On the structure and relations of cornulites and other silurian fossils

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tained moreover peroxide of iron, lime and magnesia; a portion of the two latter still remained to be estimated in the ammoniacal filtered liquor. The three above analyses, the third of which yielded the best results, afforded the following proportions:—

	I.	II.	III.
Silicic acid			2·68
Phosphoric acid	41·89	40·23	39·56
Magnesia	42·04	38·49	45·07
Lime	1·65	4·40	2·32
Protoxide of iron ..	2·72	3·31	4·47
Alumina	0·55	0·96	
Fluorine			9·12
			<hr/> 103·22

The silicic acid is merely mixed with the wagnerite in the form of quartz, it must therefore be deducted. The same holds good with the alumina and small quantities of the remaining bases, which are combined with carbonic acid, forming calcareous and bitter spar, and cannot be completely removed in selecting the fragments. Their amount is however very inconsiderable. If we deduct the 2·68 per cent. of silica there remain 40·61 per cent. phosphoric acid, 46·27 magnesia, 4·59 protoxide of iron, 2·38 lime, 9·36 fluorine; results which do not differ to any extent from those of Fuchs except in the proportion of fluorine. If we calculate from the third analysis, we find that the quantities of protoxide of iron and lime, which nearly replace one part of magnesia, amount to one equivalent for 4·43 of the latter. Now 9·36 fluorine to form MgFl require 6·34 $\text{Mg} = 10·34$ magnesia; consequently 40·36 per cent. of magnesia remain to combine with the 40·61 per cent. phosphoric acid. But as the above experiment could hardly yield the entire amount of phosphoric acid and of fluorine, we have no hesitation in regarding the magnesian phosphate as $3\text{MgO}, \text{P}_2\text{O}_5$, assigning to wagnerite the formula $\text{MgFl} + 3\text{MgO}, \text{P}_2\text{O}_5$. This formula requires 43·32 per cent. of phosphoric acid and 11·35 per cent. of fluorine, whilst the formula $\text{MgFl} + 4\text{MgO}, \text{P}_2\text{O}_5$ requires only 38·5 phosphoric acid, thus less than the experiment yields, and 55·73 magnesia; it is therefore incorrect.

In the specimens of the wagnerite selected for analysis, there were reddish, dull, and soft portions, the examination of which showed that they were probably decomposed wagnerite; they consisted principally of silicic acid. On analysis they yielded 93·81 per cent. silicic acid, 1·87 phosphoric acid, 1·41 alumina and peroxide of iron, 2·58 lime, and 1·49 magnesia.—*Poggendorff's Ann.* lxiv. p. 251.

[To be continued.]

ON THE STRUCTURE AND RELATIONS OF CORNULITES AND OTHER SILURIAN FOSSILS. BY MR. J. W. SALTER.

The singular fossil named *Cornulites serpularius* is well known as characteristic of the Silurian rocks of Gothland, Britain and North America, and its affinities have been the subject of much conjecture.

Mr. Salter's investigations proved that it differed essentially from any crinoidal animal or coral, and was most probably an ancient form of the *Serpulinae*. From a similarity of structure in the *Tentaculites*, another abundant fossil of the Silurian rocks, Mr. Salter is disposed to refer it to the same group with *Cornulites*.—*Proc. Brit. Assoc. Cambridge*, June 19.

ERUPTION OF VESUVIUS.

Letters from Naples announce, that the expected eruption of Mount Vesuvius has commenced. At their date, the volcano had been for several days throwing up flames and stones, by the mouth of the cone formed some months ago in the midst of the crater; and the burning lava had opened a wide passage below, and was flowing down the side of the mountain.

METEOROLOGICAL OBSERVATIONS FOR JUNE 1845.

Chiswick.—June 1. Overcast and fine. 2. Very fine: sultry. 3. Sultry: rain at night. 4. Showery. 5. Slight rain: cloudy; boisterous at night. 6. Cloudy and windy. 7. Very fine: showery, and boisterous at night. 8. Boisterous: clear and fine. 9. Very fine. 10—12. Very fine: sultry: clear and fine at nights. 13. Foggy: sultry. 14, 15. Very hot and sultry. 16. Overcast. 17. Sultry. 18. Rain: clear at night. 19. Hazy: very fine. 20. Cloudless: very fine. 21—23. Very fine. 24. Uniformly overcast: heavy rain: clear. 25. Cold and dry: cloudy: rain. 26. Cloudy: fine. 27. Rain. 28. Overcast: heavy showers: clear. 29. Very fine. 30. Slight rain: very fine.—Mean temperature of the month $11\frac{1}{2}^{\circ}$ above the average.

Boston.—June 1. Rain: rain early A.M.: rain A.M. 2. Fine. 3. Fine: 2 o'clock P.M. thermometer 72° : rain P.M. 4. Fine: thunder and lightning, with rain P.M. 5. Cloudy: rain early A.M. 6. Windy. 7. Fine: rain P.M. 8. Cloudy. 9. Fine. 10. Fine: 3 o'clock P.M. thermometer 74° . 11. Fine: 1 o'clock P.M. thermometer 75° . 12. Fine: 4 o'clock P.M. thermometer 76° . 13. Fine: 1 o'clock P.M. thermometer 78° . 14. Fine: 12 o'clock noon thermometer 78° . 15. Cloudy. 16. Cloudy: 1 o'clock P.M. thermometer 78° . 17. Fine. 18. Cloudy: rain early A.M.: rain A.M. and P.M. 19. Fine. 20. Cloudy. 21. Fine. 22. Cloudy. 23. Fine. 24. Fine: rain, with thunder and lightning P.M. 25. Cloudy. 26. Fine. 27. Cloudy: rain A.M. and P.M. 28. Cloudy: rain A.M.: thunder and lightning 1 P.M. 29. Fine. 30. Fine: rain early A.M.—N.B. The warmest June since June 1826.

Sandwich Manse, Orkney.—June 1. Cloudy. 2. Cloudy: clear. 3. Bright: cloudy. 4. Showers. 5. Bright: showers. 6. Bright: drops. 7. Clear: fine. 8. Drops: rain: clear. 9. Drops: cloudy. 10. Bright: damp. 11, 12. Bright: cloudy. 13. Bright: clear. 14. Damp: cloudy: fine. 15. Cloudy: rain. 16. Fog. 17. Bright: damp. 18. Rain: damp. 19. Bright: clear. 20. Bright: damp. 21. Cloudy. 22. Showers: cloudy. 23. Bright: cloudy. 24. Damp: fine. 25. Bright: showers: cloudy. 26. Rain: damp. 27. Showers. 28. Cloudy: showers. 29. Showers: clear. 30. Cloudy: clear.

Applegarth Manse, Dumfriesshire.—June 1. Fine soft rain. 2. Very fine: fair. 3. Fine rain. 4. Showers all day. 5. Rain continued. 6. Rain. 7. Soft showers. 8. Heavy rain A.M.: fair P.M. 9. Showers. 10. Fair and growing. 11—14. Very fine summer day. 15. Very fine summer day: thunder: a few drops of rain. 16. Showery all day. 17. Slight showers. 18. Slight showers P.M. 19, 20. Fair and fine. 21. Fair and fine: a few drops: rain. 22. Fair and fine: very dry. 23. Fine: one slight shower. 24. Rain, very heavy. 25. Showers. 26. Fair and fine. 27. Rain: wind: thunder. 28. Fair and clear. 29. Fair A.M.: shower P.M. 30. Showers.

Mean temperature of the month $56^{\circ}55$
Mean temperature of June 1844 $55^{\circ}10$