classical memoir "Om spår af några evertebrerade djur, etc." (1881, K. Svenska Vet. Akad. Handl., vol. xviii, No. 7), have shown that they are almost certainly to be attributed to Crustacea. Such a track as the present one was probably formed by a large crustacean swimming close to the sea-floor rather than crawling on a mud-flat. It is of the same general character as *Polykampton alpinum* Ooster, 1869, from the Rhætic of Switzerland ("Protozoë Helvetica," vol. i, p. 23, pl. iv), and *Delesserites foliatus* R. Ludwig, 1869, from the Upper Devonian of Dillenburg (*Palæontographica*, vol. xvii, p. 113, pl. xx, fig. 4).—F. A. B.

OBITUARY.

E. A. NEWELL ARBER, M.A., Sc.D., F.G.S., F.L.S.

BORN AUGUST 5, 1870. DIED JUNE 14, 1918.

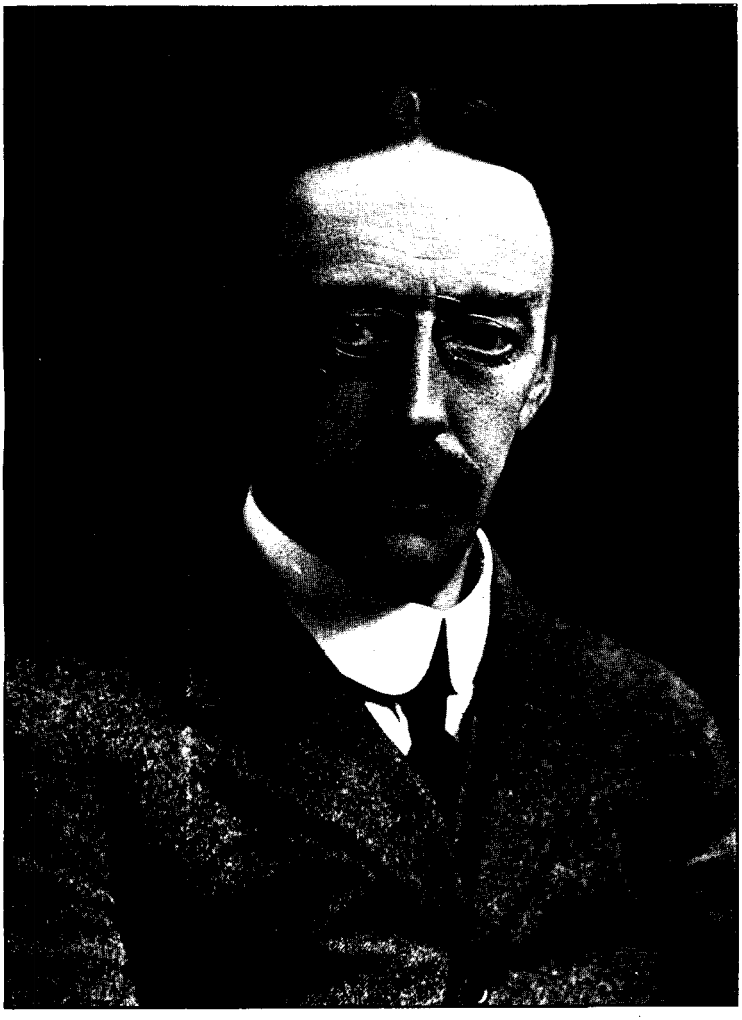
(WITH A PORTRAIT, PLATE XV.)

EDWARD ALEXANDER NEWELL ARBER was born at No. 5 Queen Square, Bloomsbury, in 1870. His father was Edward Arber, afterwards Professor of English at Mason's College, Birmingham, and known as the editor of many English classics. His mother (*née* Marion Murray), the daughter of a Glasgow publisher, was the niece of Dr. John Sutherland, an early authority on army sanitation, who was closely associated with Florence Nightingale's work in the Crimea.

Newell Arber had much illness in early boyhood, and at the age of fifteen he was sent, for the sake of his health, to Davos, where he spent more than a year. It was during his first Swiss summer that he awoke to the fascination of botany; his interest in geology was aroused later, apparently at the beginning of his Cambridge career. In 1895 he came up to Trinity College, and after an undergraduate period broken by ill-health, he took the two parts of the Natural Sciences Tripos in 1898 and 1899, specializing in Botany and Geology.

In 1899 Professor T. McKenny Hughes nominated Newell Arber to a Demonstratorship in Palæobotany in the Woodwardian (afterwards Sedgwick) Museum. This post, which he held for the rest of his life, involved the curating of the palæobotanical collections, as well as elementary and advanced lectures and demonstrations in fossil botany. Newell Arber threw himself enthusiastically into museum work, and during his tenure of the Demonstratorship about 5,000 plant fossils were added to the collections, almost entirely through his instrumentality. Between 1901 and 1906 he was also responsible—in the first year, under Dr. Henry Woodward, and after that, under his successor, Dr. Arthur Smith Woodward—for the naming and arrangement of the palæobotanical specimens in the Geological Department of the British Museum (Nat. Hist.). He consolidated his knowledge of fossil plants by repeated visits to most of the principal museums in Europe in which important collections are to be found.

Research flourished in Newell Arber's laboratory, where, in



Elliott & Fry, Photo. Bale, Sons and Danielsson, Ltd.

Yours sincerely

T. A. Jewell Bales

https://doi.org/10.1017/S001675680020037X Published online by Cambridge University Press

addition to some sixty of his own memoirs, about twenty-five original papers were produced (either jointly or independently) by a group of students including at different times Bernard Smith, H. Hamshaw Thomas, L. J. Wills, W. T. Gordon, D. G. Lillie, R. D. Vernon, A. W. R. Don, R. H. Goode, and others. In 1905 a moiety of the Lyell Fund was awarded to Newell Arber by the Geological Society, and in 1914 he was elected an Honorary Member of the New Zealand Institute in recognition of his work on Australasian geology.

From the strictly geological standpoint, Newell Arber's contribution to the science may perhaps be summarized as consisting chiefly in the application of palæobotanical evidence to stratigraphical problems. One of his early memoirs (1903) dealt with the use of Carboniferous plants as zonal indices, a subject of which the foundations for this country had been so firmly laid by Dr. Kidston. Much of Newell Arber's later work was concerned with further developments on these lines, and he produced a series of papers dealing with the fossil floras and geological structure of the English coal-fields. His book on *The Natural History of Coal* was subsequently translated into Russian. The economic bearing of his palæobotanical work resulted in a consulting practice concerning the geology of coal both in this and other countries. Newell Arber did not confine his attention, however, to the Palæozoic period, but studied also the fossil floras of the Mesozoic rocks, especially those of the southern hemisphere. In this connexion his British Museum *Catalogue of the Glossopteris Flora* (1905) may be mentioned, and his recent account of the earlier Mesozoic Floras of New Zealand (1917). He continued his work to within less than three months of his death, leaving memoirs, in various stages of completion, relating to general palæobotany, and to Devonian, Carboniferous, and Mesozoic plants; it is hoped that some of these may eventually be published.

Newell Arber had an exceptionally wide knowledge of geological literature, which embraced even its obscurest corners. His interest in bibliographical questions and his high standard of accuracy in such matters, were somewhat unusual in a scientific man and were probably due to his father's influence. But he was no arm-chair geologist. He laid great stress on the importance of taking his research pupils into the open, where he initiated them into the methods of outdoor work. He had that instinct for the field, common to so many geologists, which on its material side results in a complete grasp of topography, and on its romantic side may rise to a capacity for being possessed by an absorbing passion for a tract of country. Botanically, Switzerland was his Mecca, while in his geological life Devonshire held a corresponding place. The desire to get there was often almost painfully intense; to quote from one of his letters—"I have had a bad attack of the 'West [Devon] a calling' . . . It gets worse and is getting beyond my control." Newell Arber made twelve geological expeditions to North Devon, mainly in connexion with his study of the Upper Carboniferous rocks. The difficulties of the work were extreme. As he wrote after the appearance in 1904 of his paper on the Culm Measures of

this part of England—"In the old days in the train I approached Bideford with great sinkings of heart. The possibilities of failure were immense and the chances of success seemed *nil*. Altogether I suppose it was the hardest nut I shall ever have to crack and I marvel at my luck." Later, as a by-product of this stratigraphical study, he was drawn to an investigation of the physical geology of North Devon, and in particular of the coastal waterfalls, which resulted in his book on the coast scenery of the region (1911). In much of this work D. G. Lillie and Inkermann Rogers were associated with him.

That deep-seated delight in field-work, which is in some ways the ultimate joy of the geologist, is indicated by a passage from one of Newell Arber's letters, which may perhaps not unfitly conclude this tentative outline of his geological life. "I thought I would take a holiday for the rest of the evening and indulge in a fit of 'field-fever' or 'field-dreams'. I wonder if you know what this is. Poor old Robert Dick heard or felt 'field-work' *calling* many a time. People who have been in the East, tell me they very often feel a great longing to return again. . . . A perfect day when one is in the field is one of the greatest things on earth. . . . My mania is quite a modest one. It is a desire to visit every spot in this country where fossil plants have ever been found. To gain that full power of knowledge which can only be got by having been to the place, seen it, photographed it and collected from it. When you have done this you have a 'grip' which is masterly."

A. A.

LIST OF THE MORE IMPORTANT GEOLOGICAL AND PALÆOBOTANICAL BOOKS AND MEMOIRS BY E. A. NEWELL ARBER. (A number of titles, including all purely botanical work, have been omitted for the sake of brevity.)

1901. "Notes on Royle's Types of Fossil Plants from India": GEOL. MAG., Dec. IV, Vol. VIII, pp. 546–9.

1902. "On the Clarke Collection of Fossil Plants from New South Wales": Quart. Journ. Geol. Soc., vol. lviii, pp. 1–26, 1 pl., 1 text-fig.

"Notes on the Binney Collection of Coal-Measure Plants. Part III: The Type Specimens of *Lyginodendron Oldhamium* (Binney)": Proc. Camb. Phil. Soc., vol. xi, pp. 281–5, 2 text-figs.

1903. "The Fossil Flora of the Cumberland Coalfield, and the Palæobotanical Evidence with regard to the Age of the Beds": Quart. Journ. Geol. Soc., vol. lix, pp. 1–22, 2 pls.

(Conjointly with A. C. SEWARD.) "Les Nipadites des Couches Éocènes de la Belgique": Mém. du Musée royal d'hist. nat. de Belgique, t. 2, 16 pp., 3 pls.

"Notes on some Fossil Plants collected by Mr. Molyneux in Rhodesia": Quart. Journ. Geol. Soc., vol. lix, pp. 288–90.

"On the Roots of *Medullosa anglica*": Ann. Bot., vol. xvii, pp. 425–33, 1 pl.

"The Use of Carboniferous Plants as Zonal Indices": Trans. Inst. Min. Eng., pp. 371–80.

"On Homœomorphy among Fossil Plants": GEOL. MAG., Dec. IV, Vol. X, pp. 385–8.

"Notes on Fossil Plants from the Ardwick Series of Manchester": Mem. and Proc. Manchester Lit. and Phil. Soc., vol. xlviii, Man. Mem., No. 2, 32 pp., 1 pl., 1 text-fig.

1904. "*Cupressinoxylon Hookeri*, sp. nov., a large Silicified Tree from Tasmania": GEOL. MAG., Dec. V, Vol. I, pp. 7–11, 1 pl., 2 text-figs.

1904. "The Fossil Flora of the Culm Measures of North-west Devon, and the Palæobotanical Evidence with Regard to the Age of the Beds": Phil. Trans. Roy. Soc. Lond., ser. B, vol. cxcvii, pp. 291–325, 2 pls.
(Conjointly with I. ROGERS.) "Note on a New Fossiliferous Limestone in the Upper Culm Measures of West Devon": GEOL. MAG., Dec. V, Vol. I, pp. 305–8.

1905. "On some New Species of *Lagenostoma*, a Type of Pteridospermous Seed from the Coal Measures": Proc. Roy. Soc., vol. lxxvi B, pp. 245–59, 2 pls.
"On the Sporangium-like Organs of *Glossopteris Browniana*, Brongn.": Quart. Journ. Geol. Soc., vol. lxi, pp. 324–38, 2 pls.
Catalogue of the Fossil Plants of the Glossopteris Flora in the Department of Geology, British Museum (Nat. Hist.). Being a Monograph of the Permo-Carboniferous Flora of India and the Southern Hemisphere. London, lxxiv + 255 pp., 8 pls., 1 map, 51 text-figs.

1906. "On the Past History of the Ferns": Ann. Bot., vol. xx, pp. 215–32, 1 text-fig.
"Bibliography of Literature on Palæozoic Fossil Plants, including some of the more important memoirs published between 1870–1905." Progressus Rei Botanicæ. Bd. i, pp. 218–42.
"The Origin of Gymnosperms": Science Progress, vol. i, No. 2, pp. 222–37.

1907. "On the Upper Carboniferous Rocks of West Devon and North Cornwall": Quart. Journ. Geol. Soc., vol. lxiii, pp. 1–27, 3 text-figs.
"A Note on Fossil Plants from the Carboniferous Limestone of Chepstow": GEOL. MAG., Dec. V, Vol. IV, pp. 4–5.
(Conjointly with JOHN PARKIN.) "On the Origin of Angiosperms": Linn. Soc. Journ. Bot., vol. xxxviii, pp. 29–80, 4 text-figs. (Translated into German as "Der Ursprung der Angiospermen": Österreich. bot. Zeitschr. Jahrg., 1908, p. 89, etc.)
"On Triassic Species of the Genera *Zamites* and *Pterophyllum*: Types of Fronds belonging to the Cycadophyta": Trans. Linn. Soc. Lond., ser. II, Bot., vol. vii, pt. vii, pp. 109–27, 3 pls.

1908. "On a New Pteridosperm possessing the Sphenopteris Type of Foliage": Ann. Bot., vol. xxii, pp. 57–62, 1 pl.
(Conjointly with H. HAMSHAW THOMAS.) "On the Structure of *Sigillaria scutellata*, Brongn., and other Eusigillarian Stems, in comparison with those of other Palæozoic Lycopods": Phil. Trans. Roy. Soc. Lond., ser. B, vol. cc, pp. 133–66, 3 pls.

1909. "On the Affinities of the Triassic Plant *Yuccites vogesiacus*, Schimper and Mougeot": GEOL. MAG., Dec. V, Vol. VI, pp. 11–14.
"On the Fossil Plants of the Waldershare and Fredville Series of the Kent Coalfield": Quart. Journ. Geol. Soc., vol. lxv, pp. 21–39, 1 pl.
Fossil Plants. Gowans's Nature Books, No. 21, 75 pp., 60 pls. Glasgow.
(Conjointly with H. HAMSHAW THOMAS.) "A Note on the Structure of the Cortex of *Sigillaria mammillaris*, Brongn.": Ann. Bot., vol. xxiii, pp. 513–14.

1910. "Note on a Collection of Fossil Plants from the Neighbourhood of Lake Nyasa, collected by Mr. A. R. Andrew": Quart. Journ. Geol. Soc., vol. lxvi, pp. 237–9.
"Notes on a Collection of Fossil Plants from the Newent Coal-field (Gloucestershire)": GEOL. MAG., Dec. V, Vol. VII, pp. 241–4.
"A note on some Fossil Plants from Newfoundland": Proc. Camb. Phil. Soc., vol. xv, pp. 390–2, 2 text-figs.
"Some Fossil Plants from Western Australia," III. Palæont. Contributions to the Geology of West. Aust.: Geol. Surv. Bull. 36, pp. 25–8.

1910. "On the Fossil Flora of the Southern Portion of the Yorkshire Coalfield in North Derbyshire and Nottinghamshire": Proc. Yorks. Geol. Soc., vol. xvii, pt. ii, pp. 132–55, 8 pls.
"A Note on a Fossil Wood from Intombi Camp, Ladysmith": Ann. Natal Museum, vol. ii, p. 233.

1911. *The Natural History of Coal.* x+163 pp., 21 text-figs. Cambridge University Press. (Translated into Russian, 1914.)
The Coast Scenery of North Devon, being an account of the Geological Features of the Coast-line extending from Porlock in Somerset to Boscastle in North Cornwall. xxiv+261 pp., 70 pls., 12 text-figs., 2 maps. London: Dent.
"The Culm-measures of the Exeter District": GEOL. MAG., Dec. V, Vol. VIII, pp. 495–7.

1912. "The Lower Carboniferous (Carboniferous Limestone) Flora of the Ballycastle Coalfield, Co. Antrim": Sci. Proc. Roy. Dublin Soc., vol. xiii, N.S., No. 12, pp. 162–76, 3 pls.
"The Fossil Flora of the Ingleton Coal-field (Yorkshire)": GEOL. MAG., Dec. V, Vol. IX, pp. 80–2.
"A Note on some Fossil Plants from the Kent Coal-field": ibid., pp. 97–9, 1 pl.
"On the Fossil Flora of the Forest of Dean Coalfield (Gloucestershire), and the Relationships of the Coalfields of the West of England and South Wales": Phil. Trans. Roy. Soc. Lond., ser. B, vol. ccii, pp. 233–81, 3 pls.
"On *Psygmophyllum majus*, sp. nov., from the Lower Carboniferous Rocks of Newfoundland, together with a Revision of the Genus and Remarks on its Affinities": Trans. Linn. Soc. Lond., ser. II, Bot., vol. vii, pt. xviii, pp. 391–407, 3 pls., 1 text-fig.
"The Fossil Plants of the Forest of Dean Coalfield": Proc. Cotteswold Nat. Field Club, vol. xvii, pt. iii, pp. 321–32, 4 pls.

1913. "A Preliminary Note on the Fossil Plants of the Mount Potts Beds, New Zealand, Collected by Mr. D. G. Lillie, Biologist to Captain Scott's Antarctic Expedition in the *Terra Nova*": Proc. Roy. Soc., B, vol. lxxxvi, pp. 344–7, 2 pls.
"On the Discovery of Fossil Plants in the Old Hill Marls of the South Staffordshire Coal-field": GEOL. MAG., Dec. V, Vol. X, pp. 215–16.
"On the Structure of *Dadoxylon Kayi*, sp. nov., from the Halesowen Sandstone at Witley (Worcestershire)": Quart. Journ. Geol. Soc., vol. lxix, pp. 454–7, 4 text-figs.

1914. "On the Fossil Floras of the Wyre Forest, with Special Reference to the Geology of the Coalfield and its Relationships to the Neighbouring Coal Measure Areas": Phil. Trans. Roy. Soc. Lond., ser. B, vol. cciv, pp. 363–445, 4 pls.
"A Revision of the Seed Impressions of the British Coal Measures": Ann. Bot., vol. xxviii, pp. 81–108, 3 pls., 8 text-figs.
"On the Fossil Flora of the Kent Coalfield": Quart. Journ. Geol. Soc., vol. lxx, pp. 54–81, 3 pls.
"Geology of the Kent Coalfield": Trans. Inst. Min. Eng., vol. xlvii, pt. v, pp. 677–714.

1915. (Conjointly with R. H. GOODE.) "On some Fossil Plants from the Devonian Rocks of North Devon": Proc. Camb. Phil. Soc., vol. xviii, pp. 89–104, 1 pl., 3 text-figs.
"On a little-known concealed Coalfield in Oxfordshire": ibid., pp. 180–3. (See also Trans. Inst. Min. Eng., vol. l, pt. ii, pp. 373–84, 1916.)

1916. "Studies of the Geology of the Kent Coalfield.—Part I: The Coal-measure records of four borings": Trans. Inst. Min. Eng., vol. l, pt. ii, pp. 351–72.
"On the Fossil Floras of the Coal Measures of South Staffordshire": Phil. Trans. Roy. Soc. Lond., ser. B, vol. ccviii, pp. 127–55, 3 pls., 3 text-figs.

1916. "The Structure of the South Staffordshire Coalfield, with special reference to the concealed areas and to the neighbouring fields": Trans. Inst. Min. Eng., vol. lii, pt. i, pp. 35–70.
1917. "The Earlier Mesozoic Floras of New Zealand": New Zealand Geol. Surv., Palæontological Bulletin No. 6, 80 pp., 14 pls., 12 text-figs. Wellington, N.Z.
1918. "A Note on Submedullary Casts of Coal-measure Calamites": GEOL. MAG., Dec. VI, Vol. V, pp. 212–14.

VLADIMIR PROCHOROVITCH AMALITSKY.

BORN 1860. DIED DECEMBER 28, 1917.

WE regret to learn that Professor Amalitsky, of Warsaw, died suddenly from heart failure last December at Kislovodsk, North Caucasus. He was born in Volhynia in 1860, and received his scientific education at the University of Petrograd, where he was especially attracted to geology by Professor Inostransev. He soon became an accomplished student, and early in his career was appointed Professor of Geology in the University of Warsaw. Afterwards he assumed the direction of the Polytechnic Institute in Warsaw, and was occupied with his duties there at the outbreak of war in 1914.

Professor Amalitsky devoted himself with great success to the study of the Permian formations of Russia, and made a special effort to discover remains of terrestrial and freshwater faunas and floras in these rocks. He first met with unusually well-preserved freshwater bivalved shells of the family Anthracosiidæ, which he described in the *Palæontographica*, vol. xxxix (1892), and in the first part of a Russian work intended to treat all aspects of Permian geology, published in Warsaw, also in 1892. Three years later he visited the British Museum, with his equally accomplished wife, who always shared his labours, and there he compared his Russian fossils with the corresponding shells from the Karoo formation of South Africa. The results of his researches were contributed to the Geological Society of London in a paper entitled "A Comparison of the Permian Freshwater Lamellibranchiata from Russia with those from the Karoo System of South Africa" (Quart. Journ. Geol. Soc., vol. li, pp. 337–51, pls. xii, xiii, 1895).

While in London, Professor and Mrs. Amalitsky also studied the Karoo reptiles and other Permian and Triassic fossils. They then spent four seasons in exploring promising localities in the Permian region of the northern Dwina, and discovered not only more freshwater shells but also the characteristic *Glossopteris* Flora and great deposits of concretions containing the skeletons of Reptiles and Labyrinthodonts. In 1899 and 1900, with the aid of funds from the Russian Ministry of Public Instruction, they made extensive diggings in the beds of bone-bearing concretions and obtained a very large collection which was sent to the University of Warsaw. Skeletons of Pariasaurians proved to be especially abundant, and there were numerous remains of Dicynodonts, Theriodonts, and Deuterosaurians, besides well-preserved Labyrinthodonts. In December, 1899, Professor Amalitsky made a general report on his first year's official work to the Imperial Society of Naturalists of Petrograd, and published this as a separate pamphlet at Warsaw in