Tables for the Analysis of a Simple Salt. By A. Vinter, M.A. (London: Longmans and Co., 1880).

MANY tables for the qualitative analysis of simple salts already exist; another set is just added to the list by Mr. A. Vinter. It is very probable that students who—like those for whom Mr. Vinter's tables are arranged- can only devote one hour a week to practical chemistry, would do well to add that hour to those allotted to some other study; but if school-teachers will give their boys so insignificant a smattering of practical chemistry, these tables will, we think, be found useful and generally accurate so far as they go, which is certainly but a very little way indeed.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The late Count L. F. de Pourtales

EVERY naturalist must have noticed with regret the news of the death of M. de Pourtales, of Cambridge, Mass., U.S., but those who have had the pleasure of his friendship and who have been fellow-labourers with him feel a most sincere sorrow at the loss which science has sustained.

The exploration of the deep sea brought Pourtales prominently before the scientific world, and his practical knowledge of the art of dredging not only produced results which were of great importance to Alexander Agassiz and Lyman, but they also provided him with a wonderful series of deep-sea corals, upon which he laboured with great success. The floor of the Gulf Stream in the Straits of Florida, the dredgings of the *Hassler* Expedition, and lastly, the examination of the results of the work done in the Caribbean Sea during the voyage of the U.S. steamer *Blake*, gave the opportunity, which was readily seized and utilised, of contributing largely and thoroughly to the knowledge of the interesting Madreporarian fauna of the depths. I can testify to the solid merit of the work done by my friend, and I can never forget his generous assistance, kindly criticisms, and desire to obtain the perfect truth. He spared no pains, and was ever at work in the difficult subject he especially chose; and he speedily grasped the relations of the past and present deep-sea coral faunas, and, besides adding largely to our knowledge of forms, contributed in a most important manner to the study of the generic and specific value of certain structures. Of his knowledge of the Crinoidea I need not write, but of the great value of the researches of the grave, courteous, and most genial man who is no longer amongst us I shall ever speak in terms of great admiration and gratitude.

Athenæum, August 8 P. MARTIN DUNCAN

The Recent Gas Explosion

ACCORDING to promise, I write to describe the continuation of the experiments on the above subject.

At present there is little else than failure to report, but as I am leaving home to-day and shall not be able to try any additional experiments for the next three or four weeks, I will merely mention the results obtained.

A piece of composition gas-pipe 10m. long, 15mm. internal diameter, and 2 mm. thick, was filled with a mixture of 2 vols. of hydrogen to 1 vol. of oxygen, and the gas exploded. The tube was not affected, the cork which closed it being projected.

It was then filled with a mixture of 10 volumes of coal-gas and 12 of oxygen, and in this case the tube withstood the explosion; a piece of india-rubber tube covered with calico tightly bound round it, which was used to connect the farther end of the tube to a metal stopcock, was however burst and the calico torn.

To-day I tried a tube made of paper. The tube is 7 mm. in diameter, and consists of eight layers of thin paper, stuck together with paste, and varnished on the outside with shellac.

This I have not succeeded in bursting with the mixture of hydrogen and oxygen; one of the caoutchouc stoppers which closed the glass tubes cemented to the end of the paper tube was blown off.

I hope to repeat the experiment with another paper tube which is not so strong. HERBERT MCLEOD

Cooper's Hill, August 9

Heat of the Comstock Lode

IN May, 1878, Mr. Church, who was at that time Professor of Mining at the University of Ohio, read a paper before the American Institute of Mining Engineers on the heat of the Comstock mines, which was subsequently, in an extended form, included in the author's volume on the Comstock lode, of which a review appeared in NATURE (vol. xxi. p. 511).

In this paper Mr. Church states that the temperature of the waters issuing from the mines worked upon the Comstock lode has always been somewhat high, but it was not until they had attained a very considerable depth below the surface that the workmen first became inconvenienced by extraordinary heat. At their present greatest depth (about 2,700 feet) water issues from the rock at a temperature of 157° F. (70° C.), and at least 4,200,000 tons of water are annually pumped from the workings at a temperature of 135° F. Mr. Church estimates that to elevate such a large volume of water from the mean temperature of the atmosphere to that which it attains in the mines would require 47,700 tons of coal. In addition to this, the calculates, 7,859 tons of coal would be required to supply the heat absorbed by the air passing along the various shafts and galleries through which it is diverted for the purposes of ventilation. It follows that to develop the total amount of heat necessary to raise the water and air circulating in these mines from the mean temperature of the atmosphere to that which they respectively attain, 55,560 tons of coal, or 97,700 cords of firewood would be annually required.

Mr. Church, in his paper, quotes four analyses of waters from the Comstock lode taken at different depths; these vary somewhat as to the relative proportions of the various substances present, but they contain on an average 42·62 grains of solid matter to the gallon. Of this amount 20·74 grains are calcic sulphate, 12·13 grains carbonate of potassium, 4·85 grains carbonate of sodium, and ·66 grain of chloride of sodium.

In order to ascertain approximately to what extent the production of the large amount of heat absorbed by the water may be ascribed to oxidation of sulphur and iron, the author first calculates the quantity which would be developed by the oxidation of pyrites equivalent to the calcic sulphate in solution. But having found that this amounts to only about $\frac{1}{16}$th part of that required, he seeks another solution for the difficulty, and without any calculations in support of the hypothesis, attributes this enormous development of heat to the kaolinisation of felspar in the subjacent rocks.

In a communication to the Geological Society of London, published in their *Quarterly Journal*, August 1879, entitled, "A Contribution to the History of Mineral Veins," I endeavoured to show that the kaolinisation of felspars is as inadequate to produce the effects observed as is the oxidation of pyrites, and a recent paper read by Mr. Church before the American Institute of Mining Engineers, as well as his letter on Subterranean Kaolinisation in last week's NATURE, have been written with a view of answering these objections.

In my communication to the Geological Society I applied to the kaolinisation of felspars a similar line of reasoning to that adopted by Mr. Church with regard to the oxidation of pyrites.

The average proportion of alkalies contained in the rocks of the district is 6·40 per cent., while the mean of the published analyses gives 11·30 grains of alkalies in the U.S. gallon of water. It follows that the 4,200,000 tons of water annually pumped out must contain 813 tons of alkalies, and that, as these are present in the rocks in the proportion of 6·40 per cent., the felspar in 12,703 tons of rock must be annually kaolinised and the alkalies removed in solution.

The amount of rock in which the felspar has been kaolinised being 12,703 tons, and the number of tons of water pumped out of the mines 4,200,000, it follows that $\frac{4,200,000}{12,700} = 330$ is the number of tons of water heated by each ton of completely altered rock.

In order, therefore, that one ton of rock should be enabled to heat 330 tons of water only 1° Fahr., and the specific heat of these rocks be taken at ·1477, that of blast-furnace slags, it would require to be heated by the kaolinisation of its felspar to a temperature above that of molten gold. Consequently to raise the water 85°, or to a temperature of 135°, at which it issues, the