LX. On a peculiar method of obtaining the sesqui-ferrocyanide of potassium

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$$P = \frac{SC_1}{V} \left\{ \beta - D + C_1 - \sqrt{(\beta - D + C_1)^2 - \frac{\tau}{t} \left[\frac{K}{k_1} (\alpha - D) \right.} \right. \\ \left. \left. (\beta - D)^4 + (\beta - D + C_1)^2 - \frac{(\alpha - D)(\beta - D)^4}{(\alpha - D + C_1)(\beta - D + C_1)^2} \right] \right\}, \quad (19.)$$

substituting for μ its value SC_1 , S being the surface of the land.

In the above formula, and the first of the two equations expressing the value of C_2 , we have used for brevity the letters k , k_1 and K , for the following expressions:—

$$k = \frac{8}{15} \pi, \quad k_1 = \frac{8}{15} \pi (\alpha - D + C_1) (\beta - D + C_1)^2, \\ K = \frac{6912}{1875 \pi^2} \left\{ \left(\frac{25}{36} \pi^2 - 2 \right) \cot \frac{5}{6} \pi + \frac{2}{\sin \frac{5}{6} \pi} - \frac{5}{3} \pi \right\}.$$

If we assume that the mean height of the land above the level of the sea is equal to the mean depth of the ocean, and for the value of the latter two miles, the surface of the sea twice that of the dry land, and the density of the water half that of the land, the value of C_1 will evidently be two miles. A value of V not very inconsistent with observation would be half a mile; those of α and β are obtained from Mr. Airy's treatise on the Figure of the Earth. We have made

$\tau = \frac{1}{1000}$ of a second, as it has been shown that if the length

of the day had varied since the time of Hipparchus by the one-three-thousandth part of a second, the value of the secular equation of the moon would be changed by more than $4''$.

The sidereal day being represented by t , it follows that $\frac{\tau}{t}$

$= \frac{1}{86400000}$. The value of P calculated from these data will be less than five feet multiplied into the area of all the dry land.

The amount of denudation of the earth's surface represented by the above quantity appears to be within the limits which can be assigned by geological observations.

Dublin, July 9, 1845.

LX. On a Peculiar Method of obtaining the Sesqui-ferrocyanide of Potassium. By Prof. SCHÖNBEIN, of Basle*.

MY experiments on ozone have shown that this substance, like chlorine, is capable of transforming the yellow ferrocyanide of potassium into the red one. The other day

* Communicated by the Author.

I made use of this property with the view of preparing a comparatively considerable quantity of the last-named salt. To arrive at this end, I put into each of twelve large balloons filled with atmospheric air a piece of pure phosphorus, an inch long, in such a manner that half of the bulk of the pieces of phosphorus was immersed in water, whilst the other half was exposed to the action of the ambient air. I left the whole to itself at a temperature of 70° F. for about twelve hours, after which time the atmospheres of the vessels appeared to be so much charged with ozone, that their smell resembled that of chlorine; paste of starch containing some iodide of potassium became instantaneously black in them, litmus paper was bleached within a few minutes, &c.

Things being in this state, the acid was carefully removed from the balloons by rinsing them with distilled water, and then an aqueous solution of the yellow prussiate was poured into one of the vessels. I need not say, that in shaking the solution with the ozonized atmosphere of the balloon, the odoriferous principle disappeared almost instantaneously. After the ozone had been entirely taken up, the solution was transferred to a second balloon and shaken; from thence poured into a third vessel, and so on until ozone acted no further upon the liquid, or what comes to the same thing, until the solution no longer yielded prussian blue with nitrate of peroxide of iron. The solution, on being now sufficiently evaporated, yielded most beautiful crystals of the red cyanide. It is worth while to state here, that under the circumstances mentioned so much ozone had been developed, that the ozonized air of two balloons was sufficient to transform completely 5 grammes of the yellow crystallized salt into the sesqui-cyanide. The formation of this compound depending upon the elimination of part of the potassium contained in the yellow prussiate, it follows that besides the red cyanide another alkaline substance must be formed. What that compound is, I am not yet prepared to say, but I have reasons which make me inclined to believe that ozone combines with some potassium, changing the latter into a peculiar peroxide of that metal soluble in water and able to co-exist with the red cyanide. Those reasons are, that the solution of the yellow cyanide, after having been decomposed by ozone, exhibits a much stronger alkaline reaction than the yellow salt does; and that the said solution, by being acidulated with dilute sulphuric acid, colours deeply the paste of starch containing iodide of potassium. It is a remarkable fact, which I ascertained many years ago, that peroxide of lead or of manganese acts in the same manner upon a solution of the yellow cyanide as ozone

Phil. Mag. S. 3. Vol. 27. No. 181. Nov. 1845. 2 C

does. That circumstance seems to speak in favour of the supposition of ozone and peroxide of lead being similarly constituted.

Before concluding this notice, I must not omit to remark, that according to my experiments the methods which yield ozone more abundantly than any other hitherto made use of, consists in exposing clean phosphorus to the action of stagnant air and water at a temperature of 70°–80° F. M. Marignac and some other chemists, with a view of producing ozone as abundantly and easily as possible, caused a continuous current of air to pass over phosphorus; but how imperfect that method is, appears from the fact, that the distinguished chemist of Geneva procured with his apparatus, working night and day for four weeks, no more ozone than was just sufficient to decompose 2 grammes of iodide of potassium. It seems that the presence of some ozone in the atmospheric air favours very much the formation of that substance, and probably accounts for so little ozone being obtained by Marignac's method.

LXI. On the Nature of Ozone.

By Prof. C. F. SCHÖNBEIN of Basle*.

THE properties of ozone, and the circumstances under which that remarkable substance is produced, render it highly probable that ozone is a peculiar peroxide of hydrogen. MM. De la Rive and Marignac have lately ascertained the highly interesting fact, that dry oxygen, on being exposed to the action of electrical sparks, yields ozone; and from this fact the philosophers of Geneva have drawn the conclusion, that ozone is nothing but oxygen brought into a peculiar condition by the agency of electricity. Simple and well-founded as that inference seems to be, it is nevertheless so extraordinary that I cannot help making a remark or two on the subject.

It has very often been asserted that electricity is capable of modifying the chemical properties of elementary substances, for instance, the degree of the oxidability of metals, &c. As far as I know, there is however not one single fact known that proves the correctness of the assertion in a satisfactory manner, for what is called the passive state of some metals brought about by voltaic currents, or the protection of metals effected by voltaic means, are phænomena referable to other than electrical causes. As far as our knowledge goes regarding the influence exerted by electricity upon simple bodies, it does not, to my apprehension, entitle us to admit that their chemical properties are in the least altered by electricity; on the contrary,

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