an eight-hour shift underground, excretion of vitamin C through sweat must play an important part in vitamin C subnutrition in miners, who cannot afford a liberal diet (20–25 mgm. vitamin C daily has been regarded as the indispensable minimum to prevent subscorbutic symptoms under normal conditions[4]).

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Hexaco-ordination of Tellurium, Molybdenum and Tungsten

THE Raman spectra of telluric acid and several molybdates and tungstates have been examined in the crystalline state and in aqueous solutions, particular care being taken to record their *complete* Raman spectra. Some of the results are given below:

Telluric acid solution—$\Delta\bar{\nu}$ 644(10), 619(1), 333(3).
Ammon. molybdate crystals—927(7), 881(4), 362(1), 223(2).
" " solution (ammoniacal—895(5), 820(2), 326(3).
Potass. " " (alkaline)—891(10), 823(3), 319(8).
Sodium tungstate " (alkaline)—929(5), 834(1), 320(3).
Potass. tungstate " (")—924(4), 835(1), 320(3).
(Figures in parenthesis indicate relative intensities, estimated visually).

In contrast with the results for sulphates[1] and selenates[2] (and of solid ammonium molybdate), the total number of Raman lines in each of the spectrograms of aqueous solutions is *three*, and *not* four, which is the number of lines expected from a tetrahedral molecule. On the other hand, the relation $\nu_1^2 = \nu_2^2 + \frac{3}{2}\nu_3^2$, which is the relation between the frequencies of an octahedral molecule, is strikingly obeyed, the deviations (2 per cent for molybdate; 0·1 per cent for tungstate) being very much less than what has been observed in some accepted octahedral molecules like the hexafluorides of sulphur, selenium and tellurium[3] (10–17 per cent). The intensity relations of the lines are also in agreement with an octahedral structure.

It is therefore concluded that, like telluric acid, the molybdates and tungstates, which are known from studies of the phase systems to exist at ordinary temperatures as dihydrates[4], are octahedral units in aqueous solutions, two oxygen atoms being co-ordinated to the central atom from the two water molecules of hydration.

A detailed discussion of the subject will be published elsewhere.

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Points from Foregoing Letters

DR. R. BROOM reports the discovery of a molar tooth having the characteristics of *Australopithecus* in a cave at Sterkfontein, South Africa, a few yards from the recently found skull belonging to the same species. The author gives diagrams comparing this tooth with the third right lower molar in allied anthropoid apes and in man, and submits a diagram of a possible relationship between man and the higher anthropoids.

By bombarding thorium with neutrons from a radium beryllium source, A. Braun, Dr. P. Preiswerk and P. Scherrer have detected alpha particles of energy greater than nine million electron volts, which they ascribe to the transformation of thorium of mass 232 into radium of mass 239.

The frequency of ionizing showers at sea-level and under the earth does not diminish with increased thickness of protecting lead, but tends to a limiting value. Dr. L. Landau and G. Rumer suggest that this is due to heavy particles which penetrate easily through lead. They submit a formula for the probability that a shower produced by a photon emitted by a heavy particle gets out of a layer of sufficient thickness, and this, they state, gives fair agreement with observed data.

Commenting on a previous communication by Prof. Wilson on nitrogen excretion by white and red clover and pea, Prof. A. I. Virtanen states that his experiments were carried out in very fine sand and in various soils approximating to natural conditions. He explains Prof. Wilson's failure to confirm the excretion as possibly due to the use of coarse quartz sand, which lacks absorptive capacity. A number of other factors, such as bacterial strain, amount of nodules, host plant, medium and nitrate content of the medium also affect the amount of nitrogen excreted. Dr. G. Bond now reports experiments with sand cultures of innoculated soybeans which failed to show that nitrogen is excreted from their root nodules. This may be due, he thinks, to lack of as yet undefined conditions necessary for excretion. A small excretion of nitrogen in the case of a pea culture was observed.

In connexion with the discussion on protective coloration in insects, J. J. S. Cornes submits a photograph of an Australian moth, *Venusia verriculata*, resting on a dead leaf of the palm-lily, *Cordyline australis*, with its wings so oriented that their brown parallel markings lie along the parallel veins of the dried palm leaf, which they match in colour. This position they always take up. Prof. G. D. Hale Carpenter recalls a similar phenomenon recorded by Mr. Hamm in the case of the common winter moth, *Hybernia leucophearia*, and another in the case of the African butterfly, *Eronia cleodora*.

The amount of vitamin C excreted in the sweat in the case of Bantu labourers working at a temperature of 96–97° F. in the Witwatersrand gold mines is 0·5–1·1 mgm. per 100 c.c., or about 2 milligrams per hour, according to R. E. Bernstein. This loss of vitamin C may account for the relative frequency of scurvy or sub-scurvy amongst those miners.

The Raman spectra of aqueous solutions of telluric acid and of several molybdates and tungstates show only three lines, and their characteristics indicate that these substances exist at ordinary temperature as dihydrates in octahedral units, two oxygen atoms being co-ordinated to the central atoms from the two water molecules of hydration.