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FOURTH SERIES.

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☞ With this, the regular Number for July 1864, is published, and should be delivered to Subscribers, the SUPPLEMENT (No. 185) to Vol. XXVII., containing papers by Prof. STUDER, Mr. A. CAYLEY, Dr. ATKINSON, M. E. JOCHMANN, Mr. C. TOMLINSON, Mr. W. GIBBS, together with *Proceedings of the Royal Society, Geological Society, Intelligence and Miscellaneous Articles*, and the *Title-page, Table of Contents*, and *Index* to Vol. XXVII.

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assume as it grows. And the process is substantially the same in animals and plants; both absorb, decompose, select, reject, and recombine. An animal may select what a tree rejects; but so also may one plant select what another rejects. None feed upon carbon or oxygen alone. Some are not satisfied without drawing their nutriment direct from the living plant or animal; many feed upon organic substances, in which the decomposition after death has scarcely commenced; and most, if not all, appear to require for their support some small portion, at least, of matter in which life is or has been. In both animals and vegetables the clock is wound up, and it runs down; in both, the atoms are separated and recombined, and, in both, these operations take place in a totally different way from what they do in the same bodies under the same influences, the moment life is extinct, the moment the vital power ceases to act. It is this vital power, its continuity and infinite divisibility, its unity and infinite diversity, the concordances, discrepancies, and reciprocal action and influences of the infinity of forms it produces, that our Society is specially called upon to investigate. As systematists, we have so to discriminate, describe, and class these forms as to enable us readily to identify them, both individually and collectively, to comprehend one another and ourselves in treating of them, and to retain and store in our minds and books what is known of their resemblances, differences, and peculiarities, of their influences and relations to each other and to the lifeless world, as a starting-point for future observation. As biologists, we have to study life itself in all its phases, and the multifarious influences by which it is continued, preserved, multiplied, checked, injured, destroyed, or extinguished. But, in addition, we must not neglect to learn from natural philosophers what are those general forces which act on organic as well as on inorganic bodies, and whilst carefully watching every modification these forces undergo, when applied in combination with vital power, gratefully accept any proved identity of action in the living and inanimate world.

ANALYSIS OF LANGITE, A NEW MINERAL FROM CORNWALL.

BY M. PISANI.

Professor Maskelyne presented a short time ago to the Geological Society of London some specimens of a new mineral found in Cornwall, to which he has given the name *Langite*. It is a greenish-blue hydrated subsulphate of copper, forming crystalline crusts and small right rhomboidal prisms on a coarse argillaceous schist called *killas* in Cornwall.

The crystals of Langite are small and short; by their union they form macles analogous to those of Arragonite. Translucid; lustre vitreous. Its colour is a beautiful greenish blue, and that of its powder a pale blue. Hardness, 3·5; specific gravity about 3·05. Heated in a test-tube it gives water. Before the blowpipe, on charcoal, it gives with soda a bead of copper. It is insoluble in water, but soluble in weak acids and ammonia. Its hydrochloric acid solution,

when diluted, gives an abundant precipitate with chloride of barium. It differs from brochantite in containing more water; therefore, as its external aspect is also quite different, it deserves to form a separate species. It is to be noticed that Berthier formerly analyzed an amorphous brochantite from Mexico, in which he had found as much water as in Langite, while its colour was green like that of other brochantites.

Langite gave on analysis—

		Oxygen.		Ratios.
Sulphuric acid	16·77	10·0		3
Oxide of copper . ..	65·92	13·3		
Lime.....	0·83	0·2	13·6	4
Magnesia.....	0·29	0·1		
Water	16·19	14·4		4
	100·00			

which corresponds to the formula

$$4\,CuO,\,SO^3+4\,HO.$$

This formula requires—

Sulphuric acid	17·06
Oxide of copper	67·59
Water	15·35
	100·00

It thus only differs from brochantite by containing one more equivalent of water.—*Comptes Rendus*, October 10, 1864.

ON THE HISTORY OF ENERGETICS.

To the Editors of the Philosophical Magazine and Journal.

University of Glasgow,
October 5, 1864.

Gentlemen,

So far as I know, the earliest introduction of a distinct term to denote the *mechanical* form of what is now called "potential energy" is due to Carnot, who, in a scarce and little-known essay on Machines in general, uses the phrase "*force vive virtuelle*" in that sense.

The step which I took in 1853, of applying the distinction between "Actual Energy" and "Potential Energy," not to motion and mechanical power alone, but to all kinds of physical phenomena, was suggested to me, I think, by Aristotle's use of the words δύναμις and ἐνέργεια.

I am, Gentlemen,

Your most obedient Servant,

W. J. Macquorn Rankine.

Erratum in October Number.

In Prof. Rankine's paper on Stream-lines, Equation II.,

$$\text{for } -\frac{db}{dy} \text{ read } -\frac{db}{dx}.$$