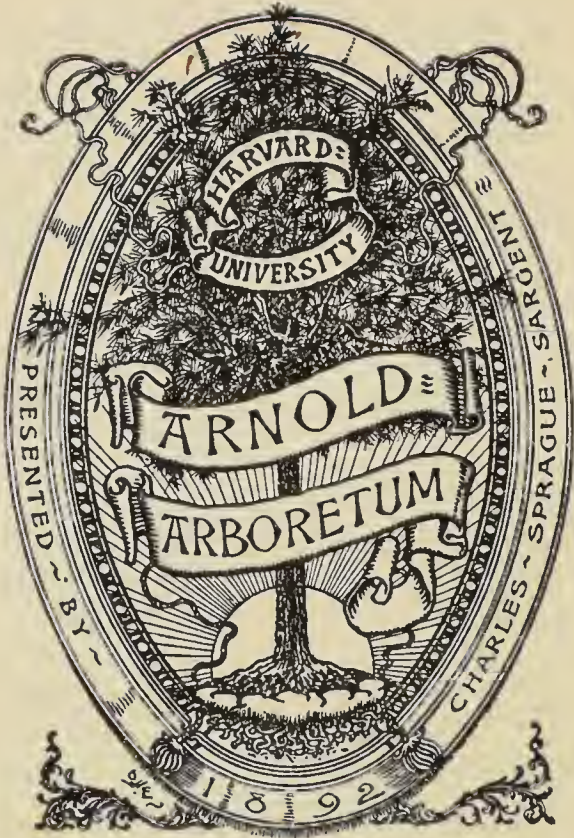


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RECENT DISCOVERIES

OF

CARBONIFEROUS VEGETATION

IN YORKSHIRE.

S. A. ADAMSON, F.G.S.,

LEEDS:

PRINTED BY RICHARD CROSLAND, 69, WOODHOUSE LANE.

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MR. S. A. ADAMSON, F.G.S.,

ON

“RECENT DISCOVERIES

OF

Carboniferous Vegetation in Yorkshire.”

THIS is a brief review of the discoveries of the fossil trees which have during the past year directed so much attention to the lower coal measures of Yorkshire. The first example was discovered by Messrs. Murgatroyd and Sons in their large quarry at Fall Top, Clayton, near Bradford, and these gentlemen deserve the highest praise from all geologists for the care used in revealing this magnificent specimen. Messrs. Murgatroyd (as they told the writer) have acquired a taste for geology by reading the geological paragraphs which appear from time to time in the *Leeds Mercury Weekly Supplement*, and hence they are now on the alert for objects of this nature, which formerly had no value whatever in their eyes. This quarry is not far from the edge of a bold escarpment overlooking the Thornton Valley, and the famous bed of stone, which we in this part know so well as the Elland flagstone, is worked here for landings, flags, &c. In the neighbourhood of Queensbury and Clayton, the beds, in descending order, are the Better bed coal, then some thirty feet of irregularly bedded and ragged sandstone, then follows some forty feet of shale, and finally the lower flagstone, which is of great thickness. It was in the measures above the lower flagstone, and at a distance of about twelve feet from the surface, that this fossil tree was discovered. The stump of the tree was embedded in a soft sandy shale, locally termed “yellow loam,” the roots resting on a bed of soft blue shale. The upper sandstones and shales just referred to are of little commercial value, the rag being used for rough walling, the remainder being merely rubbish to fill up other excavations. Thus in order to arrive

without much delay at the marketable lower flagstone, blasting operations have to be resorted to. After one of these explosions the proprietors observed part of a large fossil tree exposed, and with praiseworthy thoughtfulness they immediately suspended further operations, and instead gave orders to their workmen to carefully bare the remainder of the roots. Part of the stump and four of the roots were somewhat damaged by the explosion, but four roots were left *in situ*. Messrs. Murgatroyd collected the broken pieces, and placed them together most admirably, which then presented the remarkable sight of a colossal stump of sigillaria, sending out eight forked stigmarian roots. The proprietors then kindly issued invitations to view the fossil, which were accepted by geologists far and wide, among them being the famous Professor Williamson, who declared it to be probably the most magnificent specimen of a *Stigmaria ficoides* yet seen. The following dimensions, carefully measured by Mr. C. Brownridge, F.G.S., assisted by the proprietors, will afford an idea of the magnitude of this fossil:—

Height of Stump	...	...	...	...	Ft. in.	3	9
Diameter of Stump (longest axis)	...	...	...	...	Ft. in.	4	6
Do. (at right angles to longest axis)	...	...	...	...	Ft. in.	3	10
Root No.	Diameter close to stump.	Distance from bifurcation of roots.	Distance from point of bifurcation to present termination of root.	Right fork.	Left fork.	Greatest length of root.	
	Inches.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	
1	21	4 0	9 6	13 0	17 0		
2	17½	4 0	8 0	6 6	12 0		
3	16	5 0	7 0	4 0	12 0		
4	16	4 0	2 0	4 6	8 0		
5	17½	7 0	1 6	3 0	10 0		
6	18	5 6	3 0	4 6	10 0		
7	17	7 6	3 0	2 0	10 6		
8	17	7 0	9 6	7 0	16 6		

The diameter of the visible area covered by the ramifications of the roots was from north to south twenty-nine feet six inches, and from east to west twenty-eight feet, giving a superficial area exposed of eight hundred and twenty-six feet. The roots seven and eight, and also the roots one and two, respectively cross each other, producing depressions in the lower roots at the point of contact. The roots presented very finely the pits or scars characteristic of *Stigmaria ficoides*, from which the rootlets or filaments formerly originated, and an examination of the shale immediately round the roots revealed these rootlets in vast numbers. It is satisfactory to know that this

splendid example did not suffer the usual fate of these specimens by being broken up for roekeries; but was eventually purchased by Professor Williamson for Owen's College, Manchester, where it now is. When removed from its bed, it was found to weigh about five tons—truly a startling weight for a single specimen of a Yorkshire carboniferous fossil. It may be said that this was the fossil which the writer had the honour to describe in a paper read before the Geological Section of the British Association at the meeting in September, 1886, at Birmingham. The paper was well received, and the discovery was much appreciated by the President of the Association (Sir Wm. Dawson), Dr. Woodward (British Museum), Professors Williamson, Hull, Lebour, Lapworth, and other eminent geologists. Dr. Woodward was pleased to say that, apart from the discovery itself, this event proved the inestimable value of local scientific societies such as the Leeds Geological Association, as it was almost a certainty that but for the work of the latter this specimen would never have been heard of. Such remarks from one of the great masters of science should encourage our members, and stimulate them to renewed exertions. In justice I must add that my friend, Mr. C. Brownridge, F.G.S., materially added to the success of my paper by furnishing me with a plan of the roots he had carefully drawn, one-fifth the size, coloured and shaded; this was hung in the Council Chamber at Birmingham, and excited great admiration. This plan is now with Professor Williamson, at Manchester, for permanent reproduction. The fame which this now celebrated tree had achieved put Yorkshire quarry owners thoroughly on the *qui vive*, and it was not surprising that, some little while after, a second example of some colossal fossil roots was reported to me, and along with my friends Mr. C. Brownridge, F.G.S., and Mr. Hoffman Wood, F.G.S., I visited the scene of the discovery. This was again at the Fall Top Quarry, Clayton, but in a part worked by Messrs. Briggs and Shepherd. They have only partially bared it, further progress being at a standstill until a road is diverted. Being in near proximity to the former example, it is of course in the same geological horizon, and the remarks upon the strata will apply also in this case. In order that a comparison might be instituted between this and the former discovery, the following measurements of the second fossil roots were carefully made by the gentlemen above named. The diameter of the area, bared at the time of the visit, was from north to south twenty feet, and from east to west twenty-two feet four inches, or a superficial area of four hundred and forty-six feet. There are eight roots again in this example, some not yet bared very far, and all those exposed are

broken at their extremities. Details of the roots are as follows:—

Root No.	Diameter close to stump.	Distance from stump to bifurcation of roots.	Distance from point of bifurcation to present termination of root.		Greatest length of root.
			Right fork.	Left fork.	
	Inches.	ft. in.	ft. in.	ft. in.	ft. in.
1	20	6 0	2 3	2 6	8 6
2	20½	7 6	1 9	2 6	10 0
3	19	7 6	6 0	8 6	16 0
4	17½	8 0	7 6	7 6	15 6
5	20	7 0	3 0	0 3	10 0
6	18	7 0	4 0	1 9	11 0
7	20	7 0	not bared.		7 0
8	20½	part bared.		ditto.	5 6

The stump is almost entirely denuded away, as at the utmost some twelve or fifteen inches only can be said to be left of it; what is left is irregular in shape, but approximately circular, with an average diameter of three feet eleven inches. The markings on the roots are not so fine as on the first specimen, still it is another example of *Stigmaria ficoides*. There are many broken pieces of *Stigmaria* laid about in various places, but we were informed that they did not all belong to the tree in question; and as they were thus mixed it would be quite unreliable to attempt to restore the roots to their original length. Although most certainly this is a magnificent specimen, yet, after careful comparison and due consideration of all points, we did not consider it as fine an example as the one previously discovered by Messrs. Murgatroyd. Occurring about the same time as the last case, there were discovered some fossil roots at Bradford. These were also in the lower coal measures, and were come across by workmen in excavating for the crection of some new buildings in Darley Street. As in the former cases, these too were uncovered with great care. I had not an opportunity of seeing the specimens *in situ*, but my friend Dr. Monckman furnished me with the following particulars:—There are seven distinct stumps in position, within a distance of twelve yards, varying in size from one foot six inches to two feet six inches in diameter. The roots are in loose sandy shale, the stumps in ragstone, in which ripple-marked and worm-tracked stones are found. The largest stump has a diameter of two feet six inches, longest axis, and two feet diameter at right angles to longest axis. It has been partly bared only, showing some stigmarian roots. The larger roots and the stumps are covered with carbonaceous matter. The second stump is smaller; height of stump, one foot eight inches; longest diameter, seventeen inches; at right angles to this, sixteen inches. There are

four chief roots at right angles to each other, stretching roughly S.E., S.W., N.W., and N.E. From the stump to the bifurcation of the root is, approximately in each case, two feet; diameters of roots near the stump vary from eight inches to nine inches; length of root exposed, five feet six inches. At the time of this report the remainder of the stumps were not bared, and, indeed, owing to the exigencies of trade, the whole of them, with one exception, were speedily covered up again. The exception I name was presented by the contractors to the Bradford Free Museum, where it has been appropriately mounted and can be readily inspected. Another discovery of a fossil tree has been made at Ilkley, and was first reported by Mr. Pease, a visitor at Ben Rhydding. Mr. Hoffman Wood, F.G.S., has given much attention to this example, and pioneered by him, I, along with Mr. Brownridge, F.G.S., inspected it. This was discovered in a quarry just under the bold escarpment which overhangs the valley of the Wharf, and is very near to the well-known "Cow" and "Calf" rocks. The stone is of the third grits in the millstone grit series, known also as the Addingham Edge Rock. In character it is a coarse, massive grit stone, and in one of the vertical faces of the rock just uncovered there lies partially exposed, in a horizontal position, the straight cylindrical stem of a small fossil tree. At our visit the length exposed was nine feet two inches, with a diameter at one end of twelve inches, and of nine inches at the other. When first revealed it was covered with a carbonaceous bark; but assiduous relic hunters, with more idle curiosity than love for science, have carefully removed every vestige. Now that the bark has been removed, there can be seen small ridges running round the trunk at distances varying from one-and-a-half to three inches. At the thinner end can be faintly discerned small hollows, as if caused by excrescences on the bark. These are irregular in position. Specimens of fossil vegetation from the millstone grit do not, generally speaking, retain much of their structure; and in the absence of sections, which were impossible to obtain, it could not be positively identified. However, from its appearance, it is more than probable that it has been a conifer, possibly a *Dadoxylon*. Since our visit, Mr. Wood reports that the tree has been further uncovered to a length of twenty-five feet, and also that within a radius of thirty feet from this example, the remnants of five more specimens are now visible. This has evidently been a drifted mass of vegetation, embedded in the sand banks of the millstone grit period. The description of these fossils was much enhanced by reference to diagrams of the same, which had been carefully drawn to scale by Mr. C. Brownridge, F.G.S., to whom

the writer of this paper is deeply indebted for his practical and kindly help. The great importance was impressed upon the members of reporting all geological observations they might make, and the value of making notes upon, and sketches of, any section. What would seem unimportant at the time, might possibly be, after careful study and working out, a valuable discovery. Thus the accidental sight of a small portion of stigmarian roots by Messrs. Murgatroyd, certainly led to all the discoveries named; and, again, the visit of the members to the "Hitchingstone" really led to the formation of the Yorkshire Boulder Committee. These are cases in point, and should stimulate our members in the work of the future.



