

Obituary.

JAMES WILLIAM DAVIS, F.G.S., F.L.S., F.S.A.

It is now more than a year since the Yorkshire Geological and Polytechnic Society lost, by the rude hand of death, its talented and highly esteemed Honorary Secretary, James William Davis, F.G.S., F.L.S., F.S.A. No member of this Society ever left so enduring an impress on its character and development, and indeed time only deepens our sense of obligation and irreparable loss.

Several excellent memoirs have already appeared of our friend, notably those published in the Quarterly Journal of the Geological Society of London, No. 198, May 1st, 1894; the Geological Magazine, September, 1893; and the Yorkshire "Naturalist." Whilst these have given admirable sketches of the character and general work of Mr. Davis, there still remains to be recorded the story of his special relations to our own Society, of which he was so distinguished an ornament.

The subject of our memoir was born near Leeds, on 15th April, 1846, and from his earliest years his abounding energy, his thirst for knowledge, his taste for Natural History pursuits, his keen love of nature, from both æsthetic and scientific stand points, were strongly marked. When a mere boy he regularly kept a diary, in which he entered notes on various subjects of interest, and laid down for himself an extended course of study, embracing Science, English Literature and Languages; and, ever an indefatigable worker he contrived, whilst neglecting no business duty, to use wisely every available spare hour for the cultivation of both body and mind. He had a rare gift of attracting the friendship and goodwill of any intellectual mind he came in contact with, and the force of his personal character usually placed him in the front rank as a leader in any scheme with which he became connected.

About 1864 he removed from Leeds to Halifax, and entered himself a student at the Haley Hill College (founded by the late Colonel Akroyd, who was an earnest educationalist, at a time when



Sincerely Yours
James W Davis

it was not so popular a rôle as it is to-day), he competed successfully in the Society of Arts Examination for the Chemistry prize, and carried off the silver medal for his year. In connection with the college a small band of students met together to read and discuss papers on various scientific subjects, and it was here that the present writer had the good fortune to make Mr. Davis' acquaintance, and to commence a lifelong friendship which deepened in mutual respect as years passed on, and with never a shadow of coolness or misunderstanding to mar it. Very shortly afterwards we were joined by Mr. Percy Sladen, F.L.S., and removing the scene of our studies to the Halifax Museum we entered upon a course of practical comparative anatomy, in which we were ably assisted by the resident Curator, Mr. Alexander Campbell, who in his youth had been associated with Professor Jamieson, of Edinburgh, and who possessed a sound knowledge of Osteology in all its branches. Here were dissected with youthful enthusiasm types representative of the chief classes of the animal kingdom. Parrots, crocodiles, serpents, apes, and last, but not least, a chimpanzee were procured from a Liverpool dealer in foreign animals. At this time Mr. Davis excelled in the preparation of the skeletons of fishes, and no doubt acquired much skill and knowledge, which afterwards proved invaluable to him when he took up as a speciality the study of the Carboniferous fish remains. This Society became ultimately merged into a select company, meeting at the residences of its members in later years, and was joined by C. P. Hobkirk, F.L.S., J. Stubbins, F.R.M.S., and the late George Brook, Jun., F.L.S. Month by month the friends met in delightful intercourse to discuss new points of scientific interest as they arose from time to time, and to spend together in invigorating converse and genial fun cheerful hours, which doubtless are treasured up as precious memories by the survivors.

The visit of Professor Sollas, F.R.S., to Halifax, to lecture on Geology in connection with the University Extension Scheme, led to an intimate friendship which tended to strengthen Mr. Davis' growing partiality for Geological and Palæontological studies, as was evidenced by his forming the Halifax Geological Field Club, a Society which has flourished for more than twenty years, and still

does excellent local work under the title of the Halifax Scientific Society. This, however, was not sufficient for the energetic personality of our friend, who began to add to the verification of the facts contained in Geological Text Books and Manuals, the practical study in the field of the phenomena presented by the cliffs, hills, mountains, and dales of his own county. For several years scarcely a week passed without journeys to one part or another of the county, observing, taking notes, making diagrams and sketches, and the whole culminated in the publication of his *Geology and Botany of West Yorkshire*, the Botanical portion of the work being written by Dr. F. Arnold Lees.

When the British Association held its annual meeting at Bradford, Mr. Davis became a member, and came into contact with the late Professor Philips, Dr. J. Gwyn Jeffreys, and other distinguished scientists, who fanned the flame of his increasing ardour for scientific work. From this time forward he attended most meetings of the Association, where he gathered around him a genial and friendly company of those like-minded with himself; he contributed papers almost yearly, and became an active member of Section C. The following year at the Belfast meeting he made the acquaintance of the late Lord Enniskillen and the late Sir Philip Egerton, who were attracted by his enthusiasm for their own special branch of palæontology, and who showed their friendly regard by laying open their rich cabinets for his study and heartily encouraging him in his work, and thus helped to confirm him in those Ichthyological researches which became his special department of scientific investigation.

What he managed to accomplish in this kind of work, notwithstanding scant leisure and amid a crowd of business, social, educational, and municipal engagements, is permanently recorded in his numerous contributions to the British Association Reports; the Proceedings of the Yorkshire Geological and Polytechnic Society; the Journal of the Geological Society of London; and particularly in the monographs published by the Royal Society of Dublin, viz., "On the Fossil Fishes of the Mountain Limestone of Great Britain" (1883); "On the Fossil Fishes of the Chalk of Mount Lebanon and Syria" (1887); and "On the Fossil Fishes of the Tertiary and

Cretaceo-Tertiary Formations of New Zealand" (1883). Even the dark days which slowly heralded the end of his labours were largely devoted to his beloved studies, and to the commencement of what promised to become the most brilliant of all his publications, a Monograph of "The Carboniferous Fishes," doubtless a vast undertaking, but we venture to think one which his enthusiasm, his energy, and large experience would have successfully grappled with had he been spared a few years longer. For it must be remembered that his own collections of the necessary material were very extensive, and that his knowledge of the specimens contained in the public and private collections of our own country was supplemented by a wide knowledge of the types to be found in almost every European Museum, and in many foreign private cabinets.

The objects for Mr. Davis' geological study were many of them collected by himself personally, in the field, for he was no mere closet and library geologist, but delighted to ramble, hammer in hand, wherever sections of the strata could be found, either in cliff, mine, quarry, railway cutting, hill or mountain side; and this brought him into contact with the shrewd and intelligent working men of his own county, and especially with the miners of the West Riding. He was always popular with the miners, who delighted to help him in his work, and to whom his genial, frank, manly nature strongly appealed, and to-day the mention of his name will evoke a spark of pleasurable recollection in the eyes of many a humble friend of his among the toilers in mine and quarry.

Our late Secretary was emphatically a Yorkshire geologist, of which profession two permanent records exist; first, his "West Yorkshire;" and second, his numerous annual contributions to our own Journal. Only those who were intimate with Mr. Davis have the faintest conception of the time, careful thought, and personal expenditure which he devoted to the interests of the Yorkshire Geological and Polytechnic Society. He was Secretary, Editor, Contributor. Whip, in short the very soul of it. Untiringly, continuously, he wrote papers, stimulated the younger members, persuaded whomsoever he came across who showed the least interest in geology to join the Society, corresponded freely with the honorary and permanent

officials, whipped up the attendance at the meetings, sought out contributors and contributions, revised proofs, travelled the length and breadth of the county to find suitable objects for photographs, superintended the preparation of the plates, talked and wrote about the work to and for "all sorts and conditions of men," and, as it has been well expressed, "changed the state of affairs when some twenty years ago it was on the verge of dissolution, and by dint of enthusiasm and perseverance raised it to a prosperous and useful condition, and nearly quadrupled the number of its members."

Another admirable record of his energy is the "History of the Yorkshire Geological Society, 1837-1887," the jubilee volume, a work of nearly 500 closely printed pages, the sole work of his own hands, where, modestly writing little about his own efforts and sacrifices, he sketches the labours of the founders and the work of his contemporaries with generous recognition, and preserves to us in the character sketches much valuable information which must otherwise have inevitably perished.

At a general meeting of the members of the Society, held at Barnsley on April 27th, 1876, Mr. Jas. W. Davis was elected honorary secretary in place of Mr. L. C. Miall, who resigned. At the annual meeting following this election, held in October, 1876, the Secretary reported that the number of members had been increased to 115, and a debt for printing of more than £20, which had accumulated up to the year 1870, had been paid off, and that a summary of the geological literature relating to the West Riding of Yorkshire had been prepared. In this year the Secretary organised a successful and interesting excursion to the Victoria Cave, near Settle, under the leadership of Mr. R. H. Tiddeman, M.A., F.G.S., who conducted the party to the cave, and explained its history and the important results obtained by its investigation, after which the large collection of prehistoric remains from the cave, which are deposited in the Giggleswick Museum, was visited. In 1877 Mr. Davis, in addition to his secretarial duties, read a paper on the unconformability of the Permian Limestone to the red rocks west of its escarpment in central Yorkshire, and every succeeding annual volume of our Proceedings has been enriched by one or more papers

from his pen. At the meeting held at Huddersfield in October, 1877, he proposed and carried a resolution that the sphere of the Society's operations should be extended from the West Riding so as to embrace the whole of the county, and that the future title of the Society should be "The Yorkshire Geological and Polytechnic Society."

During 1878 the number of members was increased by 30 per cent. Meetings were held at Selby, Scarborough, and Wakefield; ten papers were contributed, and five additional local secretaries were appointed.

In 1879 the number of members reached 207. Three meetings were held, viz., at Barnsley, North Grimston, and Skipton. This year the Secretary obtained an addition to Rule vi. of the Society, viz., "That members may compound for their annual subscriptions, and become life members on payment of six guineas." The wisdom of this alteration is demonstrated by the response with which it has been met, and by the fact that the Society has now a capital sum of £350 safely invested as a provision against unexpected contingencies.

Perhaps the most notable excursion of this year was the one to Raygill to inspect a fissure in a limestone quarry, from which the bones of elephant, rhinoceros, bison, urus, hyæna, &c., had been obtained. At a succeeding meeting of the Council it was considered desirable that steps should be taken to secure a thorough investigation of the Raygill fissure and its contents, and Professors Green and Miall, with Messrs. Brigg and Davis, were appointed a committee, and empowered to collect subscriptions, to make necessary arrangements, and to carry out the exploration.

In 1880 four general meetings were held, viz., at Halifax, York, Middlesborough, and Leeds. At the annual meeting the Secretary had to report the number of members at 234.

During 1881 two meetings were held, one at Bradford, and one at Hull, from the latter place an excursion was made to Withernsea, when Prof. James Geikie explained the glacial phenomena of the district.

The three 1882 meetings were held, one at Dewsbury, one at

Harrogate, and one at Pontefract. The feature of the Harrogate meeting was a week's excursion in conjunction with the Geologists' Association of London, under the guidance of Mr. Huddleston, M.A., F.R.S., and Mr. Davis, when the geological features of interest in the neighbourhood of Harrogate, Knaresbro' and Plumpton, Skipton, Bolton Abbey, Malham, Gordale, Victoria Cave, Settle, Giggleswick, Clapham, Norber, and Horton in Ribblesdale were explored.

The Society's meetings in 1883 were held at Hull, Leeds, Ripon, and Halifax; the Hull meeting comprised a three days' excursion to Kilnsea, Spurn Point, Hornsea, and Skipsea. The examination of an ancient lake-dwelling was the chief point of interest, which is admirably described in a communication thereon by Mr. Davis in our Proceedings for that year.

Leeds and Harrogate were the centres at which the 1884 meetings were held. 1885 was marked by three meetings; held at Malton, York, and Leeds.

An excursion to Leyburn in Wensleydale, a meeting at Barnsley, and the Annual Meeting at Wakefield were held in 1886.

At the first General Meeting of 1887, held at Halifax, at the Hon. Sec.'s instigation a sum of Ten Pounds was devoted to the purpose of investigating a preglacial deposit near Bridlington, from which portions of a skeleton of *Elephas* had been obtained, the superintendence of the necessary excavation being entrusted to Messrs. Davis, Lamplugh, and Boynton.

During the summer an excursion was organised to Bridlington Quay, Sewerby, Speeton, Bempton, and Flamborough.

1887 was the 50th Anniversary of the formation of the Society and was celebrated by a Jubilee Meeting, which was held at the Town Hall, Ripon, on Saturday, the 22nd October, when the members of our Society expressed their high appreciation of the valuable and disinterested services rendered for many years by their Hon. Secretary by presenting to him a handsome Binocular Microscope, along with the accessory appliances suitable to the proper equipment of a geological worker.

The President, the Marquis of Ripon, K.G., LL.D., &c. occupied

the chair and was supported by Prof. J. W. Judd, F.R.S., President of the Geological Society, London, Prof. A. H. Green, F.R.S., Prof. L. C. Miall, F.R.S., Prof. N. Bodington, M.A., and other distinguished scientific gentlemen, and was attended by most of the geologists of our county.

The Address, which accompanied the presentation, was as follows :—

To JAMES W. DAVIS, Esq., F.G.S., &c., Chevinedge.

Dear Sir,—We, the undersigned members of the Yorkshire Geological and Polytechnic Society, have much pleasure in presenting you with a first-class large compound binocular microscope, with all necessary accessories, as a mark of the esteem in which we hold you personally, and as some little acknowledgment of the great services which you have rendered to the Society as Honorary Secretary and Editor of the Annual Proceedings during a period of twelve years ; to the ability and zeal which you have shown in this labour of love, as well as your personal efforts in generally promoting the welfare of the Society, and your uniform courtesy to the members, much of its present prosperous condition must be attributed ; and in the hope that you may long be spared to continue your labours, and enrich the Proceedings by your own valuable researches,

We subscribe ourselves,

October, 1887.

(Signed)

RIPON, President.

Three meetings were held in 1888, the first one at Leeds, where Professor A. H. Green, F.R.S., presided. After this meeting the Society had the pleasure of entertaining Professor Green at dinner at the Great Northern Hotel, on the occasion of his leaving the Yorkshire College to accept the chair of Geology at the University of Oxford. The second was a combined meeting and excursion. On August 29th the members of the Skipton Naturalists' and Scientific Association joined the members of our Society, who then proceeded by way of Thorpe to visit Elbolton Cave, afterwards to Burnsall, and returned by Barden Tower and Bolton Woods to Skipton. At the third meeting, held at Halifax, the Secretary reported that the Proceedings and Memoirs of some forty societies situate in various

towns and cities of Europe, America, and even Australia, had been received in exchange for our Proceedings.

In 1889 three meetings were held at Malton, Hickleton, near Doncaster, and Leeds, at the latter meeting a grant of £5 was voted from the funds of the Society to Mr. G. R. Vine, to enable him to pursue his researches on the Fossil Polyzoa.

In 1890 our Hon. Secretary exerted himself successfully in promoting a subscription for funds to form a Memorial to the late Mr. S. A. Adamson, F.G.S., who had held the position of Local Secretary of our Society for the Leeds district. The Annual General Meeting of the Society was held at Halifax. At the British Association for the advancement of science which was held that year in Leeds Mr. Davis took an active part in the leadership of the geological excursions, particularly those to Flamborough and Bridlington.

In 1891 a united excursion of the members of the Geologists' Association, of London, with the members of this Society was made to the Yorkshire Coast, and extended from the 3rd to the 8th of August: the places of interest visited included Flamborough Head, Mr. Mortimer's Museum, Mr. Boynton's Ulrome Collections, Speeton, Filey Brig, Scarborough Museum, Castle Hill, Peak, Blea Wyke, Cloughton, Gristhorpe, Hackness, Hawsker, Whitby, and Malton. The Annual Meeting was held at Leeds. During this year Mr. Davis was elected a member of the Council of the Geological Society of London.

The printed records of our Society terminate with the volume for 1893, in which the Secretary's report concludes with an account of the business of the year 1892. Two meetings were held, the first at York, and the second, the Annual Meeting, at Leeds, on 14th December, 1892, when Mr. Davis strongly urged the claims of the Upper Wharfedale Exploration and particularly drew the attention of the Society to a resolution of the Council to this effect, viz., "That the Society be recommended to undertake the exploration of certain prehistoric remains in Upper Wharfedale; that a special subscription be raised for the purpose." This meeting was, I believe, the last General Meeting of our Society which our late Hon. Secretary attended. At this time the first pre-

monitions of the coming trouble had been given, but it was hoped that by care and rest from some of the many varied and heavy duties which had fallen to his lot, and perhaps by change of scene and travel he would soon regain his wonted vigour. Mr. Davis spoke quite cheerfully about himself, and in his usual genial and jocose fashion made light of his own ailments.

The very brief sketch we have given of the Society's work during the many years that Mr. Davis held the Secretaryship, will indicate to some extent his versatility, his splendid organising power, and his great personal influence. That he was a man of broad views and many-sided gifts his numerous papers, written between 1874 and 1893, will show. They are not restricted to Fossil Fishes, for in perusing the long list of 60 contributions, which we append at the close of this memoir, it will be seen that his attention was given to such subjects as Physical Geology, Glaciation, Palæobotany, Cave Exploration, Prehistoric Man, Archæology, Lake Dwellings, &c.

In 1892 our friend, who had hitherto enjoyed splendid health and whose magnificent physique and active habits gave promise of a long and prosperous life, began to feel a diminution of energy, and symptoms of insomniæ began to present themselves; in spite of the wishes of his medical adviser and those of his most intimate friends he in his generous ardour for the public good pushed aside all mere personal considerations and accepted the Mayorality for a third time; doubtless his intense desire to see the completion of the Halifax Technical School for which he had laboured consistently, enthusiastically and persistently for several years, had much weight in determining this decision,—indeed his last visit to Halifax was paid in order to visit the school. A visit to Paris in May failed to give him the relief he sought for, he returned home, and afterwards spent some weeks at Grassington, where he seemed to somewhat recover his health; leaving Grassington he removed to his favourite sea-side residence at Bridlington, and still feeling better he visited Halifax in July, where he stayed a day or two attending to various business and municipal duties, returning to Bridlington on the evening of Tuesday, the 19th July, on arriving there he wrote and posted some letters and then laid down on the couch, on his awaking from a short sleep it was

found that he had lost the power of speech ; rupture of a vessel in the brain was followed by paralysis, and after this, in spite of every effort of the best medical skill, the patient gradually became weaker and though retaining consciousness to the last was unable to hold any communication with his family or friends beyond what could be expressed by the language of the eyes ; early on the morning of Friday, at about 3 o'clock, the end came, and a brave and noble presence passed from our midst. The sad news cast quite a gloom over Halifax, and, when it was known that its Mayor was no more, expressions of profound sympathy poured in from all sides. The President of our own Society, The Marquis of Ripon, the senior member for Halifax, the Right Hon. James Stansfeld, M.P., and the chief representatives of the numerous public and scientific institutions with which Mr. Davis had been associated hastened to condole with the bereaved family, and to testify to the deep-felt and wide-spread esteem and affection in which the memory of the deceased was everywhere held. As was fitting, a public funeral was accorded ; one of the largest and most imposing ever seen in Halifax. The order of the procession was as follows :—

The Chief Constable, Mr. Pole.

The Police.

Workpeople from the Greetland Dyeworks.

Tradesmen and Burgesses.

Clergy and Ministers.

Trustees and Directors of the Halifax Equitable Benefit Building Society.

Members of the Halifax Mechanics' Institute.

Members of the West Vale Mechanics' Institute.

Members of the Halifax Board of Guardians.

Members of the Halifax School Board.

Members of Various Local Boards.

Elland Division Liberal Association.

Governors of Heath Grammar School.

Governors of the Crossley Orphanage.

Halifax Technical Institute Committee.

Halifax Literary and Philosophical Society.

Representatives of the Geological Society.
Leeds Geological Society.
Leeds Field Naturalists' Club.
Yorkshire Geological and Polytechnic Society.
Yorkshire Naturalists' Union.
Leeds Astronomical Society.
Governors of the Yorkshire College, Leeds.
Freemasons—Lodge of Probity (61) St. James' and other Lodges.
Halifax Chamber of Commerce.
Corporation Officials.
County and Borough Magistrates.
Members of Parliament.
Councillors.
Aldermen.
Deputy Mayor and Borough Treasurer.
The Mace.
The Hearse.
Mourners' Carriages.
Other Carriages.

The last ceremony took place at Salterhebble Church, and was most impressively conducted by Archdeacon Brooke, Canon Warneford, and Rev. G. T. Jowett.

The broad sympathetic frank genial nature of Mr. Davis everywhere won him friends; the silent reverent respect with which the crowds of people who lined the streets as the sad procession passed along bore evidence of this, and this feeling was manifested in various ways by all classes.

Only the briefest reference can here be given to his position as a public man apart from his career as a geologist. As an educationist he was unwearied; he was for some years Chairman of the Scientific Committee of the Halifax School Board, and the chief promoter of the Halifax Technical School, in which to the last days of his useful life his active interest was intense; he introduced the Gilchrist Lectures to Halifax; he was for a time Secretary of the Yorkshire Fine Art Society; an active member and Chairman of Committee of the Yorkshire Naturalists' Union; held in due

course the Chairmanship of the Halifax Literary and Philosophical Society, and of the Halifax Scientific Society; was a Governor of the Yorkshire College; and was thrice elected Mayor of Halifax; and in all these spheres of usefulness he has left a void which will not too easily be filled, but, of them all, none (except his own family) will feel his loss more keenly than our own Council and members, and none will longer miss than the writer

“The touch of a vanished hand
And the sound of a voice that is still.”

WILLIAM CASH.

LIST OF MEMOIRS, PAPERS, &c., BY JAMES WILLIAM DAVIS, F.G.S.

1. Monthly analytical examination of the Harrogate Spas, 1872 [1873]. Pharmaceut. Journ. vol. iv. (1874), pp. 481, 482.
2. On a bone-bed in the Lower Coal-measures, with an enumeration of the Fish-remains of which it is principally composed. Quart. Journ. Geol. Soc. vol. xxxii. (1876), pp. 332-340.
3. West Yorkshire, by J. W. Davis and F. A. Lees. An account of its Geology, Physical Geography and Botany. Maps and plates, 8vo, London, 1878.
4. The Ichthyography of the Northern portion of the West Riding Coal-field. Proc. Mid. Inst. of Min. C. and M. Engineers, vol. vi. pt. xlii. p. 1. 1878.
5. The physical forces which have caused the present configuration of the Valley of the Calder in Yorkshire. GEOLOGICAL MAGAZINE, Dec. II. vol. v. (1878), pp. 500-508.
6. On the Occurrences of certain Fish-remains in the Coal-measures, and the evidence they afford of their fresh-water origin. Brit. Assoc. Rep. (1878), p. 539; Proc. Yorkshire Geol. Soc. vol. vi. (1879), pp. 40-52.
7. Erratic Boulders in the Valley of the Calder [1875]. *Ibid.* vol. vi. (1879), pp. 93-100.
8. The Stems and Roots of Fossil Trees in the Lower Coal-measures at Wadsley, near Sheffield [1876]. *Ibid.* vol. vi. (1879), p. 79.
9. Unconformability of the Permian Limestone to the Red Rocks west of its Escarpment in Central Yorkshire [1877]. *Ibid.* vol. vi. (1879), pp. 280-308.
10. Notes on *Pleurodus affinis*, sp. ined., Agassiz, and description of three spines of Cestracionts from the Lower Coal-measures [1878]. Quart. Jour. Geol. Soc. vol. xxxv. (1879), pp. 181-187.
11. On *Ostracacanthus dilatatus*, gen. et. sp. nov. . a Fossil Fish from the Coal-measures S.E. of Halifax, in Yorkshire. Brit. Assoc. Rep. (1879), p. 343; Proc. Yorkshire Geol. Soc. vol. vii. (1881), pp. 191-195.
12. On the source of the Erratic Boulders in the Valley of the River Calder, Yorkshire. GEOL. MAG., Dec. II. vol. vi. (1879), pp. 313-321; Proc. Yorkshire Geol. Soc. vol. vii. (1881), pp. 141-145.

13. Description of a New Species of Fossil Fish-spine, *Ctenacanthus minor*, from the Lower Coal-measures of Yorkshire. *GEOL. MAG.*, Dec. II. vol. vi. (1879), pp. 531, 532.
14. On the Fish-remains found in the Cannel Coal, in the Middle Coal-Measures of the West Riding of Yorkshire, with the Descriptions of some New Species (1879). *Quart. Journ. Geol. Soc.* vol. xxxvi. (1880), pp. 56-67.
15. On the Teleostean Affinities of the Genus *Pleuracanthus*. *Ann. Mag. Nat. Hist.* ser. 5, vol. v. (1880), pp. 349-357.
16. On a New Species of *Gyracanthus*, a Fossil Fish from the Coal-measures (*Gyrac. denticulatus*). *Ibid.* ser. 5, vol. vi. (1880), pp. 372, 373.
17. On the genus *Pleuracanthus*, Agass., including the genera *Orthacanthus* Agass. and Goldf., *Diploodus*, Agass., and *Xenacanthus*; *Beyr. Quart. Journ. Geol. Soc.*, vol. xxxvi. (1880), pp. 321-336.
18. On a Group of Erratic Boulders at Norber, near Clapham, in Yorkshire [1880]. *Proc. Yorkshire Geol. Soc.* vol. vii. (1881), pp. 266-273.
19. On the Distribution of Fossil Fishes in the Yorkshire Coal-fields [1880]. *Ibid.* vol. vii. (1881), pp. 228-241; *Proc. Geol. Assoc.* vol. vi. (1881), pp. 359-370.
20. Report of the Raygill Fissure Exploration Committee [1880]. *Proc. Yorkshire Geol. Soc.* vol. vii. (1881), pp. 300-305.
21. On the Exploration of a Fissure in the Mountain Limestone at Raygill. *Brit. Assoc. Rep.* (1881), pp. 645, 646.
22. On *Palæospinax priscus*, Egerton. *Ann. Mag. Nat. Hist.* vol. vii. ser. 5 (1881), pl. xx. pp. 429-432.
23. On the genera *Ctenoptychius*, Agassiz; *Ctenopetalus*, Agassiz; and *Harpacodus*, Agassiz. *Ann. Mag. Nat. Hist.* ser. 5, vol. viii. (1881), pp. 424-427.
24. Notes on the Fish-remains of the Bone-bed at Aust, near Bristol; with the Description of some New Genera and Species. *Quart. Journ. Geol. Soc.* vol. xxxvii. (1881), pp. 414-425.
25. On *Anodontacanthus*, a New Genus of Fossil Fishes from the Coal-measures; with Description of three New Species [*A. acutus*, *obtusus*, *fastigiatus*]. *Ibid.* vol. xxxvii. (1881), pp. 427-429.
26. On the Fossil Fish-remains from the Armagh Limestone in the Collection of the Earl of Enniskillen. *Proc. Geol. Soc.* vol. xxxviii. (1882), pp. 12, 13.
27. On the Fossil Fishes of the Carboniferous Limestone Series of Great Britain [1882]. *Trans. Roy. Dublin Soc. Sci.* vol. i. (1883), pp. 327-600, plates xlii-lxv.
28. Notes on the Occurrence of Fossil Fish-remains in the Carboniferous Limestone Series of Yorkshire [1882]. *Proc. Yorkshire Geol. Soc.* vol. viii. (1884), pp. 39-63.
29. Description of a New Species of *Ptycholepis* from the Lias of Lyme Regis. *Ann. Mag. Nat. Hist.* series 5, vol. xiii. (1884), pp. 335-337, pl. x.
30. Biographical Notices of Eminent Yorkshire Geologists. i. John Phillips. *Proc. Yorkshire Geol. Soc.* vol. viii. pp. 3-20 (1882).
31. Description of a New Genus of Fossil Fishes from the Lias. *Ibid.* ser. 5, vol. xiii. (1884), pp. 448-453, pl. xvi.
32. On some remains of Fossil Fishes from the Yoredale Series at Leyburn in Wensleydale. *GEOL. MAG.*, Dec. III. vol. i. (1884), pp. 91, 92.

33. On some Sections exposed during the Formation of the Line of Railway between Upton and Kirk Smeaton [1882]. Proc. Yorkshire Geol. Soc. vol. viii. (1884), pp. 107-113.
34. On a New Species of *Heterolepidotus* from the Lias. *Ibid.* vol. viii. (1884), pp. 403-407, pl. xxii.
35. On the Contortions of the Chalk at Flamborough Head. *Ibid.* vol. ix. (1885), pp. 43-49.
36. Note on *Chlamydoselachus anguineus*, Garman. *Ibid.* vol. ix. (1885), pp. 98-113, pl. xi.
37. On the relative age of the remains of Man in Yorkshire. *Ibid.* vol. ix. (1886), pp. 201-214.
38. On some remains of Fossil Trees in the Lower Coal-measures at Clayton, near Halifax. *Ibid.* vol. ix. (1886), pp. 253-256.
39. On the Exploration of the Raygill Fissure in Lothersdale. *Ibid.* vol. ix. (1886), pp. 280-281.
40. On some Fish-remains from the Tertiary Strata of New Zealand. GEOL. MAG., Dec. III. vol. iii. (1886), pp. 93, 94.
41. Notes on a Collection of Fossil Fish-remains from the Mountain Limestone of Derbyshire. *Ibid.* vol. iii. (1886), pp. 149-157.
42. The Fossil Fishes of the Chalk of Mount Lebanon, in Syria. Trans. Royal Dublin Soc. vol. iii. (ser. ii.) 1886, pp. 467-636, pls. xiv.-xxxviii.
43. On *Chondrosteus acipenseroides*, Ag. Quart. Journ. Geol. Soc. vol. xliii. (1887), pp. 605-616, pl. xxiii.
44. On the ancient Flint-users of Yorkshire. Proc. Yorkshire Geol. Soc. vol. ix. (1887), pp. 411-425.
45. Note on a Fossil Species of *Chlamydoselachus*. GEOL. MAG., Dec. III. vol. iv. (1887), pp. 392, 393. Proc. Zool. Soc. Lond. (1887), pp. 542-544.
46. Note on a Species of *Scymnus* from the Upper Tertiary Formation of New Zealand. Geol. Mag., Dec. III. vol. v. (1888), pp. 315, 316.
47. On Fossil Fish-remains from the Tertiary and Cretaceo-Tertiary Formations of New Zealand. Trans. Royal Dublin Soc. ser. ii. vol. iv. (1888), pp. 1-48, pls. i-vii.
48. History of the Yorkshire Geological and Polytechnic Society, 1837-1887. Proc. Yorkshire Geol. Soc. vol. x. (1889), pp. i-ix., 1-479.
49. The Lake-Dwellings of East Yorkshire. *Ibid.* vol. xi. (1889), pp. 101-113.
50. Summary of Geological Literature relating to Yorkshire published during 1888. *Ibid.* vol. xi. pt. i. (1889), pp. 128, 129.
51. On the Fossil Fish of the Cretaceous Formations of Scandinavia. Trans. Royal Dublin Soc. vol. iv. ser. ii. (1890), pp. 363-434, pls. xxxviii.-xlvi.
52. Fossil Fish-remains from Carboniferous Shales at Cultra, co. Down, Ireland. Proc. Yorkshire Geol. Soc. vol. xi. pt. ii. (1890), pp. 332-334.
53. Summary of Geological Literature relating to Yorkshire published during 1889. *Ibid.* vol. i. pt. ii. (1890), p. 344.
54. On the Dentition of *Pleuroplax* (*Pleurodus*) A. S. Woodw. Ann. Mag. Nat. Hist. ser. vi. vol. v. (1890), pp. 291-294, pl. xiii.
55. On *Coelacanthus Phillipsii*, Agassiz. Geol. Mag., Dec. III. vol. vii. (1890), pp. 159-161.
56. Yorkshire Naturalists' Union at Bretton Park. Naturalist, (1890), pp. 223-227.

57. On a New Species of *Coccodus* (*C Lindströmi*, Davis). Quart Journ. Geol. Soc vol xlvi. pp. 565-568, pl. xxii.
 58. On the Discovery of a New Species of Fossil Fish (*Strepsodus Brockbanki*) in the Upper Coal Measures Limestone of Levenshulme, near Manchester. Mem. and Proc Manchester Lit and Phil. Soc. [4] vol iv. 1891 (reprint paged 1-3), Geol. Mag., Dec. III. vol. viii. (1891), p. 465.
 59. On some Sections in the Liassic and Oolitic Rocks of Yorkshire. Proc, Yorkshire Geol. Soc vol. xii. part ii. (1892), pp. 170-214.
 60. On the Fossil Fish-remains of the Coal Measures of the British Islands. Part i. *Pleuracanthidæ* Trans Royal Dublin Soc. Sci. [2] vol. iv. (1892), pp. 703-748, plates lxx-lxxiii and Geol. Mag, Dec. III. vol. x (1892), pp. 72-75.
- POSTHUMOUS—On the Fossil Fish-remains of the Coal-measures of the British Isles, Part II; Acanthodidae Dublin (Trans. Roy. Soc.) 1894 4. 10 pg. w. 3 plates.
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