp. gr. is 2·66, *i.e.* the usual sp. gr. of quartz. Hardness = 7·5. None of these three retained any liquid.

Mr. E. J. Dunn described the mode in which the enhydros occur at Spring Creek, in a paper read before the Royal Society of Victoria (Trans. R.S. of Vic., 1870, p. 32); they are found in a dyke in granite, the dyke is composed of fragments of granite and occasional pieces of sandstone cemented by crystallised quartz, together with large masses of coarse chalcedony and straight veins of chalcedony scales and clay. Mr. Dunn mentions that the enhydros vary in size from that of a split pea to five inches across, and that many of them contain a fluid; after a few days exposure they usually show an air bubble, in many the fluid disappears altogether in a few days; the walls of some are as thin as a sheet of paper and very fragile, while others have walls $\frac{1}{4}$ inch thick. On p. 71 of the same

volume is a paper upon them by Mr. G. Foord, describing the enhydros more in detail, and giving an account of the contained fluid, which he describes as a dilute solution in water of chlorides and sulphates of sodium, magnesium and calcium, together with silicic acid.

Some smaller specimens in my possession have a much more regular geometrical form than the three under examination and belonging to the Museum. At first sight they might be mistaken for crystals, so smooth and regular are their faces, but a very little examination shows that this is not the case, practically none of the faces are parallel, and their forms do not correspond to any crystallographic system. I am inclined to think that they have been deposited within cracks and cavities formed in the clay (in which they are found), these cavities are probably due to the movements of the clay, parts having slid upon one another in the process of settlement, and a breccia-like structure set up with intermediate gaps and cavities. Mr. Foord's explanation that the chalcedony and quartz crystals have been deposited upon the walls of the cavities until the entrances to the hollow spaces were filled up (a portion of the liquid being thereby imprisoned) appears to satisfy the requirements of the case.

ADDITIONS TO THE AVIFAUNAS OF TASMANIA, AND NORFOLK AND LORD HOWE ISLANDS.

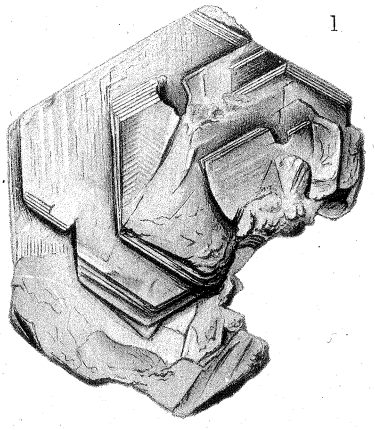
By Alfred J. North, F.L.S., Assistant in Ornithology.

During the last twelve months an unusually large number of rare or additional grallatorial and natatorial species have been obtained in these insular areas. It is my intention here to briefly note the latter. Why one season should be better than another for aquatic nomads or visitors to make their appearance almost simultaneously in places so widely separated as Lord Howe Island, Norfolk Island, and Santo in the New Hebrides is probably due to exceptionally fine weather and favourable climatic adventitious aids conducive to long and extended flight, and not, as frequently occurs with arboreal species driven to seek a place of refuge, through tempestuous weather.

EXPLANATION OF PLATE VIII.

Crystals of Molybdenite, Kingsgate, N.S.W.

Natural size.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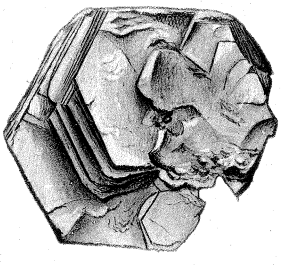
2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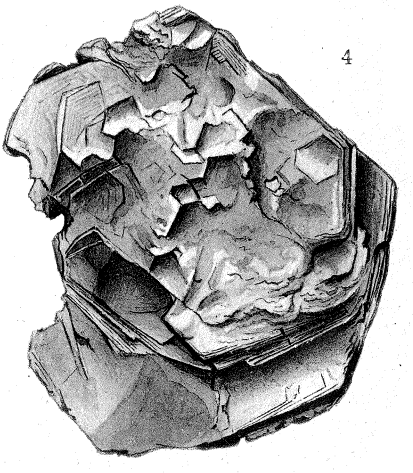
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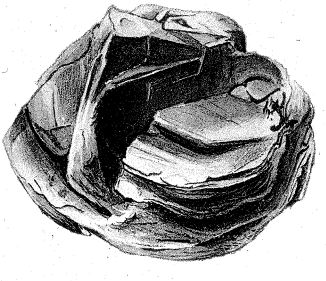
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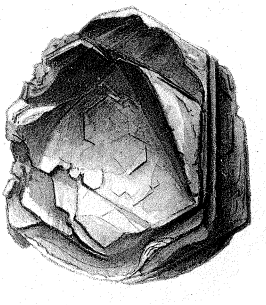
6

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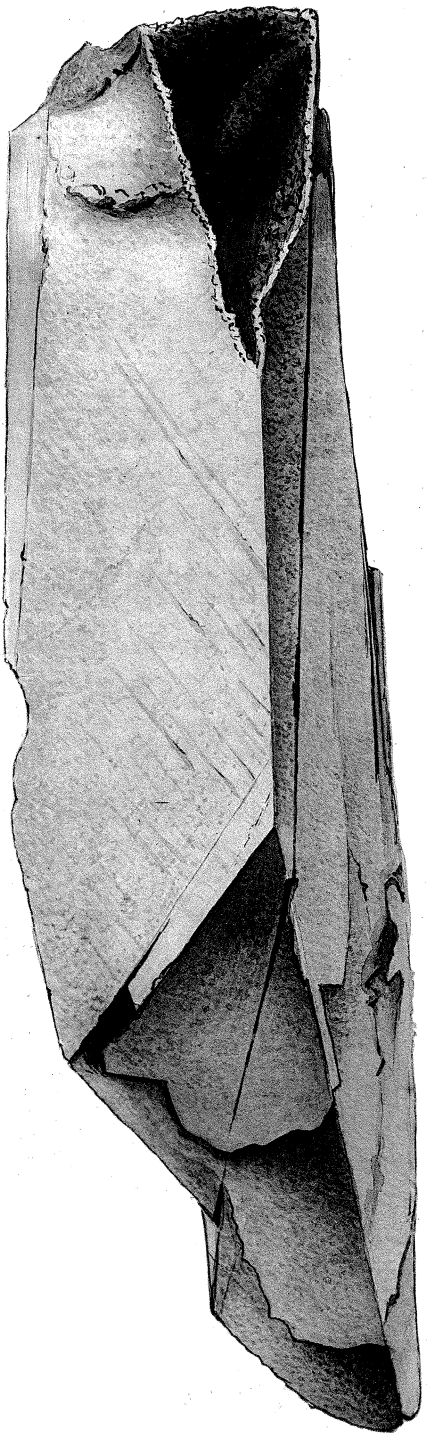
EXPLANATION OF PLATE IX.

ENHYDRO, OR WATER STONE.

Natural size.

Length, $7\frac{1}{2}$ inches; height, $2\frac{9}{10}$ inches; width, $2\frac{1}{10}$ inches.



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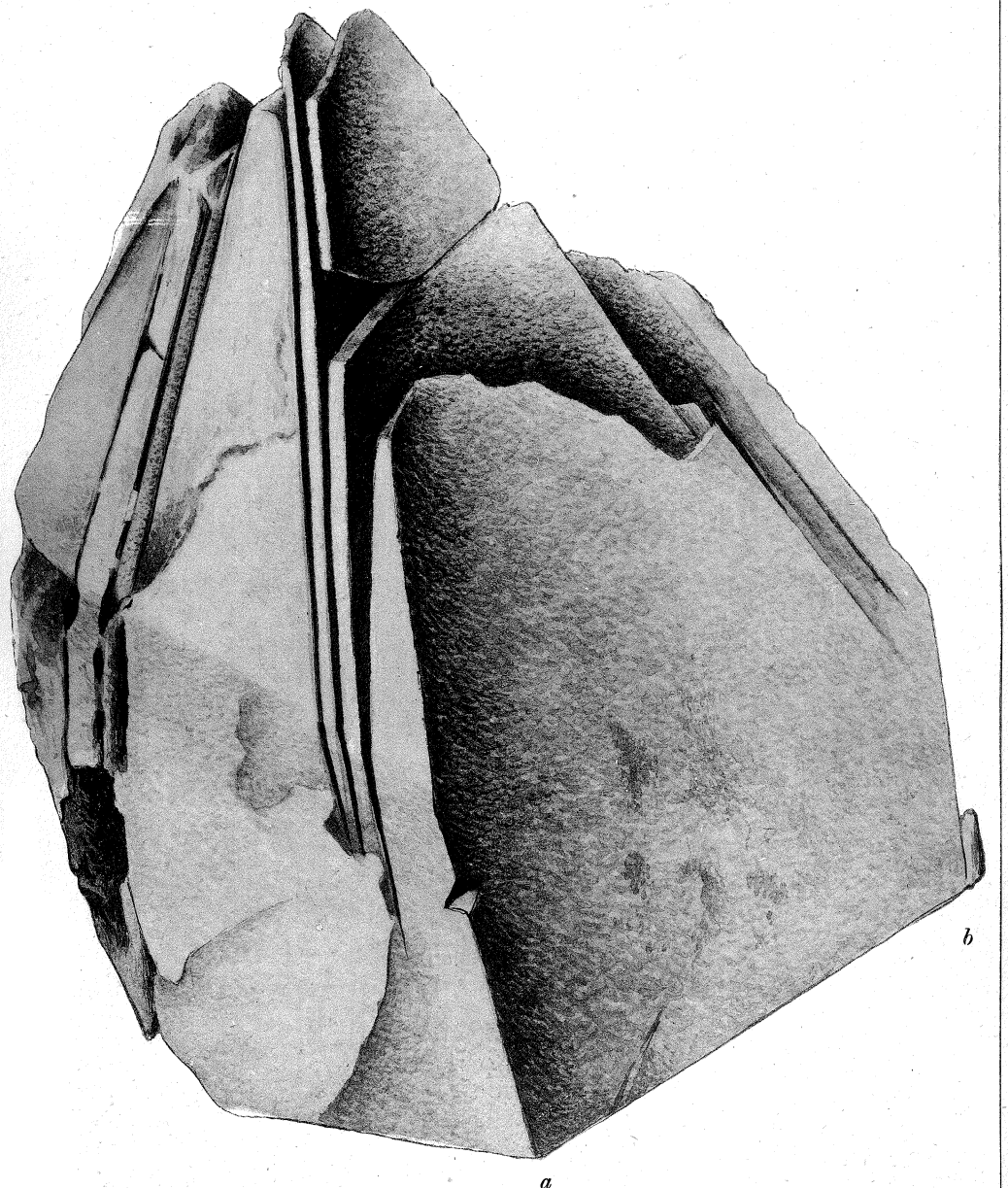
EXPLANATION OF PLATE X.

ENHYDRO, OR WATER STONE.

Natural size, foreshortened from *a* to *b*.

Length, from *a* to *b*, $7\frac{1}{2}$ inches; height $6\frac{2}{5}$ inches; width, $3\frac{3}{10}$ inches.



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