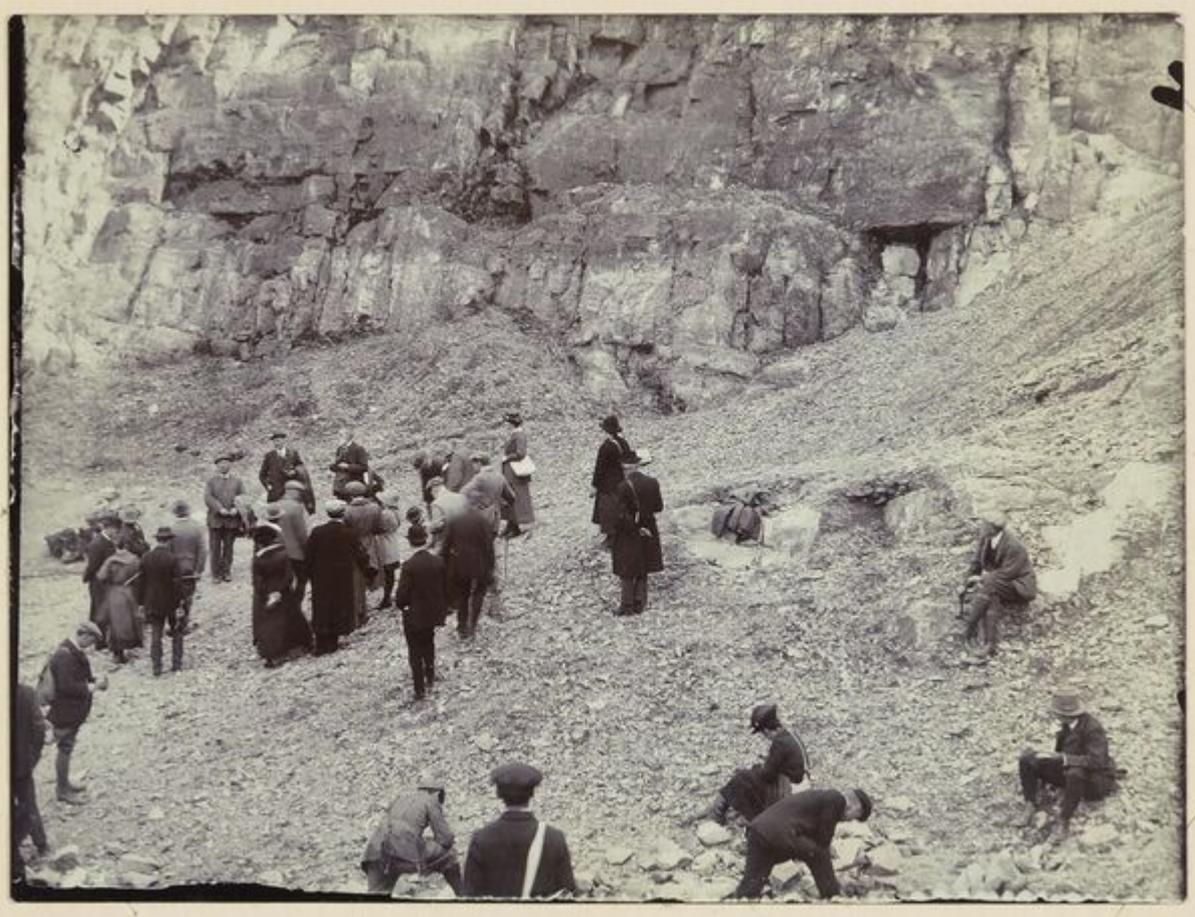


Excursion to Bristol District, Easter, 1919. Wednesday, April 16th, to Wednesday, April 23rd - Geologists' Association excursion

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[Jump to navigation](#) [Jump to search](#)



□

Contents

- [1 Link to Album and Photograph index](#)
- [2 Geologists' Association Circular No. 216. Session 1919-1920. p. 3-8](#)
- [3 Excursion to Bristol District, Easter, 1919. Wednesday, April 16th, to Wednesday, April 23rd \(Transcription from: GA Circular No. 216. Session 1919-1920. p. 3-8\)](#)
- [4 Wednesday, April 16th.](#)
- [5 Thursday, April 17th. The Silurian and associated igneous rocks of the Tortworth Inlier](#)
- [6 Friday, April 18th. Carboniferous Limestone of the left bank of the Avon](#)
- [7 Saturday, April 19th. Burrington and Cheddar](#)
- [8 Monday, April 21st. Lower Lias and Coal Measures of the Radstock district](#)
- [9 Tuesday, April 22nd.](#)
- [10 Wednesday, April 23rd. Carboniferous Volcanic Rocks of the Weston-super-Mare district](#)
- [11 Maps](#)
- [12 References](#)

Link to Album and Photograph index

To view photograph album:

[Geologists' Association Carrecek Archive. The Reader Geological Photographs Long Excursions 1919.](#)

To view detailed index of photographs taken on this excursion:

[T W Reader geological photographs, long excursions 1919 - index, GA 'Carrecek Archive'](#)

Geologists' Association Circular No. 216. Session 1919-1920. p. 3-8





Excursion to Bristol District, Easter, 1919. Wednesday, April 16th, to Wednesday, April 23rd (Transcription from: GA Circular No. 216. Session 1919-1920. p. 3-8)

Directors, Prof. S. H. REYNOLDS, Sc.D., F.G.S. and J. W. TUTCHER.

Excursion Secretary, B. A. BAKER, F.G.S., 38, Queen's Square, Bristol.

Wednesday, April 16th.

Leave Paddington, 4.0 p.m. Arrive Bristol, 6.30 p.m. Fare, 14/8 Single.

HOTEL ARRANGEMENTS.—The following is a list of Hotels available. Members should book their rooms as soon as possible, saying they are members of the Association :

Grand Hotel, Broad Street-13/6 per day. *Headquarters.*

Lyndale Hotel, Berkeley Square, Clifton-11/6 per day.

Talbot Hotel, (Commercial), Victoria Street-10/- per day.

Central Hotel, Park Street-8/6 per day.

Members intending to take part in this Excursion should at once communicate with Mr. BAKER, enclosing a stamped addressed envelope or postcard for reply. Members should take lunch with there each day.

Prof. REYNOLDS will, if desired, give a Lantern Lecture on the Geology of the Bristol district on Thursday evening, at the University. An exhibition of specimens will be arranged in the geological department of the University, to which members of the party will have access. Special attention is directed to the splendid geologically coloured model of the Bristol district in the City museum.

A general account of the Geology of the Bristol district will be found in chapters 14 and 15 of "Geology in the Field," the Jubilee volume of the Geologists' Association. A briefer account entitled 'A Sketch of the Geological History of the Bristol district' was published in the Proceedings of the

Bristol Naturalists' Society in 1909, and a similar account, with details concerning the excursions will be found in "A Geological Excursion Handbook for the Bristol district" (published Arrowsmith, Quay Street, Bristol, 3/6), which members are recommended to get.

Thursday, April 17th. The Silurian and associated igneous rocks of the Tortworth Inlier

Director, Prof. S. H. REYNOLDS.

Leave Bristol (M.R.), for Charfield by the 10.30 train arriving 11.29. Fare, 2/1½. (Single ticket).

The railway traverses the northern part of the Bristol coalfield, a synclinal fold enclosed by a rim of Carboniferous Limestone, which is penetrated by the tunnel S. of Wickwar.

On arriving at Charfield, drive to the old quarry (Cullimore's) north of the station. Here the upper of the two bands of "trap" (a somewhat ill-defined amygdaloidal rock probably to be classed with the spilites) is exposed, and resting on it is a band of fossiliferous calcareous tuff of late Llandovery or early Wenlock age.

The Silurian rocks are now hidden for a space by the Trias, but reappear at Avening Green, the next spot to be visited. Here the upper band of trap is interesting as containing quartz xenocrysts, and an exposure of Llandovery has been opened by the kindness of Lord Ducie. Walk then along the Little Avon to Damery. Here are a small quarry in fossiliferous Llandovery, and a large one in "trap." Drive on to Middlemill, where a small exposure of fossiliferous limestone with large lapilli rests on the trap. Rejoining the brakes, drive southward along the western part of the inlier to the Wenlock quarry at Whitfield where many well-preserved fossils have been found. Return to Charfield through Tortworth Park, by the kindness of Lord Ducie, and after tea at the Railway Tavern take the 6.34 train to Bristol (due 7.28). Cost of drive,

REFERENCES.—12, 22, 26, 27, 35, p. 200.

Friday, April 18th. Carboniferous Limestone of the left bank of the Avon

Director, Prof. S. H. REYNOLDS.

Leave hotel at 9.30 and take tram at the Centre as far as Dowry Square. Cross the Swing Bridge at the entrance to the Floating Harbour, and the New Cut by the Clifton Bridge Ferry.

Follow the section in descending order. The higher beds —*Dibunophyllum* and Upper *Seminula* Beds—are seen in duplicate being repeated by the Observatory Hill fault, but the exposures in the series as repeated are not good on the left bank. The following are the horizons to which special attention will be paid :—

1. D₁ very fossiliferous seen in the riverside exposures.
2. S₂ poorly exposed in quarry 5, well seen in the riverside exposures. The well-known Concretionary beds' have recently proved to be largely of algal origin.
3. S₁ exposed, but not too well, in quarry 4.
4. C. The upper C beds (laminosa-dolomites) are well exposed in quarry 3, but are not easily accessible. The massive beds of the Caninia-oolite are finely seen in quarry 3.
5. Z₂ is well exposed in quarry 2, and

6. Z₁ in quarry 1 ; both are very fossiliferous.
7. Very little is seen of K₂, but K₁ and Km the passage beds to the Old Red Sandstone are well seen and fossiliferous in the riverside exposure at the end of the section.
8. The upper beds of the Old Red Sandstone.

REFERENCES.—3, 11, 19, 21, 24, 25, 34, 35, p. 41.

Saturday, April 19th. Burrington and Cheddar

Director, Prof. S. H. REYNOLDS.

Leave Bristol (G.W.R.) by the 9.30 train, arriving Burrington, 10.41.

Fare, 2/5½ (Single).

In this excursion the Black Down pericline, the most westerly of the four forming the Mendip Hills will be crossed, and the two splendid gorges of Burrington and Cheddar traversed. The interest of this excursion is partly stratigraphical, affording an opportunity of comparing the Mendip development of Carboniferous Limestone with the Avon section, partly physiographical, illustrating the gorges, caves and swallets characteristic of a district formed of massive limestone.

The Burrington section will be examined in descending order. The upper beds (*Dibunophyllum* and *Seminula* beds) are not very well seen, and do not differ materially from those of the Avon. The *Syringothyris* (C) beds are finely exposed and consist mainly of massive limestone, the dolomites which are so extensively developed in the Avon section on this horizon being comparatively thin. The lower part of the *Syringothyris* beds (C₁γ) and the whole of the *Zaphrentis*-zone are highly fossiliferous. As far as the upper part of the *Zaphrentis* zone the Combe follows the line of dip fairly closely, but it now bends sharply to the east and runs approximately along the line of strike, being bordered on the north by a fine escarpment. Near here two small valleys lead into the Combe, both of them being occupied by streams which disappear into swallets before reaching the main valley. Each stream gives a section from Z₁ to the O.R.S. Enter the mouth of the western valley, where there is good collecting ground for Z₁ fossils, then cross to the eastern stream, passing the mouth of the Goatchurch cave *en route*. In the eastern stream the lowest *Cleistopora* (K) beds are well seen. Continue to ascend the stream, cross the O.R.S. moor of the top of Blackdown and walk to the top of the Cheddar gorge. The Cheddar gorge to a great extent follows the strike of the rocks, and the section is by 'no means so extensive as at Burrington, being mainly in the *Seminula*-zone. It is hardly likely that much time will be available for examining the rocks, and the magnificence of the gorge can best be appreciated if the path along the top of the cliffs is followed. Near the mouth of the gorge are the famous Cheddar caves, and the Cheddar stream may be noted issuing from an opening at the base of the cliff.

Tea will be provided at the Cliff Hotel (1/3 each) and the return to Bristol made by the 5.4 train, arriving Bristol 6.23. Fare, 2/9. Walking distance about 5 miles.

REFERENCES.—17, 20, 23, 25, 30, 33, 35, pp. 106 and 113.

Monday, April 21st. Lower Lias and Coal Measures of the Radstock district

Director, J. W. TUTCHER.

Leave Bristol (G.W.R.) at 10.10, arriving Midsomer Norton and Welton at 10.56. Fare, 1/10 (Single).

Visit first the Bowldish quarries in the Lower Lias, which lie about $\frac{3}{4}$ -mile N. of the station. Here the *Sauzeanum*-zone is very fossiliferous, and from it the finest specimens of *Spiriferina Walcottii* have been obtained. The *raricostatus* and *armatus* zones are also present. Walk on to the Clan Down quarries, about a mile further east. These show good exposures of the *armatus* and Jamesoni-zones, and at the Colliery near by Coal Measure plants may usually be found in abundance. Descend the hill to Radstock, and passing through it, visit two quarries $\frac{3}{4}$ -mile south of the town. These exhibit all the Sinemurian and Hettangian deposits represented in the Radstock area, together with some lower Charmouthian. The *raricostatus* beds are especially rich in fossils at these quarries.

After tea (1/3) at the Bell, return from Radstock (G.W.R.) by the 5.14 train, reaching Bristol at 6.17. Walking distance about $4\frac{1}{2}$ miles.

REFERENCES.—1, 2, 8 and 35, pp. 152 and 160.

Tuesday, April 22nd.

Director—Prof, S. H. REYNOLDS.

Morning—Portishead.

Leave Bristol by the 9.50 train arriving Portishead 10.27. Return fare, 2/10 $\frac{1}{2}$.

The most interesting rocks to be examined on this excursion are the Old Red Sandstone and Dolomitic Conglomerate (base of Trias). Many instructive examples of structural geology will be seen. Walk to Portishead Dock station noting Dolomitic Conglomerate unconformable on the O.R.S., and near by on the Carboniferous Limestone, which is faulted against Pennant Grit. Walk to Battery Point where the lower *Zaphrentis* and upper *Cleistopora* beds are seen, the latter being folded into a remarkable series of little anticlines and synclines. At the southern end of Woodhill Bay a fine section of the O.R.S. begins, several Ethological types are met with, shale, mudstone, conglomerate and cornstone, while ripple marking and other evidence for accumulation in shallow water is well displayed. Several faults traverse the rocks and the Dolomitic Conglomerate is seen resting with strong unconformity on the O.R.S.

REFERENCES.—6 and 35, p. 74.

Afternoon—Aust.

Return to Bristol by the 1.10 train arriving 1.49.

Brakes will meet the party at the station for a drive to Aust which should be reached at about 4.0.

After tea visit the fine section of Keuper and Rhaetic rocks. The section forms a gentle anticline the upper beds being accessible only at the southern end. Several faults traverse the strata and each brings in a patch of Lower Lias which owing to its resistant character is responsible for the little promontory which accompanies each fault. All the horizons can be readily examined in fallen blocks. The Bone Bed for which the Aust section is so famous is a discontinuous band. The lower part of the Keuper series in the core of the anticline is noteworthy for the abundant gypsum and for a layer containing pseudomorphs after rock salt. Drive back to Bristol arriving about 8.0. Cost of drive.

REFERENCES.—4, 16, 28, 35, p. 183.

Wednesday, April 23rd. Carboniferous Volcanic Rocks of the Weston-super-Mare district

Director: Prof. S. H. REYNOLDS.

Leave Bristol by the 9.36 train, arriving Weston 10.30. Return fare, 4/9.

Drive to Spring Cove, where a bed of basaltic lava about 35 feet thick is interbedded in the *Syringothyris*-beds (top of C₁). It has been described in detail by Prof. W. S. BOULTON, who pointed out that the basalt mass is by no means a simple lava flow. It may be divided into three portions. Beginning at the cliff end, the rock for the first 30 yards is a pillowy lava., then for a middle region of about 20 yards it is a coarse agglomerate with large lumps of limestone. and appears to be of the nature of a fluxion tuff. Finally, for the remaining 100 yards or so, it is an ordinary basalt flow with smaller lumps of burnt limestone. in all cases the limestone appears to have been picked up by the lava, not introduced subsequently from above.

After driving through Kew Stoke Wood, leave brakes and walk across Sand Bay to the Woodspring promontory, which consists of a southward-dipping mass of Carboniferous Limestone, ranging from Z₂ to C₁ and including an igneous development in horizon γ (that of overlap between Z and C), i.e. at a lower level than at Spring Cove. There are four sections of the igneous series, the westernmost section, where the series is about 100 feet thick, and includes a bed of lava as well as tuff, being the finest. The second and third sections, which lie close together at a distance of rather more than a mile from the first, show only tuff, the lava flow not occurring. The Carboniferous Limestone rocks associated with the igneous series are highly fossiliferous.

After visiting the third section, walk to Woodspring Priory where tea will be provided. Drive back to Weston via Worle, visiting en route a quarry at the western end of Worle Hill where the *Seminula*-beds are overfolded owing to a reversed fault, which, running the whole length of Worle Hill brings the *Syringothyris*-beds on the south over the *Seminula*-beds on the north. Return to Bristol by the 6.53 train arriving Bristol 7.20. Cost of drive, Motor for 20 persons, £4. The same train leaves for London at 7.30, arriving 10.30. Members therefore returning to London the same night should take their luggage to Weston in the morning and leave it in the Cloak Room.

REFERENCES.—10, 13, 14, 15, 22., 25, 35, pp. 87, 94, and 36.

Maps

GEOLOGICAL.—The index map scale 4m. to 1 in., sheet 11, covers the whole district.

The sheets of the old 1 in. Survey required are : For use on April 19th and 21st, sheet 19 ; for use on April 17th, 18th and 22nd, sheet 35 ; for use on April 23rd, the revised map, colour printed, sheet 263.

Bartholomew's ½ in. to mile contoured map, sheet 28, Bath and Bristol district, is very useful (price 2s.).:

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Category:

- [Geologists' Association excursions](#)

Navigation menu

Personal tools

- Not logged in
- [Talk](#)
- [Contributions](#)
- [Log in](#)
- [Request account](#)

Namespaces

- [Page](#)
- [Discussion](#)

Variants

Views

- [Read](#)
- [Edit](#)
- [View history](#)
- [PDF Export](#)

More

Search

Navigation

- [Main page](#)
- [Recent changes](#)
- [Random page](#)
- [Help about MediaWiki](#)

Tools

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Permanent link](#)
- [Page information](#)

- [Cite this page](#)
- [Browse properties](#)

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