NORTH STAFFORDSHIRE

Anturalists' Field Club

ARCH DY OGIC. L SOCIETY.

ANNUAL SEPORT.

1880.

#### NORTH STAFFORDSHIRE

# Maturalists' Field Club

AND

## ARCHÆOLOGICAL SOCIETY.

1880.

EARL, ESQ.

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MR. E. BI UN'

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HANLEY,

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... MR. T. TURNER,

.. MR. J. KIRKBY,...

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MR. A. LEECH.

MR. A. M. MC ALDOWIE, M.D.

MR. J. G. R. POWELL.

MR. J. G. U. WEST.

## EXCURSIONS AND EVENING MEETINGS, 1880-1.

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EXCURSIONS.	Leader.
1.—Tuesday, April 20, Colwich and Cannock Chase, with the Stafford Institute and Field Clab	Mr. Molyneux.
2.—Saturday, May 2. Marple, with the Manchester Clubs	Mr. Potter.
3.—Saturday, June 19, Store and Bury Bank	Mr. Woolley.
4.—Friday and Saturday, July 16 and 17, Coventry, Kerilla orth, &c	Mr. Wardle.
5.—Friday, August 20, A.to. and Oakam or	.Mr. C. L. Wragge.
6.—Saturday, September 18, Cat and Fiddle	.Mr. Kirkby.
7.—Tuesday, October 19, Chester	.Mr. Lynam.

CV	- Cx
EVENING MEETINGS.	Local Secretary.
1—Thursday, November 18, Hanley	Mr. A. Smith.
2—Thursday, January 20, Burslem	Mr. A. Ellis.
3—Thursday, February 17, Leek	Mr. Brough.
4—Thursday, March 17, Stoke—Annual Meeting.	Mr. Kirkby.

The Treasurer in Account with the North Staffordshire Naturalists Field Club and Archæological Society.

## BALANCE SHEET FOR THE YEAR 1879.

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To	Balance i	n hand	•••				19	9	(8)	Allbut and Daniel for Periodicals	•••	10	14	0
,,	Hanley S	ubscript	ions		•••		12	5	0	cily orth for Printing, &c	•••	45	15	0
,,	Newcastle	e Subscr	iption	s, 1878			10	0	0	Expenses of Stoke Meetings		5	8	0
,,	do.	do.		1879			12	5	0	Do of Hanley Meeting		1	10	0
,,	Longton	do.		•••			5	10	0	Do of Summer Excursions	•••	2	6	0
,,	Leek	do.					4	15	0	Telegrams an Postage of Circulars, &c.	• • • •	1	4	6
"	Burslem	do.		1878			8	5	0	Lyrenses of Lurdem Meeting	•••	3	8	0
"	do.	do.		1879			7	0	0	Balance in hand	•••	24	9	2
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## REPORT

Read Ite Tifteenth Annual Meeting, held at Stoke-on-Trent, on Thursday, March 18th, 1880.

It is a source of no little gratification to your Committee that they are able once more to present a favourable Report of the proceedings of the North Sta Cordshire Naturalists' Field Club and Archæological Society. The Clab has now been in existence fifteen years, and this is, therefore, the afteenth annual meeting. be then no surprise to helpbers that your Committee find it difficult after so many years to give much variety to their Reports. No doubt each year has its distinctive flatures, but it is not always easy to point them out in a concise manner, and yet so as to create an interest in the history of the past season What shall we say then in this our Fifteenth Report? The Excursion of the Sam ner months were all held as arranged, with the exception that in two instances the date was altered to suit the convenience of certain members who wished to be present. With regard to the Evening Merings, an alteration of date was made in two out of three of them for good and sufficient reasons, but this was not the only or the chief alteration: the meeting announced for Leek was put off sire die in deference to the wishes of the Leek members, and instead it a meeting was somewhat hastily arranged for Newcastle; having. however, the hearty concurrence of the local Secretary and Treasurer, it proved a very successful and interesting evening. Perhaps it deserves notice that the Excursions have been attended, much better, indeed, than in the previous season. Evening Meetings, however, which have almost always succeeded in drawing together a considerable number of members, have not been largely attended this Winter; not, your Committee are willing to believe, from any want of interest on their part in the proceedings, nor as they are perfectly satisfied from any falling off in the arrangements or in the efficiency of the papers, but probably bad weather will account for the short attendance at Hanley and Newcastle; the chief drawback, however, is the impossibility of

#### SECTIONAL REPORTS.—No. I: GEOLOGY.

As a prelude to the work of the section, a meeting, attended by most of the old members, was held at Stoke in March.

Arrangements were made for fortnightly excursions, at which it was decided to make a detailed examination, as far as possible in some ence, of some definite portion of the district. For this purpose the Etruria valley, with an extension to Hanford, was taken as the fine, the ground lying immediately W. of this, consisting principally of Red Marls belonging to the Upper Coal Measures, being selected for examination.

The first excursion was taken on the 8th April. Meeting at Stoke, the men per first examined, by the courteous permission of the proprietors, the first examined, by the courteous permission of the proprietors, the first examined in section in the London Road Tile Works, at expone being paid to the position of the strata and the nature of the intercalated beds. They next proceeded to Penkhull where the red substances of the Permian group were noticed in several roadside exposures on the brow of the hill, marking the boundary line of the Permian in this direction. On crossing the village other small sections of the same formation were observed, and were examined for the purpose of obtaining data for the determination of for conformation by with the subject coal measures.

The second excursion on Ar.il 24th was deceted to an examination of the Red Marls, exposed in different sections along the W. flank of the Etruria valley, as far as Rasford. An attempt was also made to define the long line of fault which intersects the measures in this locality, and to ascertain the width of the overlying strip of Permian contiguous to the fault.

On the 8th of May the examination of the Red Mar's was continued from Etruria northwards, two gullies opening into the valley, which were inspected in passing, giving sections of coameasure sandstone shales of some extent.

The weather prohibiting the excursion arranged for the 22nd May, some time was spent by the few members who met in comparing a series of proximate analyses of allied beds in different sections of the marls, kindly undertaken by Mr. Goss to ascertain their continuity.

The next excursion on the 5th June was made from Stoke, and during it the investigation of the Red Marls was continued in the direction of Hanford. Several good sections were visited, the position and nature of the different strata being examined with considerable care. The line of fault extending several miles in a

#### EXCURSIONS.

I. FROGHALL AND CAULDON LOW, TUESDAY, APRIL 22ND, 1879.

This was the First Excursion of the Season, and it was well attinged appeared of fifty members being present. The weather was no point in on the whole, although the sky became overcast in the aftern on and towards evening a slight rain fell for about half an hour. The Club was, on this occasion, once again met by the Dudley and Midland Geological and Scientific Society.

The appointed coulity was Cauldon Low, where are the vast limestone quarries which wher t ale is brisk, supply the ironmasters of North and South Staffordshire ...th something like a quarter of a million tons of limestone per year, to be used in their blast furnaces as a fluxing agent. At Uttoxeter junction the remers were joined by a contingent from the Dudley Society, which raised the strength of the party to about 80. The leader for the day was Mr. J. I. Rigby, of Leek, and Mr. W. Molyneux, F.G.S., was announced to read paper on the geological features of the district, but an urgent business engagement prevented him from doing so, much to the disappointment of the party.

On arriving at Froghen the party were must shewn the Crushing Mill, On arriving at froght it to party were in at snewn the crushing Mill, where the limestone is cruded, after being by ought down from the Quarry on the train, and thence deposited in the railway trucks. Then taking their seats, the ladies in two carriages specially fitter or for the directors and their friends, the gentlemen on or are thrown a ross the ordinary mineral trucks, the ascent up the inclination, which is three miles long, commenced. About two miles up the transition from the millstonage it formation to the mountain limestone is well marked. There are several tunnels on the upper portion of the incline, most of them so low as to require considerable precaution on the part of the visitors lest their heads should str ke the roof. It is only due to Mr. Fraser, the manager, to say that on this, we or several former occasions, he was most courteous and attentive, and spared ro pains to make the visit an interesting one, and to secure the comfort a d safety of the party. For the gratification of the visitors, preparations had been made for firing a "shot" of nine hundred-weight of powder. Immediately on the arrival of the party they were halted at a distance of about a thir of a mile from the working face of the Quarry, and the fuse was lighted. It burnt about a quarter of an hour, and then a great mass of rock slowly bulged outwards, and toppling over, fell with a thundering roar on to the floor of the Quarry. It was estimated that this shot brought down from six to eight thousand tons of limestone. Many of the larger fragments resulting from these great blasts weigh from one to three tons, and these are shattered by charges of gunpowder inserted in holes drilled for the purpose. In this way several rattling and irregular salvos were fired in the course of the day. In the limestone are to be found good examples of Productus Sublœvis, and two species of Bellerophon and Euomphalus. The high table land on which the Quarries are situated commands extensive views of the moorlands of North Staffordshire, and when the visitors had made a thorough inspection of the Quarries they lingered for a while on

### EVENING MEETINGS.

1. HANLEY EVENING MEETING,

THURSDAY, NOVEMBER 20, 1879.

fist Evening Meeting of the season of the Members of this Clul was held in the Queen's Hotel, Hanley, on Thursday Evening. The inclement weather prevailing militated against a large attendance. As usual, the table was covered with a rich store of antique or resities, natural history specimens, and interesting books, which the a dience inspected with much pleasure. The largest contributor was Mr. E. Brunt, who supplied a valuable collection of ancient books documents, and maps, with some choice works of a modern date. The collection of Mr. Brunt included several old Staffordshire m.p. from the time of Elizabeth to the year 1747, a parchm in scroll containing particulars of the Audley estates in the 16th century, a deed cated 1750 relating to some property in Hanley (described as "Healey Green"), and signed by Mrs. Bagnall, then lad of the manor on Act of Parliament of 1735 in reference to the surpike road from Tittensor to Talke; an Act of William III. providing for the coas ry new of the Trent; reports of state trials in 16 8-6, of the trials of the Earl of Macclesfield in 1725, and of Earl F .. rers in 1 66; an account of the trial and condemnation at Starford Assice of two "papish priests," published in 1679; a work printed in 1650 in "The Temple," by John Lightfoote, a native of Stoke; a file ony of the first edition of Fuller's "Worthies;" Willis's History of Lichfield and Chester Cathedrals with choice illustrations (1873); documents bearing the signatures of English sovereigns from the time of Elizabeth to the present reign; and numerous other ancient and curious books and documents possessing local interest. Mr. A. Smith exhibited some cases of butterflies and moths; the President (the Rev. T. W. Daltry) some rare botanical specimens found by him during the past season; Mr. Osmond supplied geological specimens; Mr. A. Scrivener rubbings from the Erdeswicke monuments in Sandon Church, which are dated 1500 and 1596; Mr. W. P. Baildon specimens of North American Indian fancy work and other articles; and Mr. Tallent Bateman some well-preserved volumes printed at remote dates.

The President, on taking the chair, referred to the illness of Mr. Garner, and said that although he disclaimed the title of "the

"ON THE SUMMER OF 1879 IN THE VICINITY OF THE STAFFORDSHIRE MOORLANDS AND CHURNET BASIN" FROM OBSERVATIONS TAKEN AT FARLEY, NEAR CHEADLE,

 $\mathbf{B}\mathbf{Y}$ 

CLEMENT L. WRAGGE, F.R.G.S., F.M.S.

Mr. Chairman, Ladies, and Gentlemen,

inspection of the chart of the weather I have prepared to illustrate the orbest of my remarks this evening will show you, far better than the reading of a long paper full of meteorological statistics in minute detail, the most ur our ner-like character of the Summer of 1879 as it was experienced in the Morlands District of North Staffordshire. I should mention first that my station is inspected by an officer of the Meteorological Society; that it enjoys the benefits of an almost perfectly free exposure, that the instruments are all official standards, and that their readings are therefore strictly e.act, or according to the applied corrective values furnished on the cert. it ates from Kew Observatory. The thermometers, dry and wet bulbs and have mum and minimum, are exposed in Stevenson's screen four feet above the ground and 641 feet above mean sea level. Only the readings of the world last appear on the chart as they suffice for the scope of my present paper. The barometer is a Board of Trade instrument, hanging 643 feet above re sea. The standard rain gauge has a diameter of eight inches standing about a foot above ground and 638 feet above sea level. My status is also ear and with additional rain gauges. above sea level. My station is also equipped with additional rain gauges, and self-registering the mometers; a so ratiation and earth thermometers, but the readings of these instruments are not necessary for my present purpose and would only on, licate the chart. I propose now that we take together a general survey of the diagram of ting the most remarkable features, and then 1 will pass under review eac't month beginning with June and ending with August in the form of a concise synopsis. Looking at the third element on the chart we notice an entravagant register of cloudy skies. Immediately above the cloud lines on the diagram we observe a more than full complement of depessions in the barometric curve, agreeing well with the dark shading of he loud, shallow indeed when compared with those of the preceding winter, but serious enough when we consider the enormous amount of rain that accompanied them with all its disastrous results to our farmers and the crops. But perhaps he most striking feature on the chart is marked on the temperature cr. ve. for during the whole so called summer we see that only four times, twice in July and twice in August, did the maximum thermometer register ove 70 degrees, and the value 76 was never reached during the entire period of three months under consideration.

JUNE.—Atmospheric Pressure.—Highest reading of barometer (at 32·F) 13th, 29·464; lowest, ditto, 16th and 21st, 28·796; monthly range 0·668.

Temperature (shade).—Maximum, 5th or 17th, 65.5 or 65.3 (the former value for 5th with a little caution); minimum, 5th, 38.0; monthly range (close approx) 27.3.

Rain from 1st of June 9 a.m. to 1st. July 9 a.m., 6.423 inch, or 6484 tons to the acre.

June was really a spring month. The hawthorn, so well known as the "May," was not in flower in the lower moorlands till the end of the month, and in the neighbourhood of the Weaver Hills it was much later as I shall shew when I come to speak of July. Nevertheless June ordinarily being the first summer month it is included in my paper, and we will now

NOTE ON THE AMOUNT OF OZONE PRESENT IN THE ATMOSPHERE OF THE STAFFORDSHIRE MOORLANDS AT A MEAN ELEVATION OF 650 FEET ABOVE MEAN SEA LEVEL,

[October 1879 to January 1880 inclusive.]

 $\mathbf{B}\mathbf{Y}$ 

CLEMENT L. WRAGGE, F.R.G.S., F.M.S.

In following contribution must be merely regarded as a note, not as a full paper. Only recently have I been observing for ozone, and as the result is the dy very interesting I wished to bring my investigations under the notice of the North Staffordshire Naturalists' Field Club. A word first, by way of introduction, as to the nature of ozone. The most recent researches have determined that it is merely oxygen in a different form, and possessing diferent properties and physical characteristics. oxygen of the air con wist in two conditions, and in the one in which chemical activity obtain a poculiar odour is emitted, hence the name Ozone. It is, however, in its influence on health and in the matter of determining the peculiarity of climate at the different places famed as health resorts that it comes under the notice and within the province of meteorological observers. It is believed to be a very strong disinfectant; it is in fact the most powerful one known; and the ice it becomes a great and valuable purifier of the air and recessary to health inasmuch as it unites with the noxious vapours and effects of decaying matter and deprives them of their injurious qualities. It in excess it is b lieved to be somewhat detrimental, injurious qualities. It in excess it is b lieved to be somewhat detrimental, and is then thought by some to be the cause of colds, influenza, and other such complaints; at least such a belief has resulted from the investigations carried on during last year. It has been round in greater quantities in the neighbourhood of the sea loas, and also in elevated districts. It prevails more in the West than in the East of these Islands owing to proximity to the Atlantic; and a greater amount is sufficiently found when a S. Why or Westerly gale is blowing than with winds from the other quarters. Such latter is my experience, and find that in the weather it is on some occasions entirely absent. On others a more tinge of colour affects the test namers of which I will speak immediately. The observers affects the test papers of which I will speak immediately. The observers of the Scottish Meteorological Society have found that ozone in greater amount from February to June when 60 is the average amount and is found in less abundance from July to January when 5.7 is the mean The method employed for observing ozone is simple in the amount. extreme. Prepared test papers, on which it acts, causing discoloration, have merely to be exposed to a current of air, and the papers defended from rain and sunshine. The amount is gauged by the extent of discoloration produced, and the scale is 0 to 10. Mr. Buchan, the Secretary of the ation produced, and the scale is 0 to 10. Mr. Buchan, the secretary of the Scottish Meteorological Society, gives the following mode of preparing the tests:—Take 200 parts of water, 10 of starch and 1 of iodide of potassium and boil all together for a few seconds. A sheet of thin absorbent paper is then dipped in the solution, and when dry cut into strips. Care must be taken to prevent the test becoming wet during exposure. I now call your attention to the chart I have prepared shewing the result of my observations from the 7th of October to the end of January last. I have never resistered the full amount. 10 at, my Observatory and consider that 8 is registered the full amount, 10, at my Observatory and consider that 8 is the maximum for the Moorlands District, and when this is found we see that S. to S.W. to W. winds have been the agents; take for instance the 20th October, 28th December, and 4th January. The white line across the diagram marks off, what I consider, the half of the scale for my district. Let us now glance at the number of times 7, or 7.5 occurs, viz., 17th, 19th, and 24th October; and 7th, 10th, 12th, 18th, and 21st November. S.-Wly

#### ANNUAL MEETING.

Uja STCKE-UPON-TRENT, THURSDAY, MARCH 18, 1880.

The Fifteenth Annual Meeting was held in the New Hall of the Station Hotel. The chair was taken by the retiring President, the Rev. Thos. W. Daltry, M.A., J. S., and there was a large attendance of members, upwards of eighty being present at one time of the evening or another

The objects exhibited on the table. was more numerous than is usual at the Annual Meeting, and were of unusual interest. Mr. Thomas Bolton, F.R.M.S., of 17, Ann-str et. Birmingham, attended with a splendid collection c. I ring micros opic objects, which were exhibited in three powerful bur cular micros opes belonging to Mr. Bolton, and two binoculars belonging to 1 en bers. other wonders was a young trout, this quarters of an inch long, with a portion of the yolk of the egg still attached to the lody, and on which yolk the little creature will live for some weeks of ome, should it survive its removal from its natural habitat. The heart was seen pumping the blood from the surface of the yolk and drawing therefrom the fat globules which constitutes the ford. The blood was also seen in circulation round the eyeballs. tadpoles showing the circulation of the blood were also exhibited, together with Volvox globator, Stephanoceros Eichornii, Hydra vulgaris, Daphnia reticulata, and many other objects. Mr. Bolton exhibited in addition a complete and beautifully-mounted collection of British seaweeds. The microscopists among our readers may be glad to be informed that Mr. Bolton conducts an agency for the weekly supply of living specimens of protozea, entomostraca, rotifera, &c. Mr. Kirkby, local secretary, lent numerous Japanese and Hawaiian curiosities. Mr. Goss, old pottery and illustrated books. Mr. Ward, fossils from the coal measures, including sections showing the internal structure of the trees of the coal epoch. Mr. Cherry several assegais from Zululand, and Dr. M'Aldowie a col-

## NOTES ON SOME FOSSIL TREES IN A MARL PIT AT JOINER'S SQUARE, NEAR HANLEY.

BY J. WARD, F.G.S.

The President having announced his intention of departing from the custom usually followed at our Annual Meetings of delivering a Presdential Idress, I have consented to fill up the vacancy, and shall avail myself of he opportunity which presents itself, of bringing before your notice the o scorery of a number of fossil trees which have been brought to light aux not the past few months.

Man of the members present to night will no doubt remember a special excursion which the Club made in August, 1869, to Joiner's Square, near Hanley, at the invitation of R. Stevenson, Esq. The object of the excursion was more particularly for the purpose of examining a fossil tree standing at the latter of a marl pit belonging to Messrs. Hampton, which had been uncolored luving the progress of the workings.

A large number of members availed themselves of the opportunity afforded them of examination, the tree, and great interest was manifested in the discovery. After purking of Mr. Stevenson's hospitality in the shape of a substantial tea, we had the pleasure of listening to a most interesting paper by Mr. J. E. Doris, V.P., on "Rambling thoughts in a Hanley Marl Pit." The author of the paper, after referring to the common application of the wood "marl," went on to describe in popular language the mode in which the state of our coal measures had been deposited. After noticing the erect position of the tree, he proceeded to describe some of the nost prominent features which it presented. Referring to the tree, he said, "they must have appose from the size that they were pronouncing the forest ovation of an ancient monarch of the forest. They were not mour and over a venerable cedar or a slow growing oak. This so-called Calamite was a thirsty plant of fast growth, and supposed by Brongniart, to be allied to the Existance." In a paper which I afterwards contributed to the Club, I posted out that the flutings on the stem of the tree were characters not usually found on the stem of Calamites, but that such markin is were character is the of Sigillaroid trees.

Since the discovery of the specimen previously described, a lumber of fossil trees have been met with at various times. It was not vatil the early part of the present year that I had an opportunity of re-visiting the marl pit. In the month of May last, in company with the members of the Geological Class, I visited the marl pit, and found two specimens of fossil trees which had been recently uncovered. Since then, I have, on several occasions, visited the marl pit, and on each occasion found one or two frest specimens of fossil trees which had been uncovered during the interval of my visits.

Before proceeding to describe the specimens, it may be necessary to state that the deposit in which these fossil trees were found, are the well-known marls or fire-clays, which are so extensively developed in the Upper or Pottery divison of the North Staffordshire Coal-field. In addition to the fossil trees, numerous remains of plants occur throughout the whole thickness of the exposed beds; but the trees were, with few exceptions, found in situ, on a little bed of coal which occurs at the bottom of the marl pit. The strata is somewhat dislocated by a fault which renders it a task of some difficulty to determine the exact position in the Geological

<sup>\*</sup> North Staffordshire Naturalists' Field Club, Addresses and Papers. (Hanley, 1875.)



Forsil Bree.

Messre Mampton's Marl Pit.

MANCEY STAFFE. 1878.

#### ASSOCIATED SOCIETIES WITH WHICH THE NORTH STAFFORD-SHIRE CLUB EXCHANGES PUBLICATIONS.

Brighton and Sussex Natural History Society Burton-on-Trent Natural History and Archeeological Society Dudley and Midland Geological and Scientific Society I pping Forest and County of Essex Naturalists' Field Club Gusgow Natural History Society Good Scientific Society Yucker meld Literary and Scientific Society Hudders' ald Naturalists' Society Ipswich Scientific Society Leeds Naturalits' Club and Scientific Association Lewes and Last Seex Natural History Society Liverpool Naturalists' Field Club Manchester Field Naturalists' Club Manchester Geologica'. So iet7 Manchester Scientific Stadents' Association Marlborough College Natural History Society Northampton Natural History Society Severn Valley Natur lis's' Field Club Stafford Institute and Field Club Surv. United States Geological and Geographical Survey nopo

## LIST OF MEMBERS CORRECTED TO DECEMBER, 1880,

#### TOTAL NUMBER 318.

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Ashdown, Rev. G. B.A., Madeley

Ashwell, John B., N. we stle Ashwell, Hatfield, Longton Astbury, Miss Bessie, Sandon

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Lawton Coe, Jos. H., Norton-in-the-Moors

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