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XXXIV. *On the Affinity of some Fossil Scales of Fish from the Lancashire Coal Measures with those of the recent Salmonidæ.*
By W. C. WILLIAMSON, Esq., Curator to the Manchester Natural History Society*.

[With Figures: Plate II.]

IN examining the roofstone of the black and white coal at Peel near Worsley, I was fortunate enough to meet with remains of fish, of a character sufficiently interesting to merit this brief notice. This coal occupies a position about a thousand yards from the top of the carboniferous series, and at Peel presents in its immediate vicinity the following section:

	Metal, 15 yards.	Ft.	In.
Coal	7	0
	Metal, 4 yards.		
	White sandstone, 35 yards.		
	Metal, 44 yards.		
"White" coal	2	5
	Clay, one to seven yards.		
"Black" coal	2	5

The shale in which the fish occur rests immediately upon the "white coal." It is very compact, bituminous, and well calculated for the preservation of minute characters. In this shale I have already detected at least four species, belonging to as many distinct genera, but at present would only call the attention of ichthyologists to one, scales of which magnified to thrice their natural size, are represented by the sketches (Pl. II.) figs. 4, 5, and 6. I have met with several specimens of the fish to which they belong, but all are more or less in a crushed condition. The scales vary in form from being nearly circular to an oblong rhomboid, and on examining the scales of recent Salmonidæ, I found that they had the same general forms. A more minute examination exhibited a strong resemblance in the arrangement of the cycloid striæ, which are nearly as distinct in the fossil as in the recent species, especially on the inferior surface of the scale, part of which is represented at fig. 5.

Fig. 1, 2, and 3 exhibit scales of the common salmon (after the pearly enamel is removed) magnified to the same degree as the fossil ones.

The only specimen I have yet found showing all the fins is about 4 inches long. The head is crushed, but the body and tail are nearly perfect. The anterior dorsal and the ven-

* Communicated by the Author.

tral fins are placed opposite each other, as also are the anal and what appears to be the posterior dorsal. Here a discrepancy exists. In recent Salmonidæ, the latter fin is merely a fleshy appendage, and not supported by rays. In the fossil specimen the fin, though imperfect, exhibits traces of true rays. Though this will prevent its being considered one of the Salmonidæ, I know none other of the abdominal Malacopterygii that have the same arrangement of the fins: this fact, combined with the resemblance between the scales, which differ only in the existence of radiating striæ at one extremity of the fossil, which do not exist on the recent ones, seems to indicate a close affinity. The discovery of more complete specimens may throw new light upon their nature.

XXXV. *Analyses of the Hydrates of Baryta and Strontia.*
By H. M. NOAD, Esq., *Lecturer on Chemistry.*

To the Editors of the Philosophical Magazine and Journal.

GENTLEMEN,

ON looking over some of the back Numbers of your Magazine, which have only lately come into my hands, I met with a paper by Mr. J. D. Smith on the hydrates of barytes and strontia, in which he seems to think that the previous determination of the quantity of water combined with these metallic oxides, by Mr. Phillips, is not correct. On referring to my journal, I found the results of an analysis of these hydrates by myself performed about two years ago, and having some crystals of each at the bottom of two bottles in which they had remained since that time, I determined to analyse them again, with the greatest care, as my results did not exactly correspond with those of Mr. Smith. As my recent experiments coincide exactly with my former ones, perhaps you will allow them to be inserted in your Journal, for the inspection of Mr. Smith and others. I must observe that the greatest care was taken to get the crystals perfectly dry by pressure between folds of blotting-paper.

	Bar.	Sulph. of Bar.	Bar.	Water.
Exp. 1.	37.5	gave 26.75	= 17.56	+ 19.94
Exp. 2.	30.	gave 21.5	= 14.11	+ 15.89
Exp. 3.	26.	gave 18.62	= 12.22	+ 13.78
			<hr/>	<hr/>
			43.89	49.61

or 76.7 one equivalent of baryta combined with 86.69 nearly $9\frac{3}{4}$ equivalents of water.