

**PROCEEDINGS  
of the  
CLEVELAND NATURALISTS'  
FIELD CLUB**

**1926 and 1927**

**VOL IV PART I**

**EDITED BY  
ERNEST W. JACKSON, F.I.C., F.G.S.**

**PRICE-THREE SHILLINGS  
(FREE TO MEMBERS).**

**MIDDLESBROUGH :  
H. & F. STOKELD.**

ANNUAL REPORTS, 1926/27, 1927/28

FIELD MEETINGS AND LECTURES, 1926/27, 1927/28

3. ARCHAEOLOGICAL EXCAVATIONS, 1927 (a) Whorlton, (b) Eston-F. ELGEE.

4. METEOROLOGICAL OBSERVATIONS AT MARTONIN-CLEVELAND, 1925/6/7-  
M. ODLING, M.A.

5. NOTES ON CLEVELAND IRONSTONE-

M. ODLING, M.A.

6. GEOLOGICAL OBSERVATIONS IN SLAG TIPS-

M. ODLING, M.A.

NATURAL HISTORY OBSERVATIONS

TEES MOUTH BIRD NOTES-C. E. MILBURN

LEPIDOPTERA IN CLEVELAND T. A. LOFTHOUSE

MEMOIR OF T. F. WARD-'-J. W. R. PUNCH

MEMOIR OF J. M. MEEK, M.A. J. W. R. PUNCH

12. MEMOIR OF W. G. Appleyard C. POSTGATE

13. FINANCIAL STATEMENT

Page 9-13-

15-30 31-35

49-54 55~ 61-63

64-73 74-76

80-81 82-83

CLEVELAND FIELD

NATURALISTS' CLUB,

**OFFICERS**  
**Elected at the Annual meeting, March 1927**

**President:**

STANLEY A. SADLER, J.P.

**Vice-Presidents :**

J. J. BURTON, M.I.M.E., F.G.S.    E. W. JACKSON, F.I.C., F.C.S., F.G.S.

MISS CALVERT.    T. A. LOFTHOUSE, A.R.I.B.A., F.E.S.

F. ELGEE.    J. W. R. PUNCH.

H. FRANKLAND.    M. L. THOMPSON, F.E.S.

**Committee :**

MRS. C. HOOD.    DR. ROBINSON.

PETER HOOD.    H. N. WILSON.

CHAS. POSTGATE.    MISS VERO.

**Hon. Secretary :**

M. ODLING, M.A., B.Sc., F.G.S.,

"Cherwell," Marton-in-Cleveland, Yorks.

**HOD. Treasurer:**

H. FRANKLAND, I, Argyle Villa, Whitby.

**Editor of Proceedings :**

W. JACKSON, F.I.C., F.C.S., F.G.S.

**OFFICERS**  
**Elected at the Annual Meeting, March, 1928**

**President:**

ALDERMAN STANLEY A. SADLER, J.P.

**Vice-Presidents :**

J. J. BURTON, M.I.M.E., F.G.S., J.P.    E. W. JACKSON, F.I.C., F.C.S.,  
F.G.S.

MISS CALVERT.    T. A. LOFTHOUSE, F.R.I.B.A., F.E.S.

F. ELGEE.    J. W. R. PUNCH.

H. FRANKLAND.    M. L. THOMPSON, F.E.S.

**Joint Hon. Secretaries:**

M. ODLING, M.A., B.Sc., F.G.S., " Cherwell," Marton-in-Cleveland, Yorks.

H. N. WILSON, A.I.C., Bedford Road, Nunthorpe, Yorks.

**Presidents :**

1906-Mr. H. SIMPSON. 1907-Mr. J. J. BURTON, F.G.S.

1908- Do.

1909-Mr. T. A. LOPTHOUSE,  
A.R.I.B.A.

1910- Do.

1911-Mr. J. W. R. PUNCH.

1912- Do.

1913-Mr. J. S. CALVERT. 1914-Mr. W. SACHSE. 1915-Mr. W. H. THOMAS.

1916- Do.

1917- Do.

1918-Mr. M. L. THOMPSON.

1919- Do.

1920-Mr. H. FRANKLAND.

1921- Do.

1922-Mr. FRANK: ELGEE.

1923- Do.

1924-MISS CALVERT.

1925- Do.

1926-Mr. E. W. JACKSON, F.I.C.,  
F.G.S.

**NAMES AND ADDRESSES OF MEMBERS. (The number shews the year of Election).**

Corrected up to March 31st, 1929.

- 1895-ADDISON, H., Wcodlands Road, Middlesbrough.  
1927-APPLETON, GEORGE, 7, West View, Grove Hill, Middlesbrough.  
1905-ALLISON, F. W., Church Square, Guisbrough.  
1928-ARNOLD, Rev. J., Gunnergate, Nurseries, Marton-in-Cleveland.  
1926-ATKINSON, J. H., Zetland Hotel, Saltburn-by-the-Sea.  
1881-BELL, Sir HUGH, Bart., Mount Grace Priory, Yorks.  
1922-BELL, Miss, 9, The Laurels, North Ormesby.  
1928-BoLCKOW, Miss D. M., "Brackenhoe," Marton-in-Cleveland.  
1929-BoLL, Miss S. F., M.Sc., 112, Oxford Road, Linthorpe, Middlesbrough.  
1925-BoWEs, G., B.Sc., 5, Hilda Place, Saltburn-by-the-Sea.  
1909-BRETT, E. P., Townend, Sawdon, Brompton by Sawdon, Yorks.  
1926-BRUNTON, Ivo, Rudds Arms, Marton-in-Cleveland.  
1928-BRUNTON, WM., Tollesby Farm, Marton-in-Cleveland.  
1928-BRUNTON, Mrs., Tollesby Farm, Marton-in-Cleveland.  
1910-BURNS, A. E., 1, Victoria Road, Saltburn-by-the-Sea.  
1929-BURSTALL, Mrs. N. E., II, Mill Lane, Billingham.  
1881-BuRTON, J. J., O.B.E., J.P., M.I.M.E., F.G.S., "Rose croft," Nunthorpe.  
1927-BRENNAN, Miss G., Chapel House, Dacre Street, Middlesbrough.  
1927-BURTON, C. H., "Tollesby Cottage," Marton-in-Cleveland.  
1927-BROWN, Miss M., "Ashleigh," Harrow Road, Linthorpe, Middlesbrough  
1928-BUTLER, G. B., F.C.S., A.M.I. CHEM. ENG., "Arnside," The Avenue, Marton-in-Cleveland.  
1928-BUTLER, Mrs., "Arnside," The Avenue, Marton-in-Cleveland.  
1889-CALVERT, Miss E., "Eastbrook," Saltburn-by-the-Sea.  
1911-CHARLTON, W., Martin's Bank, Middlesbrough.  
1920-CHARLTON, Mrs., Bank House, Grange Road, West Hartlepool.  
1926-CHAMBERS, GEO., Derwent House, Gipsy Lane, Nunthorpe.  
1927-CHISHOLM, Miss E., 32, The Avenue, Linthorpe, Middlesbrough.  
1928-COLLINSON, G. RUDD, B.Sc., M.Inst.C.E., F.G.S., "Gartheon," Marton-in-Cleveland.  
1927-CoLWELL, Mrs., I, Balfour Terrace, Linthorpe, Middlesbrough.  
1929-COWAP, CAPT. A. HAYTON, "Riniswell," Stockton-on-Tees.  
1928-DAVISON, E. L., 8, Egmont Road, Grove Hill, Middlesbrough.  
1928-DEVLIN, Miss M., 71, Queen Street, Coatham, Redcar.  
1919-DICKIE, W. A., B.Sc., "Ardenclutha," Marton-in-Cleveland.  
1919-DICKIE, Mrs., "Ardenclutha," Marton-in-Cleveland.  
1901-DoRMAN, Sir A. J., Bart., Grey towers, Nunthorpe.  
1926-DRUMMOND, D. G. F., "Woodside," Marton-in-Cleveland.  
1899-ELGEE, F., Dorman Museum, Middlesbrough.  
1913-EvANS, Miss, Hugh Bell School, Middlesbrough.  
1929-FABER, COL. H. G., Grey Close, Yarm.

1929-FABER, MRS., Grey Close, Yarm.  
1928-FENBY, E., 12, Regent Street, Stockton-on- Tees.  
1916-FLINTOPT, F. J., J.P., " Stoneleigh," Castleton, Yorks.  
1929-FORSTER, Miss JANE E., 22, Hambleton Rd., Linthorpe, Middlesbrough.  
1882-FRANKLAND, H., 1, Argyle Villa, Whitby.  
1912-GRAHAM, Miss H. M., Milton House School, Coatham, Redcar.  
1929-HALL, Miss DOROTHEA E. M., Capt. Cook's Memorial School, Marton- in-  
Cleveland.  
1928-HILL, O. C., 8, Sunnyside Avenue, Marton Grove, Middlesbrough.  
1929-HODGSON, W. E. D., M.B., B.S., 51, Clairville Rd., Grove Hill, M'bro.  
1926-HoLLOWAY, Rev. A. J. M.A., The Vicarage, Marton-in-Cleveland.  
1926-HoLLOWAY, Mrs., The Vicarage, Marton-in-Cleveland.  
1928-HoLLOWAY, Miss M., The Vicarage, Marton-in-Cleveland.  
1928-HoLLOWAY, PHILIP, The Vicarage, Marton-in-Cleveland.  
1928-HOLT, W. S., Cornfield Road, Linthorpe, Middlesbrough.  
1928-HoLT, Mrs., Cornfield Road, Linthorpe, Mrddlesbrough.  
1898-HoOD, Mrs. C., White Cottage, Great Ayton.  
1923-HoOD, CLEVELAND, "Kin-Shan," Nunthorpe.  
1922-HoOD, HAROLD, F.R.P.S., "Kin-Shan," Nunthorpe.  
1921-HoRNSBY, W., B.A., Milton Street, Saltburn-by-the-Sea.  
1907-HUDSON, W., The Crescent, Glaisdale, Yorks.  
1928-HUITSON, CHAS., The Gardens, Grey towers, Nunthorpe, Yorks.  
1902-INGLIS, A., 25, Hartington Road, Stockton-on- Tees.  
1926-INGRAM, J B.Sc., View Lane, Stanley, Co Durham.  
1902-JACKSON, E. W., F.I.C., F.e.s., F.G.S., "Godrevy," Saltburn-by-the-Sea.  
1902-KEDWARD, T. J. , ALDERMAN, 12, Grove Road, North Ormesby.  
1928-KENNEDY, Miss E. M., M.A., 5, Cleveland Street, Redcar.  
1926--KELSON, GBO., "Woodlands," Marton-in-Cleveland.  
1904 KERSHAW, A. L., "Woodside," Middleton St. George, Co. Durham.  
1902-KIRBY, Miss B. J., The Avenue, Linthorpe, Middlesbrough.  
1894-KIRKPATRICK, Miss, Claude Avenue, Linthorpe, Middlesbrough.  
1907-KITCHING, A. E., Ayton Firs, Great Ayton.  
1928-LILLIE, W Of Municipal Library, Middlesbrough.  
1899-LINTON, H., Cambridge Road, Linthorpe, Middlesbrough.  
1889--LOFTHOUSE, T. A., F.R.I.B.A., F.E.S., "The Croft," Cambridge Road,  
Linthorpe, Middlesbrough.  
1927-LOFTHOUSE, Miss, " The Croft," Cambridge Rd., Linthorpe, M'bro.  
1922-LUNAM, Mrs., York House, North Ormesby.  
1928-MASON, J. C., 40, Alexandra Road, Grangetown, Yorks.  
1916-MATTHIAS, Miss., Hugh Bell Central School (Girls), Middlesbrough.  
1927-McDoNALD, Miss E. M., 32, The Avenue, Linthorpe, Middlesbrough.  
1928-MILBURN, CHAS., Fletcher Street, Middlesbrough.  
1929-NEWBY, GEO., M.A., J.P., Littlefield, Norton, Stockton-on-Tees.  
1928-NEWMAN, Miss S., Hartburn Road, Stockton-on- Tees.  
1921-ODLING, M., M.A., B.sc., F.G.S., "Cherwell," The Grove, Marton-in- Cleveland.

1928-O'KANE, CHAS., 83, Valley Road, Grove Hill, Middlesbrough.  
1929-PARKE, Mrs. B. C., B.sC., 4, Cambridge Terrace, Norton-on- Tees.  
1929-PARKE, I. E., D.sC., 4, Cambridge Terrace, Norton-on- Tees.  
1929-PATTISON, J., "Romaldkirk," Park Avenue, Ormesby, Marton-in- Cleveland.  
1901-PEASE, J. H., Carlbury Hall, Piercebridge, Darlington.  
1926-POHLMANN, H. C., Yorkshire Penny Bank, Middlesbrough.  
1918-POSTGATE, CHAS., North Riding Infirmary, Middlesbrough. 1  
923-POSTGATE, Mrs., Albert Terrace, Middlesbrough.  
1927-POSTGATE, ARTHUR, 29, Colville Street, Middlesbrough.  
1928-POTTS, WM., 8, Dene Road, Grove Hill, Middlesbrough.  
1894-PUNCH, J. W. R., " Ellerstang," Castleton, Yorks.  
1899-PuNCH, Mrs., "Ellerstang," Castleton, Yorks.  
1909-READ, F., 'Parkside," Hartburn Lane, Stockton-on- Tees.  
1926-ROBERTSON, C. H., 21, Henry Street, Coatham, Redcar.  
1927-ROBERTS, W. G., 62, Leabourne Road, Thornaby-on-Tees.  
1902-RoBINSON, Dr. A. S., M.A., "Oulton," Redcar.  
1928-ROUTLEDGE, Mrs., "Bloomfield," The Grove, Marton-in-Clev.eland.  
1922-RoWLAND, Miss, 10, Harrow Road, Linthorpe, Middlesbrough.  
. 1922-SADLER, Ald. S. A., "The Knoll, " Coniscliffe Road, Darlington.  
1922-SADLER, Mrs., "The Knoll," Coniscliffe Road, Darlington.  
1906-SAUNDERS, T. W., 7, Yarborough Terrace, Bentley Rd., Doncaster.  
1909-SCHOLLES, ALF., F.I.C., F.C.S., Of Netherby," Junction Road, Norton.  
1928-StLLS, W. W.," Greenwood," Eastgate Rd., Linthorpe, Middlesbrough  
1928-SILLS, Mrs., " Greenwood," Eastgate Rd., Linthorpe, Middlesbtough.  
1929-SIMPSON, WM., East Lodge, Albert Park, Middlesbrough.  
1927-SMILBS, H. M., " Moelfre," Tollesby Rd., Linthorpe, Middlesbrough.  
1926-STEAD, F, A., F.C.S., M.I.A.E., Newton Hall, Great Ayton, Yorks.  
1927-STREET, A. A., 40, Alexandra Road, Grangetown.  
1923-STRINGER, Miss, North Riding Infirmary, Middlesbrough.  
1926- T ALLING, F., 37, Granville Road, Grangetown, Yorks.  
1929-TAYLOR, RAYMOND C., Atherslone, Marton-in-Clevdand.  
1927-THOMAS, G. B., "Beverie," The Grove, Marton-in-Cleveiland.  
1927- THOMAS, E. M., " Beverie, " The Grove, Marton-in-CJeveland.  
1895-THOIIIIPSON, M. L., F.E.S., 40, Gosford Street, Middlesbraugh.  
1904-TURTON, Major R. B.; Kildale Hall, Kildale, Yorks;  
1928-VOELCXER, JOHN F., Ivy Cottage, Norton-on-Tees.  
1919-VERO, Miss, 10, Grove Road, North Ormesby.  
1926-WADE, Major W., O.B.E., Service Studios, Wilson St., Middlesbrough.  
1928-WALXER, Dr. HAROLD, " Ashleigh," Southfield Rd., Middlesbrough.  
1928-WALKBR, Miss EVA, " Ashleigh," Southfield Road, Middlesbrough.  
1926-WHITILEY, J. H., F.I.C., Castleside, Consett, Co. Durham.  
1927-WHITI'IELD, R. C. V., Ravenswood, Staines, Middlesex.  
1925-WILSON, H. N., A.I.C., Bedford Road, Nunthorpe.  
1925-WILSON, Mrs., Bedford Road, Nunthorpe.  
1902-WILSON, J. R., 6, Dovecot Street, Stockton-on-Tees.

1927-WOODWARD, SYDNEY, 159, Marton Road, Middlesbrough.

### **Associate Members**

BRUNTON, Miss KATHLEEN, Rudd's Arms, Marton-in-Cleveland.

GIBSON, WM., 13, Windsor Road, Linthorpe, Middlesbrough.

HARRISON," H. C., 38, Devonshire Road, Linthorpe, Middlesbrough.

LORD, JOHN, 6, West View, Grove Hill, Middlesbrough.

O'HARA-PROUD, F. R.,9, Claude Avenue, Linthorpe, Middlesbrough.

PRINGLE, G. E., 20, Poplars Road, Linthorpe, Middlesbrough.

THOMAS, H. E., " Aysgar!h," Belle-Vue Grove, Middlesbrough.

1.The Club shall be called the" Cleveland Naturalists' Field Club.

2.Its objects shall be to' encourage a taste for all branches of Natural Science and Architecture and to facilitate their study(1) By reading of papers and lectures; (2) by general field work and excursions to places of interest; (3) by the record of Natural History facts in the district; and (5) by the maintenance of a library.

3. All candidates for Membership shall be proposed and seconded by existing Members,in writing,on a form approved by the Committee, Such proposed form shall be sent to the Secretary, and the election of the person proposed shall be submitted by him to the decision of a majority of the Committee at their next meeting.

4. The Officers of the Club shall be: a President, Presidents of Sections, who together with the Past-Presidents shall be Vice-Presidents; a Secretary or Secretaries, and a Treasurer; who together with six other Members shall form the Managing Committee, and shall be elected annually. The outgoing President shall be eligible for reelection. Three shall form a quorum.

5. The Annual Subscription shall be not less than five shillings and shall be due on January 1st each ye.ar. The Committee shall have the power to admit persons under the age of 21 years as Associate Members at a subscription of 216 per annum. Associate Members will not be entitled to the Proceedings, nor to individual notices except by special arrangement; such arrangements to be decided by the Committee. The Committee shall have power to remove from the list of Members of the Club any Member or Associate whose subscription is in arrear.

6. The Annual Meeting shall be held in March,at which the Officers of the Club shall be elected, and the annual report, reports of sections, balance sheet, etc., shall be presented, and places for Field Meetings be selected.

7. A Syllabus of General Meetings shall be sent to all Members and, Associates by the Secretary at the commencement of each session, together with a printed postcard on which Members may signify their desire for full particulars of individual meetings.

8. The Club shall be affiliated to other Natural History Societies at the discretion of the Committee.

9. The Committee shall be responsible for the publication of Proceedings and Reports, and may nominate persons for election as honorary Members of the Club for special services to Natural History or Archaeology, or to the Club.

10. No alteration in these rules shall be made except at the Annual Meeting, or at a special General Meeting called for that purpose; the Committee shall have power to call a special general meeting at any time.

## **46<sup>th</sup> Annual Report**

The Session 1926-27 has been carried out under considerable difficulties. Owing to the industrial disturbance, several meetings had to be abandoned or reorganised at short notice; the difficulties of transit and the bad weather also kept many away, so that the attendance at the outings was very small.

Towards the end of August all members. were circularised in regard to suggested lectures, and judging from the replies received from about a third of the members, which would indicate an average attendance of twenty two, your Secretary felt justified in carrying out the proposed programme.

Your Committee feel strongly that more support should be given to these lectures, and would welcome any suggestions as to time and days for these. With small attendances, lecturers can only be drawn from amongst your own members, as lecturers cannot be invited from a distance to address only a handful of members as audience.

During the year, twelve new members have been elected, but several have resigned, including your Joint-Secretary, Mr. G. Knight, who has carried on during a very difficult and trying time. The Club has also lost by death, one of its oldest members in Mr. Thos. Brown, and the present membership stands at' seventy-eight.

Your Secretary feels strongly that a. report and proceedings, even if short, should be published annually; this, however, cannot be done unless the membership is considerably increased; organised canvassing on the part of members should achieve this.

Your Committee has met on five occasions, and ventures to bring before you a draft of new rules which are calculated to make the working of your Club more efficient.

During the year the concluding part of the third volume of proceedings has been issued.

In conclusion your Secretary would like to express his indebtedness to your President, Mr. E. W. Jackson, for much helpful advice and assistance. The thanks of the Club are also due to the North Eastern Daily Gazette for several references to the Club's activities.

## **47<sup>th</sup> Annual report**

The Session 1927-28 has in many ways been remarkable. The first three meetings were conducted by the three Senior Members, viz.: J. J. Burton, Sir Hugh Bell and H: Frankland.

The custom of holding a week end meeting at Whitsuntide has been revived with great success, and in addition eight Saturday meetings, four evening meetings and one early morning meeting to view the Eclipse which was itself eclipsed, was held

Owing largely to the generosity of your President, important excavations have been carried out on Eston Nab.

The Club has, after several years lapse, been again placed on the list of those entitled to send a Delegate to the Congress of Natural History Societies (one condition of which is publication) at the British Association, and your Secretary was nominated as your Delegate.

Six Winter Meetings, in addition to this evening's meeting have been held, and well attended.

During the year New Rules have been issued, which provide for the admission of Juniors as Associates.

Your Secretary regrets that he has again to record a loss to the Club by death. Mr. J. M. Meek was the 4th Senior member of the Field Club, and the Minute Books shew that he was an active member up to at least 1912, and a VicePresident for 29 years.

Losses.

By Death	1
By resignations	5

By removal under Rule 5. 4

Additions.

Members Elected 29

Associates Elected 7

Our membership therefore now stands at 100 plus 7 Associates and shows an increase of 19.

Although the addition to our Membership is considerably less than could be desired, it is a healthy sign that members elected during the last 18 months have been taking an active interest in the Club by attending Meetings, entering into discussions, reading papers and nominating new members.

The thanks of the Club are due to the Editors of the North Eastern Daily Gazette, the Northern Echo and the Yorkshire Post for many references to the Club's activities and

to all those members and non-members who have conducted expeditions or given papers.

Your Committee recommend that the publication of Proceedings shall be immediately proceeded with, and, subject to your approval this will be done.

Your Committee considers that Proceedings should consist for the most part, of original papers rather than of a synopsis of the year's work.

Mr. J. J. Burton, our Senior Member, and your Secretary consider that the proceedings should take the form of a report with the synopsis of the Expeditions and lectures held during the year, with original papers. This would be, it is thought, of greater interest to those of our members who are unable to take an active part at lectures or on Excursions. A perusal of the earlier proceedings will shew that this was originally done, and the same is the general practice of other Societies.

Your Committee desire to point out that a considerable number of back parts of Proceedings are on hand and suggest that members should obtain them so as to complete their volumes; it is suggested that the original prices should be reduced by half except in the case of scarce numbers.

Your Committee have appointed Mr. M. L. Thompson as your Delegate to the Northern Naturalists' Union.

Report of Delegate to B. A. Conference of Delegates of Natural History Societies at Leeds.

The President, Sir FRANCIS OGILVIE, gave an address which consisted of a plea for intensive survey of even one field only.

A Proposal by Hertfordshire N .H.S. included a recommendation that a descriptive list of rare plants and the localities in which rare plants occur, should be circulated.

Your Delegate strongly opposed this motion. He felt that issuing a description of rare plants with their localities, was inviting the destruction of these plants. Many rare plants such as the Ladies' Slipper near High Force and the white variety of the Bee Orchis near Oxford, and the Pasque Flower on the Berkshire Downs, still existed owing to the fact that their exact habitat is a closely guarded secret.

That part of the motion was rejected

Particulars of the Conference will be found in the Report of the British Association or the individual Report on the Congress which will be deposited at the Dorman Museum, where the Field Club's Library is housed.

## ABSTRACT OF REPORTS OF FIELD MEETINGS AND LECTURES.

The Syllabus arranged for 1926 was considerably modified owing to the General Strike; details of expeditions were not kept.

MAY 8th.

Mount Grace Priory, cancelled.

MAY 24th.

Goldsborough.

JUNE 6th.

Ayton via Captain Cook's Monument to Kildale.

JUNE 19th.

Richmond to Easby.

At Richmond Parish Church, the Choir Stalls, formerly in Easby Abbey, were seen; unfortunately they are not now in their original order and the Latin inscription they bear is thus now unreadable.

From the Church the party went on to Easby and saw the ruins of the Abbey. They were in a disgraceful state; most of the good work done by the Yorkshire Archaeological Society, in clearing away ivy, etc., is now indiscernable, and an electric cable on ugly poles is carried through the chancel from the old mill, now a Generator House.

The Church of Easby was visited and also Richmond Castle.

The almost impregnable situation of the latter was well realised from the roof.

July 3rd.-Lealholm to Castleton -Cancelled and replaced by a very successful visit to Mr. Odling's Garden.

July 21st.- Teesmouth.

July 24th.-Guisborough to Saltburn.

August 18th.-Falling Foss in conjunction with the. Whitby Field Club. A successful meeting in spite of the rain which fell at the start; those who did venture were well rewarded; the extraordinary dark colour of the Bramble flowers was noticed it was suggested that this might be due to the Alum Shales, Alum being known to increase the colour of Hydrangeas.

September 11th.-Rievaulx Abbey. A few members went by car and were shewn over by Mr. Peter Hood.

September 18th.-Billingham and Norton Churches.

WINTER MEETINGS, 1926-27.

Leaves from an old Stockton Scrap Book G. Bowes, B.Sc.

November 19th, 1926.

An informal talk, illustrated by numerous old posters, etc. The development of Stockton from " a mean insignificant place with habitations of mud and thatch" in 1650 was traced to about 1825. Stockton began to assume importance soon after a Toll Bridge across the Tees was built in 1767. A further important step, which really made possible the Shipping industries of Stockton, was the first Tees cut, projected in 1769, and finally made in 1810.

About this time Stockton was considered as a rival to Liverpool as a port, being the shipping port for Westmoreland, South Durham and Cleveland. During the Napoleonic war all means of conveyance were registered and corn and flour appear to have been rationed. There appears also to have been an equivalent of Race Week, a profit of £300 being recorded from three days' cock-fighting. After this, long discussions as to making a canal from Stockton to the Coal-field led to the first public Railway in 1825.

December 17th, 1927.

Exhibition of Lantern Slides by Messrs. Knight, Pearson, J. J. Burton, Odling and Major Wade. These covered almost all branches of natural history and archaeology, besides some fine examples of the work of the camera during the war.

An interesting, but somewhat one-sided discussion on the aims and methods of the photographer followed.

### **THE NORTH WEST HIGHLANDS.**

Prof. Albert Gilligan, D.Sc., F.G.S.

January 21st, 1927.

Joint meeting with the Geographical Association.

Prof. Gilligan gave a most lucid explanation of the structure and tectonics of the " North-West Highlands," illustrated by lantern slides.

The lecturer shewed how the solid " Architecture " of the district was the result of most intense folding, with subsequent faulting and the formation of thrust planes on an enormous scale, even more dislocation having taken place than in the (much more recent) Alps. The final stages in the sculpturing of the country, were however, the result of normal subaerial denudation.

### **NATURAL HISTORY & MYTHOLOGY.**

M. Odling, M.A., B.Sc, F.G.S.

February 18th, 1927.

The lecturer pointed out that "Myth" need not mean purely a fictitious narrative, but regretted that most myths had been handed down by poets, who had used their poetic license to such an extent that the disentanglement of fact from fancy was often most difficult, though he supplied possible explanations of several typical myths and pointed out how near the truth some of the early poets were in their observations.

March 4th, 1927.

MEETING AT THE MUSEUM.

Mr. Elgee explained the method on which the Museum was arranged, and shewed the members round. He pointed out that he was cramped by lack of space and lack of funds, although members thought that owing to the general orderliness and careful labelling of the specimens, this would be by no means apparent to the uninstructed eye. Members also saw several specimens not yet "on view", notably the very interesting dug-out canoe lately dredged from the Tees.

ECLIPSES.

J. W. R. Punch.

March 25th, 1927.

Mr. Punch gave a very lucid address to a large number of members and friends on the subject of Solar Eclipses

. By means of very ingenious lantern slides the relative movements of sun, moon and earth were shewn, and "Eclipses" were produced at will. Photographs of partial eclipses, some taken by Dr. Drake Brockman, were also shewn, as well as other astronomical photographs.

Mr. Punch indicated what phenomena might be expected at the total eclipse, and explained how much the study of eclipses had contributed to our knowledge of sun spots, which seem to be connected with magnetic storms on earth.

After this lecture, Mr. Odling gave an account of his meteorological observations over the last two years, and the meeting concluded by Mr. M. L. Thompson exhibiting a number of specimens and illustrations of entomological interest.

The Lecture was followed by the Annual Meeting.

SUMMER SESSION-1927.

May 14th. 1927.

MOUNT GRACE PRIORY.

Sir Hugh Bell, our second senior member, conducted a number of members over Mount Grace Priory. His lucid description made it possible to visualize the lives and environment of the Carthusians, whose home it was. These are the most important remains of a Carthusian house in England, and in spite of the pouring rain Sir Hugh himself acted as guide and from his great knowledge explained most clearly the mode

of life of the former inhabitants. Sir Hugh also gave us the privilege of seeing the inside of the house, adding a detailed account of its transformation from the ancient Guest House, consisting of two large Halls, under its various owners to its present state.

He then entertained the members present to tea. The party left after a most pleasant and instructive afternoon, wishing that all owners of historic houses had exercised the same nice discrimination in their care of ancient edifices as had our host and his father before him.

May 21st, 1927.

KETTLENESS AND HINDERWELL.

Joint meeting with the Whitby Naturalists' Field Club.

The party soon split up into two parts, one visiting the shore and coast sections, from a geological point of view, and the other larger group visiting the Roman Station at Goldsborough. The Geologists chief interest was in a remarkable beach conglomerate now of cement-like hardness, of very recent date "Post Alum Work" period, in fact. An example of a feature rather characteristic of the Yorkshire Lias coast was noticed, viz;.: a stream falling into the sea over a small headland instead of , as is more usual, in a small bay; whilst the rest heard some new views on the organisation of the Roman Fort. Both parties afterwards walked by fields and woods to Sandsend, noting many flowers, but no rare species.

June 9th, 1927.

Evening Meeting at Mr. J. J. Burton's garden, which was a blue of colour with the Alpines.

Mr. Burton shewed the members round, and amazed them by his memory for names. His chief treasures were some hybrid primulas raised by himself, including two specimens of a double blue primula-the only two in existence.

June 4th-6th, 1927.

WHIT - WEEK END AT COXWOLD.

Under the guidance of Mr. Odling.

Most of the Party arrived for lunch on Saturday, and 15 members and friends visited Byland Abbey under the guidance of Mr. Peter Hood, who not only explained the buildings, but also the habits of the Cistercian Monks. The work of the Office of Works has here been even more striking than in other places, the mediaeval tiled floor being exceptionally fine. Six members stayed the whole time, and during the evenings many interesting discusslons ranging from Geology to dyes for printers' inks, took place.

SUNDAY.-Fox Folly through Oldstead and up the White Horse Hill returning at the foot of Roulston Scar. Glacial boulders, a wonderful system of overflow channels and much of interest in Corallian-Calloviaian series delighted the Geologists. :Botanists were rewarded by numerous less common plants: including the Dusky Cranes-bill (*Geranium phaeum*) and a pure white form of *Myosotis*.

On Monday, two quarries were visited near Oldstead showing Moor-grit and the Grey Limestone (Scarborough Limestone), and the woods up to Wass Observatory were carefully examined, Blue Bells (*Scilla nutans*) being predominant.

At the top of Wass Moor the Chickweed Winter-green (*Trientalis europaea*) was found in profusion, and nearer to Cold Cam *Orchis mascula* was still in bloom. On the return journey quantities of Lousewort, Meadow Saxifrage and Water Avens were found.

The Church was visited, when Mr. Postgate gave a detailed account of the Heraldic Crests and Coats of Arms.

,A full account of this most interesting district will be found in "The Naturalist to for 1919, pages 206-210.

June 9th, 1927.

Mr. T. A. Lofthouse's Garden at Linthorpe was visited, where the Club saw a great variety of plants, many collected by Mr. Lofthouse; each has its own situation adjusted as well as possible to its requirements. The most striking display was, perhaps, provided by the Gentians, Meconopsis and Primulas.

June 15th, 1927.

EVENING MEETING TO WILTON.

Eight members climbed the hill from Eston and saw the exposure of the ironstone, whence, proceeding to Wilton, they carefully noted the flora. Goosefoot (*Chenopodium bonus-henricus*) and the Stag's Horn Moss (*Lycopodium clavatum*) were amongst the less usual species noted, and Snake Weed (*Polygonum bistorta*). The Norman doorway of Wilton Church was also examined.

June 18th, 1927.

Great Ayton with the Northern Naturalists' Union

A very successful meeting; the party split into two, the Geologists visiting Roseberry Topping, where the plant bed was discovered in situ and yielded some fine specimens.

For details of the Geology see Proceedings, Cleveland Naturalists' Field Club, Vol. 3-Part 4, Pages 190-205.

The Botanists went through the woods on to Easby, and thence to Gribdale Gate; Crowberry (*Empetrum nigrum*) is abundant on Easby, Chickweed Winter-green (*Trientalis europaea*) was also found. The most striking feature was, undoubtedly, the blaze of yellow, red and brown of the mosses

. The rapid development of moor land vegetation where trees had been felled was remarkable.

Near Gribdale Gate the two cotton sedges *Eriophorum polystachyum* and *E. vaginatum* were abundant. Exceptionally fine spikes of Gorse were seen on the Ayton Banks Mine Tips, it would be interesting to note if this development is due to the season or the soil.

June 25th, 1927.

MARTON IN CLEVELAND.

The party met at the school, the Foundation Stone of which was laid on November 29th, 1849, and opened on August 22nd, 1851, as a Memorial to Captain James Cook who was ham a few yards away. The following have been presented to the school :-

Union Jack-(Yorkshiremen's Society-Sydney). Commonwealth Flag-(Children of Botany Bay School). Canadian Flag-(Children of Wetland School). New Zealand Flag-(People of Gisborne). Hawaiian Flag-(Lieut. Col. Palaver). Two Portraits of Captain Cook.

Scene of his Death.

Copy of Baptismal Register. Photo of National Memorial.

The Memorial Stone which was originally in the Church is now in the School.

The Church was next visited and a full account of its architecture will be found in Vol. I of our proceedings.

The Parish Registers go back to January 21st, 1678 and contain the record of Capt. Cook's baptism, as follows :-

No'br. 3, James Ye son of James Cook, day labourer baptized"

There is also the following register :-

A Register Book for the Parish of Marton for burying in Woolen, March Ye 6th, 1678.

The Party then proceeded to Mr. Odling's house where Refreshments were provided.

An original Smee Battery was seen at work copper plating a leaf, and the original cucumber shewn to Queen Victoria in April, 1841, with the hole made by Her Majesty's finger, was examined. Also a case of Caddis worm cases, both natural from a stream and made of various materials such as tortoiseshell, coral, glass, etc. It was found that they could not make cases with rounded material such as beads nor strangely enough with coal, slate or brick. These cases date from 1863.

June 29th, 1927.

. An early morning excursion to Marton to see the eclipse. Although the sudden darkness of totality was very impressive, the excursion must be set down as a failure, as owing to the clouds the sun was not even seen.

An illuminated address was presented to Mr. W. G. Appleyard in recognition of his being made an M.B.E.

June 29th, 1927.

An evening Meeting at Coatham Marsh was very badly attended. Many rare marsh plants-which are becoming rarer as the marsh is being built over, were noted by those members who, under Mr. Lofthouse's leadership, attended the excursion.

July 9th, 1927.

LEALHOLM TO GLAISDALE.

A very enjoyable meeting under Mr. W. Hudson's leadership was held at Lealholm with the Whitby Club. Permission having been granted by Lady Ley, the Rock Gardens in Crunkley Gyll were seen, where "Alpines" grow in practically wild condition. The party then walked back by the River bank to Glaisdale, where Mr. Hudson entertained them to tea. A few members also visited Arncliffe woods.

August 17th, 1927.

BATTERSBY TO CASTLETON.

Led by Mr. Punch over Battersby Moor to Baysdale Abbey and thence over Great Hograh Moor to the Westerdale Rd. and so to " Ellerstang," where Mrs. Punch. extended very welcome hospitality to the hot and thirsty party, Various rare plants were found, including a white cross leaved heath, The second record for Cleveland of the Solitary Ant was also made. In one of the farm houses one of the few remaining ovens in which the fuel-wood is burnt in the oven itself before, inserting the dough was seen. This oven is to be retained, by desire of the tenants, when the house is modernised.

Near Castleton an old Slag Heap of a pre-reformation "bloomery" was seen. Subjoined are analyses of two specimens. Although these must not be taken as "average analyses", (at least 1 cwt. would be required for a fair sample) they give a fair idea.

The analyses were made by the two Secretaries and one of them" B " is published by kind permission of Mr. J. J. Burton,

It would appear that only from 10-15% of the Iron present in the ore was extracted,

	Silica	Alumina	Ferric Oxide	Ferrous Oxide	Lime	Magnesia	Mang Oxide	Sulph	Phos Pent Oxide	Carbonaceous Matter
A	29.97	24.58	3.58	30.84	5.77	.50	1.52	.14	.25	2.32
B	29.27	14.01	7.43	28.67	9.31	6.81	2.23	.14	1.93	

August 27th, 1927.

FALLING FOSS was visited by a party made up of our members and Whitby members. The route taken was from Sleights by Iburndale and Littlebeck and back by

Ugglebarnby Moor. On the fine day after the recent rains, the valley was delightful, and a fair volume of water was coming over the Foss. Both in the valley and on the return over the (very wet) moors several rarer plants were noted.

September 24th, 1927.

Expedition to Eston Nab to view the results of the excavations. Owing to the heavy rain in the earlier part of the day only the President and Mrs, Sadler, and Mr. Odling took the risk of the soaking and met Mr, Elgee at the Camp. They were fully rewarded by the lucid explanations of Mr. Elgee. An account of these excavations will be found on pages 33 to 35.

WINTER SESSION 1927-28.

October 28th, 1927.

FROM THE DOGGER TO THE DOWSING.-E. H. WAKEFIELD.

In a long lecture fully illustrated by lantern slides. the lecturer kept the interest of his audience from beginning to end.

All phases of the North Sea fishing industry were given the process of catching, gutting, cleaning, sorting and packing were illustrated and mention made of the availability or otherwise of fish for food.

Many fish owing to their poisonous barbs have to be thrown overboard. It was pointed out that when fresh, the Mackerel was the king of fish, but if stale was highly dangerous, hence the fact that Mackerel is the only fish allowed to be cried in the streets on Sunday.

The principle of the trawl, for bottom fish and other nets for surface fish was clearly demonstrated.

The discovery of the North Sea Fishing Ground was due to a vessel being blown out of its course and dropped its nets on the off chance of a haul.

Hull was the original Port, but, owing to a strike the Headquarters became changed to Grimsby. Hull is still the premier Port for the more Northerly waters.

Illustrations were given of the old Sailing vessels up to the latest Motor Vessel and the audience were taken on a trip on a steam trawler, the sea life of the fisherman being then clearly realized.

November 25th, 1927.

COAL AND COAL PRODUCTS-H. N. WILSON.

The Lecturer first of all dealt with the geology of the coal measures' and the conditions necessary for coal formation from plant remains. Then the early days of coal carbonisation were outlined, a patent of the time of Charles II being quoted. The

rise of gas and of the " patent Coke Oven" industry in this district were described; the lecture concluding with a brief account of the manufacture from coal tar of explosives and dyes, the replacement of natural dyes by the latter being outlined.

The Meeting concluded with a brisk discussion on " Low Temperature Carbonisation."  
"

January 6th, 1928.

This Meeting took the form of a Soiree at which the President and Mrs. Sadler kindly provided refreshments.

A varied evening, when discourses on Salmon and other fresh water fish, Goldsborough Camp, unusual minerals from slag tips, meteorology and natural history activities in general were heard. Mr. Kelson gave us the benefit of his great practical knowledge of fresh water fishing, by a detailed account of the habits of the salmon and explained his reasons for believing that Salmon did not feed in fresh water and only took the fly not as food but out of curiosity. Just as the tadpole feeds by absorbing its tail when changing to a frog so the salmon feeds on its fat when in fresh water.

He shewed conclusively that Fishing was not the lazy recreation so commonly considered, and that the quietness required enabled many natural history observations on birds and animals to be made. Mr. Punch was most interesting in his description of Goldsborough and an account of Mr. Odling's work " Geological Observations on Slag Tips" appears elsewhere.

All these short papers were illustrated by slides and in addition many slides from photos taken on the Club's excursions were shewn.

January 28th, 1928

" THE GEOGRAPHY AND GEOLOGY OF ARCHITECTURE " by C. E. N.

BROMEHEAD, B.A., F.G.S. of the Geological Survey.

A JOINT MEETING WITH THE GEOGRAPHICAL ASSOCIATION.

The Lecturer shewed how some primitive wood and mud structures had certain peculiarities reproduced later in stone, as in the case of Corinthian Stone Columns. He went on to describe by many examples how the sort of stone available influenced style-"Gothic is an architecture of oolitic limestone." In the case of Churches, money was often of no importance, and stone was often imported; churches could not be taken as representative of a district, for instance the principal churches in York are of stone, but York is essentially a town of brick. Thus, as in our own domestic architecture, style is largely dependent on the material to hand, i.e., on the geology of the district. With concrete the lecturer seemed but little in sympathy, although it also seems to be developing a style of its own-but very different from the Roman use of this material.

February 10th, 1928.

At a meeting to which the Geographical Association was invited, Mr. J. W. R. Punch gave a lecture on " The Dolomites and Western Alps. "

It is really impossible to summarise this Lecture, as from the firm foundation supplied by geology the lecturer gave a summarised description of the scenery of the regions which his title covered, and a short account of why these districts had different types of scenery, starting with a beautifully clear explanation of the great "Earth upheavals of Tertiary Times"during which the Alps came into being.

Illustrated by numerous most excellent lantern slides-one of which, as an -illustration of over thrusting, the writer has never seen equalled, and many of which were very beautiful-and delivered in charming manner, this lecture was amongst the best to which the Club has ever had the pleasure of listening.

February 24th, 1928.

Dr. Drake Brockman gave a very full account of" Fountains Abbey" illustrated by about 300 slides. Dr. Drake Brockman's fund of information shewed that he has hunted up the records very thoroughly and it seemed as if he knew every stone in the fabric. He described the Abbey and its monks from its foundation to the dissolution.

March 23rd, 1928.

Mr. Elgee gave a very full account of his work on Eston Nab of which an account occurs on page 33.

### **ARCHAEOLOGICAL EXCAVATIONS FOR 1927.**

Drawn up by the Joint Secretaries from information submitted by Mr. F. Elgee.

At the suggestion of, and as the result of a fund initiated by Mr. S. A. Sadler numerous excavations were carried out both at Whorlton and at Eston Nab under the direction of Mr. F, Elgee with the following results :-

Excavations were undertaken here owing to the fact that some years ago examples of 2nd or 3rd century Roman ware had been unearthed in the churchyard. In 1923 Messrs. W. Hornsby and J. D. Laverick sank a trench to a depth of five feet in the field east of the church at the bottom of which they found a cobble stone pavement, probably an ancient road; no Roman remains were however found but mediaeval potsherds were numerous on the surface of the field and in the trench.

In all, eleven excavations were made as follows :\_

- (1) By the field hedge, west of that portion of the churchyard where the Roman pottery had been unearthed; two or three small pieces of Roman pottery were found.
- (2) Ditto. but nearer the road; nothing was found.

(3) In a square enclosure formed by rectangular earthworks beyond a dried up fish pond bounding the same field on the west; one or two fragments of mediaeval ware were found.

(4) South of the churchyard, close to the field gate; one small piece of dark Roman ware and some mediaeval pottery found.

(5) Ditto. But further west, within an earthwork crossing the field from north to south numerous mediaeval potsherds were found.

(6) Ditto. west of the earthwork ;only poor mediaeval . potsherds were found.

(7) North of the churchyard, beyond the road, northern end of the field on the brink of the hill; one piece of rusty end iron and a few mediaeval potsherds were found

(8) Ditto centre of the field; mediaeval potsherds were more numerous

(9) Ditto close to the road-side hedge, only cobblestones over a field drain.

Id east of the last and within the earth-

(10) In a Pasture field east of the last and within the eqrthworks traces of foundations were found and in a trench across the interior area of a rectangular foundation, the rim of a Roman vessel was found.

(11) Within a square earthwork north west of the church, a few mediaeval potsherds were found.

## CONCLUSIONS.

Whatever the Roman site Whorlton may have been, 1t is probable that the site is now covered by the church and it would appear that in the construction of this and of the castle the ground has been sufficiently disturbed to obliterate all traces of a camp or other settlement. The earthworks themselves are clearly mediaeval, and the numerous potsherds in the fields to the north of the church come from the village of Whorlton, which formerly stood on this site.

Under these circumstances it was felt desirable not to continue operations further but to transfer activities to Eston Nab.

## ESTON NAB

As further excavations are to be made, it is undesirable that more than a brief outline of what has been done and of the discoveries made should be given at present.

The camp, which is situated at the very summit of Eston Nab, at a height of 800 feet consists of a roughly semi-circular rampart surrounded by an outer fosse and encloses a space of roughly 230 yards parallel to the cliff edge by 110 yards, at right angles to this. Part of the camp has disappeared as the result of quarrying operations and some of the structural details have been obliterated in the building of the watch tower during the Napoleonic War.

The work that has been carried out may be summarised as follows :-

A trench, about 100 yards long, was cut through the fosse and rampart along the shorter diameter of the camp; this reached the base of the fosse at about a depth of five feet where an earth layer containing charcoal and decayed vegetable matter was met with. This represents the soil and turf that accumulated directly after the fosse was dug. Owing to the excessive wet it was not possible to get to the bottom of the rampart, though it is clear that this is at least eight feet in vertical thickness. Small flint chips, also a fragment of chalk and charcoal were found in the trench.

A trench in the outer rampart showed gravelly earth overlying clay resting on the underlying solid sandstone, and within the camp a number of poor flints were found, often just below the surface. It was here that one implement, considered by experts to be of pre-Palaeolithic age, was discovered. As much has been made of this flint in the papers it should be pointed out that others do not attach the same significance to it as Mr. Elgee. Even if it be granted that the specimen is as old as the experts suggest, its presence may be explained by its being what is known as a *Derived Fossil* and that it was brought there along with the other flints by the builders of the rampart, as a likely piece of flint from which to make instruments. \* Calcined human bones were also found at a depth of about one foot, a few yards inside the rampart.

A second trench, at right angles to the first, about 76 yards in length yielded a number of irregular chips and flakes together with traces of charcoal.

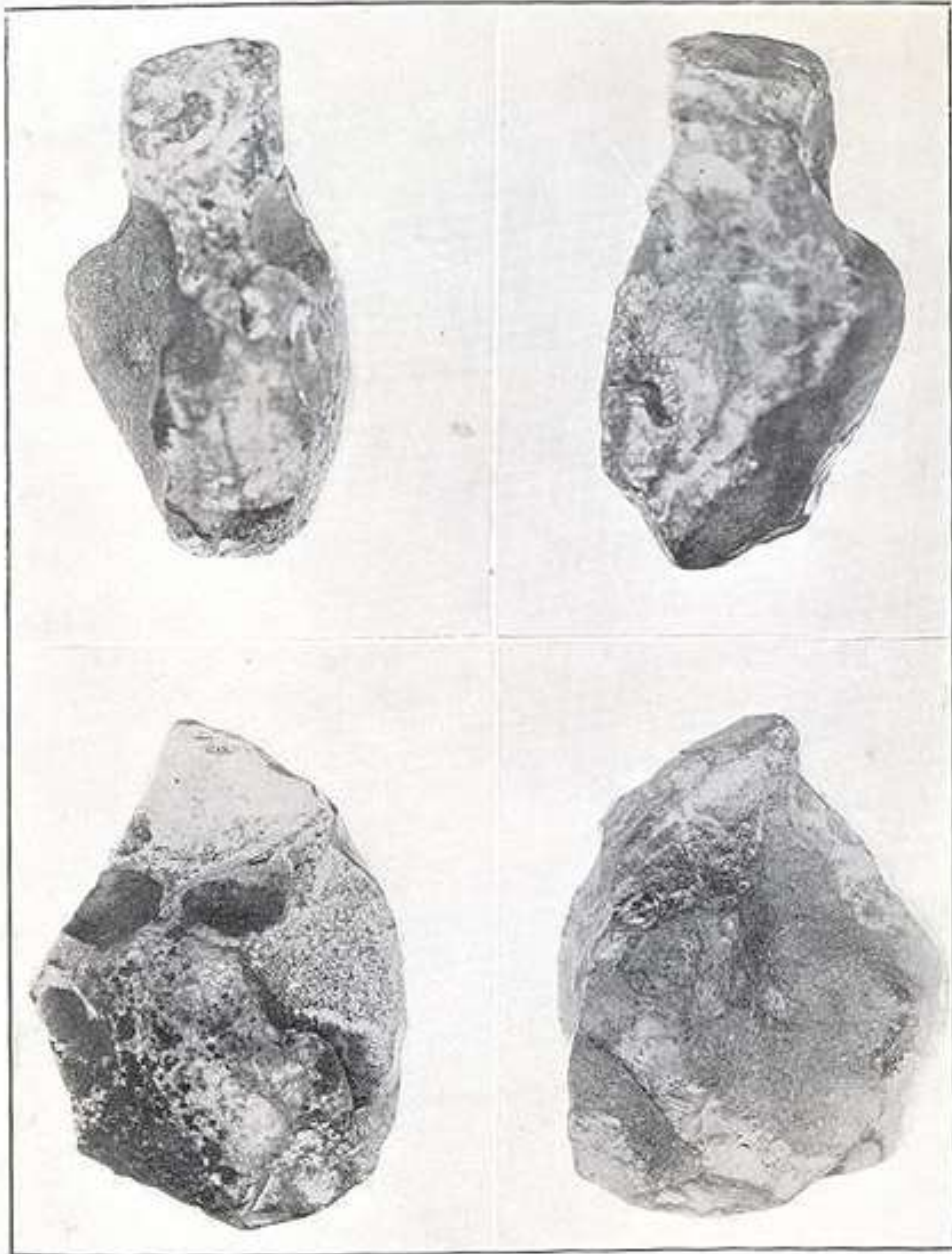
Four more or less circular depressions within the camp were excavated on the off chance of their proving to be hut sites; these yielded a number of large blocks of sandstone of many shapes and sizes which turned out to form part of a wide platform along the inner edge of the rampart and are also visible in the cliff edge. In these hollows, fragments of animal bones and flints both burnt and unburnt were found.

Fragments of cremated human bones have been found in the section at the cliff edge and at least six cremated interments have been noted, and associated with them, remains of a food vessel, jet, burnt and unburnt flints and a fine example of a leaf shaped arrow-head; unfortunately this burial site had been much disturbed in fixing fence posts. The evidence so far obtained all points to early Middle Bronze Age, but until further excavations have been carried out, it would be unwise to formulate any theory as to its purpose, i.e., village, military outpost, or place of refuge in time of war, though Mr. Elgee considers the last the most probable.

The thanks of the Field Club are due to E. B. Emerson, Esq., of Tollesby Hall, and to his tenant for permission to excavate at Whorlton; and to Col. M. J. Stapylton, the Trustees of Lady Hewley's Estate, and the Eston Urban District Council for

\*Thanks to Mr. Elgee, we are enabled to illustrate this flint.

PLATE I.



*Photo—M.O.*

permission to excavate at Eston ; also to the Rev. A. P. Barker and Professor P.M. Roxby for much valuable help in various ways; and to Mr. F. Elgee for having supervised the excavations.

The thanks of the Club are also especially due to Mr. C. W. Cockersoll, Surveyor to the Eston Urban District Council, for not only furnishing the necessary tools but for preparing a plan of the site and help in many ways, also to those whose subscriptions allowed of these excavations being undertaken and who by promises of further subscriptions are making further excavations possible.

### **METEOROLOGICAL OBSERVATIONS at Marton-in-Cleveland. 1925-26-27.**

Popular ideas in regard to rainfall, temperature, etc., are often so far from the truth that a few preliminary remarks would appear desirable. A copious deposit of Hoarfrost is often taken to infer a very heavy frost, but in reality it is no criterion of the severity of the frost but of the amount of moisture in the atmosphere. It is true, that from a horticultural point of view, white frosts are most to be feared.

Where thermometers are kept, these are too often in unsuitable positions, such as the side of a house instead of being in the open, so as to receive a full current of air; though at the same time they must be suitably screened so as not to allow the direct rays of the sun to play on them.

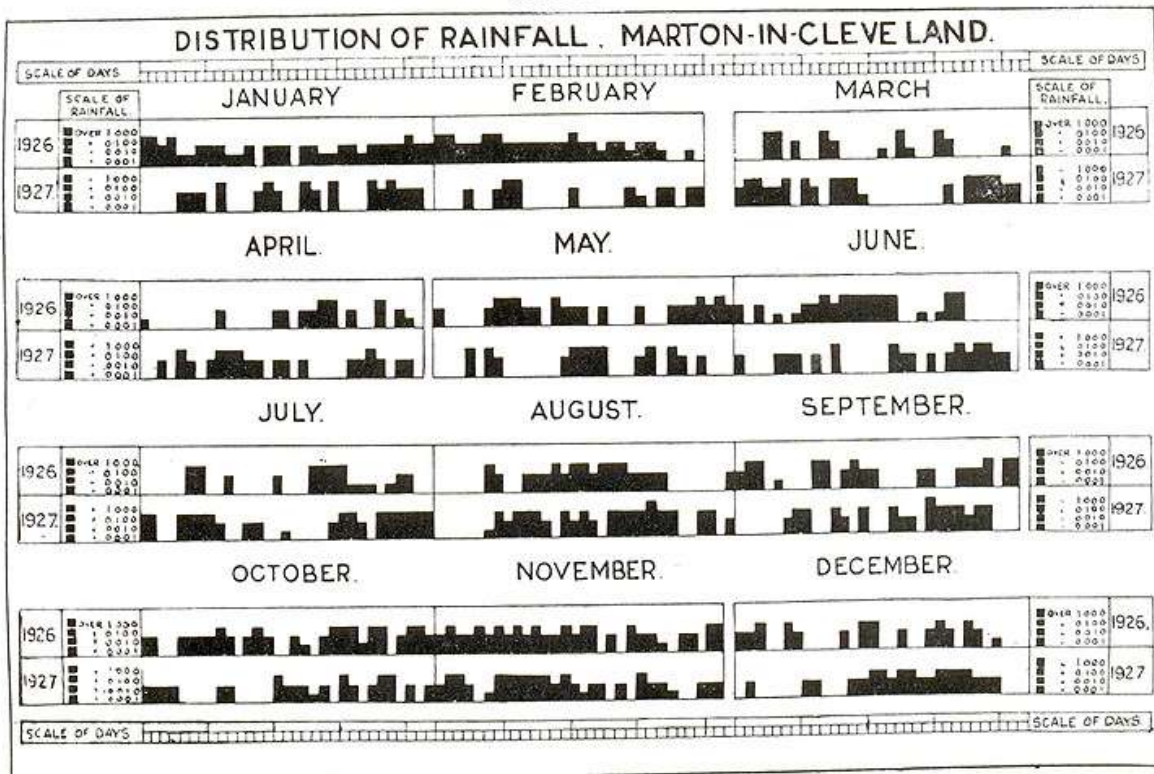
Rain or drizzle for most of a day is usually considered to mean a heavy rainfall, whereas a fairly heavy shower on an otherwise dry day is ignored; yet the actual rainfall from one such shower is often far greater.

Not only is rainfall very difficult to estimate, but accurate records are by no means easy to obtain. In most ordinary gardens, and for that matter in most public parks, the official conditions are difficult to meet. For instance-A rain gauge must be situated in such a position that nothing subtends an angle therewith of more than 10 degrees from the horizontal at the level of the top of the rain gauge.

To convey some idea of what this means-no fence, tree or other obstruction over 6 feet high may be within the length of half a cricket pitch, and so in proportion; even wire netting will cause considerable obstruction. It is often assumed that so long as there is no obstruction on the generally wet-windy side, rain coming from these quarters will be recorded accurately; this is by no means the case, as eddy currents are set up which seriously interfere with any chance of accuracy (1). It will thus be seen that records, made in gardens, surrounded by trees, etc., can only be very approximate, and that in Public Parks there is a big difficulty (apart from trees) in finding a suitable site since, to prevent mischievous children, grown-ups, and dogs, etc., meddling with same, at least a six foot fence is required; enclosing a circle, whose diameter is not less than a cricket pitch in length.

It may be interesting to record that one inch of rain, almost exactly represents the fall of 100 tons of water per acre.

PLATE II.



I. Brunton—del.

In winter another trouble arises, due to the fact that some of the rainfall takes the form of snow, some of which melts and is absorbed by the ground, so that a measurement of the snow will not give a true idea of the fall, even if the relation between the depth of snow and amount of rainfall was constant (2). To take the snow actually melting into the gauge, together with the superincumbent snow, when melted, is more unreliable as it is impossible to estimate how much may have been blown off by the-

wind. It is therefore necessary to have some means of melting the snow as it falls into the funnel of the gauge (3)

(1) In my case the angle of 10 degrees is only exceeded by few scattered objects at a distance, the maximum angle not exceeding  $12\frac{1}{2}\%$ . The eddy currents set up by scattered objects are comparatively local, and if at a distance may reasonably be neglected.

(2) The relationship between depth of snow and rainfall is variable according to the fineness of the snow; in general 10-12 inches of snow equals one inch of rain.

(3) A small oil lamp or gas burner, or even a night-light under the funnel is satisfactory provided arrangements are made to prevent the moisture, due to the combustion, precipitating on the cold walls of the funnel and running into the container. Where electricity is available a small electric radiator similar to, but smaller than, The Drummond Car Heater, would be preferable.

A somewhat similar trouble arises in the case of the ground minimum thermometer, as a blanket or even a covering of snow or hoar frost, should the sky be clear, may easily lead to an error of six to ten degrees. To ensure accurate results something after the principle of the motorcar windscreen wiper would be required, but this is too costly for the ordinary observer.

The official figure for a rainy day is a day on which .005 inch has fallen the average garden observer however rarely reads below .010 although using a 5 inch gauge .0015 inch is easily recorded.

The most noticeable observations for the last three years, apart from those shewn in tabular form are as follows :-  
1925.

Rain fell on eight days only between January 5th and Feb.

8th with a total of .289 inches. February 11th to 12th the rainfall between 10 a.m. and 4-30 p.m. amounted to .250 inches and the total for the 24 hours amounted to 1.026 inches. On two days only were there two consecutive days without rain between February 8th and May 12th.

Rain fell only on 12 days between May 30th and July 19th, with a total of only .343 inches, and only on two occasions during this period did rain fall on two consecutive days. Heavy rains fell on July 30th-31st (1.081 inch), August 22nd, about noon (1.031 inch in an hour) ; August 23rd to 24th (1.481 of which just over half an inch fell in half an hour, about three in the afternoon). Just under one inch fell during the 24 hours ending October 25th and also November 8th.

1926

Except for the 11 days commencing 10 a.m. June 24th, there was no continuous spell without rain; although the actual rainfall was low from the middle of February to about

the middle of May and no notable heavy rain occurred except for the 48 hours ending 10 a.m. July 7th (1.625 inches).

1927.

The year 1927 will probably go down as one of the wettest years on record, not only in this District but in most parts of England. Although the first six months were below the average, this was more than compensated for by the last six months. As the distribution of the rainfall is shewn on a chart, only the most noticeable features need be mentioned.

On July 5th a violent Thunderstorm occurred about 9-45 a.m. The total rain recorded being almost entirely due to this. The storm lasted for about half an hour, in consequence of which the readings were not taken until about 10.15 a.m. the total rainfall amounting to .547 inch.

AUGUST 22nd.

A severe thunderstorm commenced about twenty minutes to one and lasted for twenty five minutes, during which .487 of an inch fell; after a lull of about half an hour rain again commenced to fall but cleared towards evening only to recommence at night, and by 10 a.m. next morning a total of 1.761 inches had fallen.

During this storm there was a flash of Globular Lightning<sup>4</sup> and the sight screen of the Marton Cricket Club was afterwards found to have been struck. One of the uprights having been split down, as if hacked by an axe, wielded by an unskilled:

(4) Suggestions have been made that Globular Lightning is an optical illusion (it might be due to the flash being seen end-on when travelling almost directly towards or away from the observer). Of the three occasions on which this phenomenon has been observed by the writer<sup>1</sup>, the first was when the flash was travelling away from him; the second when it was travelling along a path at right angles to him, and the third (that recorded here) when it was travelling at an angle. On the first occasion the "Globe" was seen by others travelling along a path at right angles to their line of vision (curiously this struck the Oxford University Cricket Club Pavilion). The question was discussed by the late A. A. Rambaut, D.Sc., F.R.S., Radcliff Observer, and the late F. J. Jervis-Smith, F.R.S., who had done considerable research on sparks from high power induction coils, the verdict being that Globular Lightning did occasionally occur, and could be imitated from an induction coil. It is significant that on the three occasions on which the writer has noticed this phenomenon, it has been accompanied by abnormally violent rain.

person; curiously no scorching was seen, possibly owing to the heavy rain. Splinters of wood were found, in a fan shaped area of about 16 yards; two fragments were also picked up 35 and 50 yards away.

Heavy rain also fell during the night of September 20th21st amounting to 1.172 inches.

For the purpose of comparison all times given above and in the charts are mean Solar time at the latitude of Greenwich ; Act of Parliament Summer time having to be ignored for scientific records.

SUMMARY OF OBSERVATIONS MARTON IN CLEVELAND.

		1925	1926	1927
		24 hours ending	24 hours ending	24 hours ending
Max. in Screen	Highest	86° July 26th	86½° July 14th	79° May 9th.
	Lowest	34½° Dec. 6th	31° Jan. 21st	32° Dec. 21st.
Minimum in Screen	Highest	60° July 18th	—July 11, 61° —July 12th, —13th & 19th	—June 30th 60° —July 30th —Aug. 7th.
	Lowest	17° Dec. 16th	16° Jan. 17th	15½° Dec. 20th. July 30th
				60° —Aug. 7th 8° Dec. 19th.
Minimum on Ground	Highest	57° July 24th	59° —Oct. 4th	60° —Aug. 7th
	Lowest	10° Dec. 16th	8° Dec. 17th	8° Dec. 19th.
Maximum Wind M.P.H.		61½ Jan. 14th.	62½ June 9th.	67 Oct. 29th (10-30 p.m. Oct. 28)
Maximum Rain in inches		1.481 Aug. 23rd	.875 July 7th	1.761 Aug. 23rd.

Page 42.

RAINFALL RECORD MARTON IN CLEVELAND.

MONTH	RAINFALL DAYS			RAINFALL			MONTH	RAINFALL DAYS			RAINFALL		
	1925	1926	1927	1925	1926	1927		1925	1926	1927	1925	1926	1927
Jan.	19	2	15	.751	2.022	1.358	July	14	17	11	2.434	2.383	4.397
Feb.	5	3	17	2.694	1.684	.669	Aug.	14	12	10	4.354	1.804	7.170
March	11	19	12	1.708	.970	2.060	Sept.	7	13	12	1.967	2.971	4.996
April	7	17	11	2.414	.786	1.877	Oct.	9	7	12	2.491	3.968	2.105
May	11	11	18	2.038	1.682	1.467	Novr.	2	4	5	2.857	1.647	4.187
June	24	11	13	.249	2.769	2.661	Decr.	5	15	12	.639	1.674	2.447
Total 6 months	77	63	869	85.44	9.915	10.092	Total 6 months	51	68	72	17.142	14.356	25.368
TOTAL								128	131	158	29.996	24.271	35.460

Page 43.

**Notes on the Cleveland Ironstone from the Eskdale and Grosmont Mines,  
Grosmont; Ayton Banks and Roseberry Mines,**

M. ODLING, M.A., B.Sc., F.G.S. communicated by permission of  
J. J. BURTON, O.B.E., J.P., M.I.M.E., F.G.S.

With the closing of many mines it seems desirable that some of the most recent analyses should be recorded before being lost.

These analyses were made for the Tees Furnace Co., Ltd., in the laboratory at Lackenby Ironworks, the normal routine methods however were not used and only such estimations as were asked for were conducted.

The silica is the true silica, not as is often the case in routine analyses, Siliceous matter which always contains appreciable quantities of Alumina and Iron.

Except in the case of the Grosmont Mine the sampling was done by Mr. Odling, representative samples being obtained from each individual bed or in the case of the main seams in Roseberry and Ayton Banks each 6 inches and after separately crushing an average sample was made by mixing weights of these proportional to the thickness of the beds.

The general character of the bed is as follows :

APRIL, 1918.

SCRAP. A somewhat shaley bed with nodules of Ironstone and many nodules highly impregnated with marcasite ("Sulphur" of the ironstone miners). Varies greatly in thickness at the expense of the underlying bed.

TOP STONE. Compact solid Ironstone with marcasite distributed in small crystals throughout the mass.

BLACK SHALE. Very irregular in thickness within short distances.

BEARING STONE: Compact ironstone, somewhat shaley at the top where it passes into the bed above, marcasite apparently restricted to the lower part.

THICK LIFT. Compact ironstone with scattered oolitic patches associated with marcasite; becoming somewhat darker at the base.

THIN LIFT. Compact Ironstone, largely oolitic with marcasite crystals surrounding the fossils.

BOTTOM STONE. Somewhat inferior and shaley ironstone passing into the shale below.

The analyses are given on the Dry sample-the moisture content varying from 4-5%.

ESKDALE MINE.			GROSMONT MINE			
	GUCH'S ROYALTY RIGHT	GUCH'S ROYALTY LEFT	GREY'S ROYALTY LEFT	No.1 SEC'N	No.2 SEC'N	No.3. SEC'N
Silica	12.60	13.78	17.27	14.55	13.99	13.30
* Alumina	6.54	8.72	10.30	5.50	7.24	9.36
Lime	6.28	7.45	8.75	3.95	11.70	15.00
Magnesia	1.01	5.39	7.43	4.34	3.40	2.73
Sulphur	1.44	.85	.54	.34	.48	.62
Loss on Calcination	.18.17	20.14	18.20	21.76	28.92	23.44
Iron	.27.55	26.81	25.46	25.61	23,70	21.06

- Including oxides of Manganese and Phosphorus

Phosphorus.

Analyses of Ayton Banks and Roseberry Mines Main Seam-Cleveland Ironstone.

#### ANALYSES ON DRY STONE.

The " Sulphur " band at the top is not included, as it is supposed to be picked out by hand. Owing, however, to this not always being efficiently done, the ironstone at the works generally shews about 3 to 4 times as high a sulphur content.

When it is remembered that the sulphur band often carries as much as 51% of sulphur, the inclusion of only small quantities will make a very considerable difference.

	MAIN SEAM.			
	ROSEBERRY MINE.			
	Staveley's Royalty	Pickering's Royalty	Jackson's Royalty	Ayton Banks
Silica	13.22	12.38	14.14	12.62
Alumina	10.81	9.67	11.31	13.98
Phosphorus Pentoxide	1.77	2.17	1.68	1.90
Manganese Oxide	.47	.49	.46	.46
Lime	5.69	6.25	6.18	6.78

Magnesia	3.62	3.30	2.37	1.77
Sulphur	.186	.231	.183	.212
Loss on Calcination	22.99	23.42	22.75	23.88
Iron	29.44	28.83	28.32	27.30
	Moisture on rough stone.			
	8%	7%	7%	5%

## TWO FOOT SEAM AND ASSOCIATED BEDS.

The Section in the Roseberry Mine is as follows :-

Ironstone 1 ft.

Shale 110 1/2 inches.

Ironstone 6 inches.

Shale 18 inches.

Ironstone (the 2 ft. seam) ,... 2 feet.

The analyses of these beds are as follows :

	ROSEBERRY MINES.			AYTON BANKS	
	Top Stone	Middle Stone	2ft seam	average	2ft seam
Silica	11.61	16.9	8.15	10.10	9.10
Alumina	11.09	11.41	11.44	11.33	10.98
Phosphorus Pentoxide . 94	1.74	1.64	1.32	1.75	
Manganese Oxide	.40	.4	.5	.46	.52
Lime	8.75	10.52	9.61	9.49	6.58
Magnesia	2.71	2.98	1.4	2.01	3.27
Sulphur	1.080	1.076	.216	.410	.220
Loss on Calcination	23.81	21.2	27.36	24.45	25.11
Iron	27.5	22.5	27.8	26.95	29.7
	Moisture on Rough Stone				
	5%	5%	5%	5%	6%

Calculated from thicknesses.

## POLLUTION FROM MINE TIPS

The decay of the Marcasite in the " Sulphur" ore and shale picked out from the ironstone, has from time to time produced serious results. Basic sulphates of alumina, and, to a small extent of iron being formed.

These, in the presence of air and lime rapidly give rise to Gypsum and hydrated Alumina in the drains which in time of flood are washed down into other channels, thus polluting the water supply to Farms, with very serious effects on the cattle and in some cases on the vegetation. In a case the author was called upon to examine, it was clear that a little care on the part of farmers in clearing drains, ditches (commonly known as gutters in this district), and drinking troughs, would largely obviate the trouble. The amount undoubtedly is small, but years of neglect in clearing out pipes, etc., has allowed of a considerable accumulation of hydrated alumina which is carried down in time of flood: It is somewhat difficult to understand how it is that the alumina of the shales passes into solution, as the amount of lime in the Ironstone would appear sufficient to satisfy all acid formed by the decomposition of the Marcasite. Possibly the clayey matter in the shales consists to some extent of Hydrated Alumina or Alumina in a very weak state of combination with the Silica and is in part due to chemical precipitation rather than of detrital origin.

### **GEOLOGICAL OBSERVATIONS ON SLAG TIPS**

M.Odling M.A.,B.Sc.,F.G.S.

Slag-tips, at first sight, would not suggest anything for a naturalist to go into rapture about; yet there is ample scope for work by local naturalists on old slag tips in recording their Flora and Fauna

To the Geologist, they present opportunities of studying many problems in regard to igneous rocks. Standing half way between the minute laboratory experiments and the giant phenomena of modern volcanoes, and being much more accessible, many observations can be made. For a right understanding of Past Geological phenomena, an intensive study of present phenomena whether in the field or the laboratory is required.

It is hoped that these few notes will stimulate some Petrologist, which I am not, to give some attention to the phenomena visible in slag tips.

To the student of geology, visits to Slag Tips, where slag has recently been or still is being tipped, would be most valuable; and a much clearer understanding of the volcanic phenomena he reads of in books or hears of in lectures, would result. The "field" is the true class room for budding geologists.

At the present time, blast furnace slag is generally carried away from the furnaces in a molten state and then tipped; some of the slag runs down a bank already hot from previous tipplings, and some flows still further over old cold slag and even into water or at least wet ground.

The conditions, therefore, are in many ways similar to that encountered by flows of molten lava; and all stages from theropy lava, to scoreaceous lava and even pillow lava can be studied.

When, however, the slag has been allowed to practically solidify in the "ladle," and then tipped, other phenomena may be observed. The outside of the slag ball, against the sides of the "ladle," is found to be glossy thus resembling tachylite and on getting further into the "Ball" the structure of the slag becomes more and more crystalline though owing to the air carried down by the molten slag in running into the ladle, there is always a tendency to the formation of Vesicles.

In cooling, the slag contracts, and unless the cooling is very slow, as in the days when slag was left in the ladles, before tipping ladles were known, until it had cooled sufficiently ) allow of easy detachment, the contraction results in strains being set up and the slag breaks up into irregular polygonal figures, analogous to the columns of the Giants Causeway. Owing to the very irregular rate of cooling due to the shape of slag ladles, the columnar structure is not developed.

Recently a peculiar phenomena has been observed in high lime content slags.

After being allowed to solidify in the ladle and then tipped, the slag "ball" appears perfect with its tachylitic skin. After cooling down however, the centre begins to break up and, except for the outside foot or so, crumbles into a coarse powder. This behaviour has been ascribed by Prof. W. G. Fearnside, to Akermanite (Calcium Silicate)  $\text{Ca}_2\text{SiO}_4$ , the Calcium equivalent of Olivine which changes its crystalline form at about 34 per Cent. with an expansion of 9%. This, however, has not been proved, and if it was the case one would expect a difference in the composition of the finest dust of the "Slag Sand" and the coarser particles. Analyses, however, do not shew any marked difference in composition. There is also no appreciable difference between the solid outside and the coarsest and finest particles of the 'Slag Sand:'

PLATE III.



Photo—M.O.

The rapidity with which such a Slag ball breaks up is extraordinary; when once well on the way it would be impossible to take a photograph with even a short time exposure, say 2 seconds, without shewing a distinct blur; a perfectly solid slag ball being reduced to little more than a heap of sand in a few days. The outside shell which is only cracked into blocks by the expansion of the centre portion does not disintegrate or shew any sign of:doing so even after 18 months.

The grading of this sand is as follows :

Retained by 20 mesh sieve under 13/4%.

The remainder shewed the following grading:

Passed through 20 mesh .	Returned by 60	69%
do. 60	do. 90	15%
~ 90		16%

The illustration shews the same slag ball photographed at an interval of 24 hours.

The slag sand strikingly resembles some of the trachytic tuffs, in the Auverne for instance, that one cannot but wonder if they may not have been formed in an

analogous manner, and in some cases be due to spontaneous disintegration of a lava flow in situ.

Some small but very well developed crystals have been discovered in steel works slag. These have a high adamantine lustre, and might easily be confounded with Blende, except that they are almost perfect cubes, actually they are only pseudo cubic. The analysis is as follows:-

Silica	37.40
Alumina	13.88
Manganese Oxide	1.49
Iron Oxide	5.77
Lime	33.76
Magnesia	6.72
Phosphorus Pentoxide	.40
Sulphur	(trace)

which when reduced to a simple formula compares with the mineral melilite, the soda being replaced by Magnesia-thus :-

Melilite	2 Na <sub>2</sub> O	11 CaO.	4 Al <sub>2</sub> O <sub>3</sub>	9 SiO <sub>2</sub> •
Crystal	2 MgO.	11 CaO.	4 Al <sub>2</sub> O <sub>3</sub>	9 SiO <sub>2</sub> •

In Melilite Na<sub>2</sub>O replaceable by K<sub>2</sub>O; CaO by MgO; Al<sub>2</sub>O<sub>3</sub> by Fe<sub>2</sub>O<sub>3</sub> and other sesquioxides.

Prof. H. L. Bowman has examined the crystals, and considers that they belong to the Melilite group.

In the cavities between the slag balls of old Cleveland Slag, a number of Stalactites have recently been found, and differ from the usual, in often being of a brilliant yellow colour. Others are pure white, whilst others are peculiarly knobby, and often covered with small glistening crystals of Gypsum.

'The yellow forms are generally hollow and very brittle, and may be up to six inches in length, often the stalactites are compound, commencing as pure white and ending as yellow or vice-versa.

Analysis of the 4 main types is interesting it being remembered that the stalactites, though capable of being formed of many substances are generally composed of carbonate of lime.

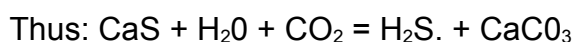
	Yellow Type M.L.240.	Pure White Type M.L.241.	White Green Centre M.L.242.	White and Crystalline M.L.243
Inclusions of undecomposed and partially decomposed slag	1.11	.04	23.26	4.15
Calcium Carbonate	30.49	93.10	7.64	24.53

Magnesium Carbonate	2.29	.61	1.05	1.34
Gypsum	10.58	3.65	28.32	60.33
Free Sulphur	55.07	2.49	39.15	9.40

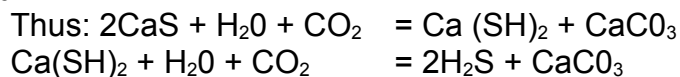
The most striking feature is the Free Sulphur which is so great in the yellow type that it can be easily set on fire with a match. The next most striking thing is the large quantities of Gypsum, except in the pure white type. From whence came these?

It is well known that slag contains about 2% sulphur generally in the form of Calcium Sulphide, though in the case of high lime slags, Prof. Fearnside's considers polysulphides would occur.

Water containing carbonic acid gas attacks calcium sulphides forming calcium carbonate and sulphuretted hydrogen.



The action may, however, take place in two stages, a hydro-sulphide being first formed.



Sulphuretted Hydrogen in the presence of air and moisture is steadily oxidized to water and free sulphur. The Source of the free sulphur is thus accounted for.

The production of Gypsum may be accounted for in two ways ; either by a slow oxidation of the sulphuretted Hydrogen to Sulphuric Acid, which would promptly attack some of the carbonate of lime, or to the direct oxidation of the hydro sulphide formed as above.

Humic acids may, of course, also have played some part in the decomposition of the slag.

The occurrence of the free sulphur in conjunction with Gypsum is of considerable interest. Sulphur round old volcanic vents such as Solfatara near Naples is commonly associated with Gypsum or Celestite (Strontium sulphate) and the production of sulphuretted hydrogen in volcanic gasses has long been considered as due to the decomposition of sulphides of the alkali earths ; the actual deposition of sulphur being ascribed to the interaction of sulphuretted hydrogen and sulphur dioxide ; it would, however, be difficult to account for the presence of the latter gas in old slag tips.

#### **NATURAL HISTORY OBSERVATIONS**

NUNTHORPE      MR. J. J. BURTON.  
MARTON-IN-CLEVELAND      MR. M. ODLING.

SOLITARY ANT MR. M. L. THOMPSON.  
With Notes by MR. T. A. LOFTHOUSE.

Corncrake *Crex pratensis*. Was a regular visitor to Nunthorpe some years ago, whose harsh note could be heard from every meadow. It appears now to have left the district. (J.J.B.)

Not uncommonly heard at Marton in Cleveland during the summer months. (M.O.)

Night Jar *Caprimulgus europaeus*. Has nested for many years in Morton Carr Plantation and brought off regular broods; has been uncommon for some time but occasionally comes ; a young bird was found dead on my rock garden in 1927; so apparently still breeds in the district and old birds were seen in my plantation during the autumn. (J.J.B.)

Lapwing, Peewit or Plover *Vanellus cristatus* ; said to be growing scarce in many parts of the country and the recent Protection Act is welcomed, but there is no evidence of diminishing numbers at Nunthorpe. (J.J.B.)

Plentiful at Marton-in-Cleveland for the last six years. (M.O.)

Heron *Ardea cinerea*. Not common, but during the recent winter and spring 1927-28 one paid very frequent visits to my ornamental water and cleared off every gold fish, some of which had lived there for 20 years. Having exhausted the larder he has now sought fresh feeding water. (.J.B.)

A regular visitor on the Tees Estuary. There are Heronries on the Tees near Gainford and Wycliffe. (T.A.L.)

King-Fisher *Alcedo ipsida*. For many years this somewhat rare bird was a regular visitant of my garden, but I have never found any trace of its having nested. Not seen this year (1927) but one seen by my gardener last summer. (J.J.B.)

Seen on two occasions, Summer, 1927, over my ponds, but as there are no fish, possibly came for newts which are very plentiful. (M.O.)

Blackbird *Turdus merula*. An almost totally white specimen was regularly seen a few years ago (1922 or 23) flying across the Allotment Gardens into Marton Hall grounds near the village; this was unfortunately trapped. A piebald specimen with white head and neck has been an almost daily visitor to Mr. Theodore Wilson's garden at Marton-in-Cleveland since early winter, 1927, and still comes to be fed twice a day (March, 1929). A totally White Blackbird has since been reported from near Brass Castle on good authority. (M.O.)

Jay *Garrulus glandarius*. This handsome bird is only too plentiful and appears to be on the increase. Broad beans and Pea pods being stripped by them. On one occasion last Summer(1927) seven were seen to get up from one row of peas. This spring 1928, possibly owing to the severe weather, 2 double rows 25 feet each, of Broad Beans were completely stripped, being pulled up as fast as they shewed above the ground, thus necessitating the unusual course of sowing in boxes under glass and planting out when about 4<sup>ins</sup> high. Mr. Lofthouse suggests that the Hawfinch *Coccothrauster vulgaris* may have been the chief culprit in this case; as I have had similar trouble with my peas, which I note are one of their chief attractions, this may be so, as the Hawfinch does occur at Marton-in-Cleveland.

In the Yorkshire Agricultural Society's Report for 1928, Jays are exonerated and the blame thrown on the long tailed field mouse. As, however, Jays have not only been seen working rows of peas, in the early morning just as they were coming up, and among the Peas and Broad Beans when in Pod but have also been caught in rat traps baited with freshly shelled peas, they are not above suspicion. (M.O.)

Abnormal Hen's Egg. In April, 1927, an abnormally large Hen's egg was brought to me from Gunnergate, greatly exceeding the ordinary two yoked egg. (M.O.)

This, after weighing and measuring, was hard boiled and an attempt made to cut it in half to see whether three yokes were present, when a hard core resembling the stone of a plum was met with.

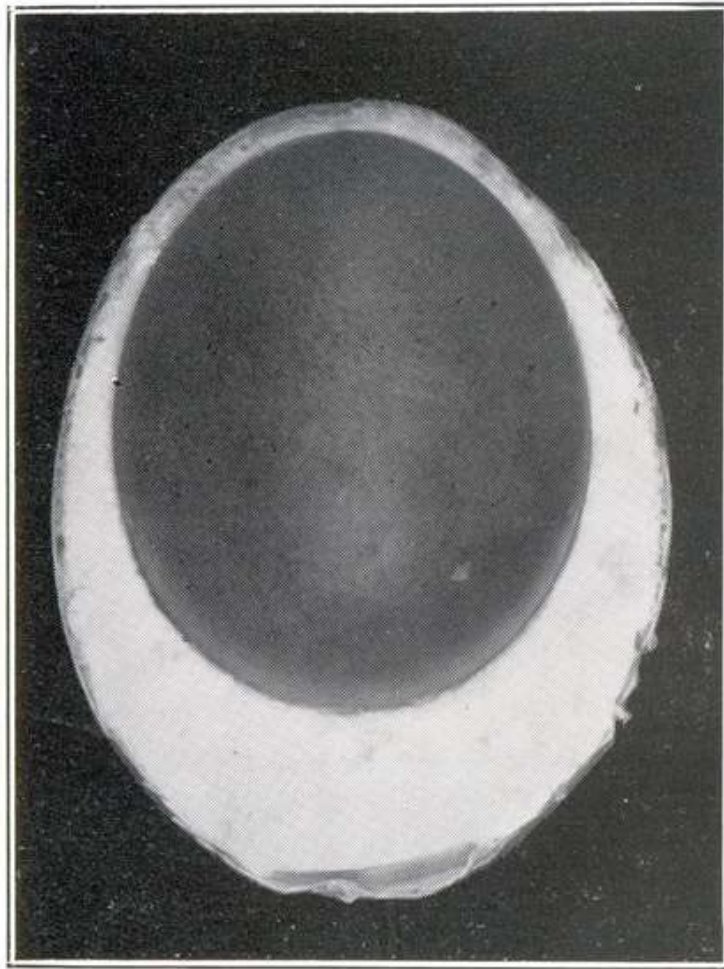
This was found to be a perfect egg complete with shell.

Some few days previously a similar occurrence was met with in the case of one of my ducks with fatal results; the outer shell in this case being broken, a further perfect egg having tried to force it out. It would be of interest to know if ornithologists have met with similar occurrences.

	Abnormal Egg	Normal Egg
Length	31/8ins	23/8 ins
Breadth	25/8 ins	13/4 ins
Polar Circumference	91/2 ins	61/2 ins
Equatorial Circumference	71/4 ins	55/8 ins
Weight	5.093ozs	2.233ozs

The outer shell was nearly white, the inner being dark brown.

PLATE IV.



*Photo M.O.*

ABNORMAL HEN'S EGG,  
SHEWING PERFECT EGG IN THE CENTRE.

Golden 8 Moth. *Plusia moneta*. At the end of June, 1926, a large number of cocoons of this moth were taken from Aconite, and to a lesser extent from Delphinium plants in one garden at Marton, but do not appear to have been noticed in 1927. Mr. Howard, gardener to Mr J. J. Burton to whom a specimen was shewn in 1926 said that he believed that he had seen them occasionally. Mr. Lofthouse writes :-

" This note is of interest as extending the range of a moth " that only came into notice through an extensive migration of the species from the continent in June-July, " 1890,

specimens being captured in several places in " the south of England. It is only recently that it has been "noted in the Northern Counties. This is the first "record I know of for Cleveland. The Caterpillar of " this species stripped some Delphiniums in my garden " at Middlesbrough badly" in May-June, 1927."

An account of its migration will be found in the Vasculum for January, 1926. (M.D.)

Solitary Ant. *Mutilla europaea*. A specimen was found on August 17th, 1927 running across a moorland path in Westerdale.

This example, a female, which is always wingless is only the second record for Cleveland. One, also a female, was found some years ago by Mr. T. A. Lofthouse at the head of Glaisdale. In other parts of North East Yorkshire this insect has only been found on the moors in the neighbourhood of Robin Hood's Bay and Scarborough. The winged male is rare and an interesting account of the distribution of this curious insect, which is parasitic on certain wild bees occurs in Mr. F. Elgee's book :-"The Moorlands of North Eastern Yorkshire."

(M.L.T.)

Purple Toothwort (*Lathraea clandestina*) at Greytowers, Nunthorpe. From information communicated by Mr. Chas. Huitson, gardener to Sir A. J. Dorman.

Some ten years ago this interesting parasitic plant made its appearance in the shrubbery by the Lake, and in recent years has spread rapidly, so that in early June the ground is carpeted with its bluish purple flowers.

PLATE V.



PURPLE TOOTHWORT AT GREYTOWERS.

*Photo M.O.*

How it was introduced is not known, but it is presumed that it was imported on the roots of either Birch or one of the species of Salix. Sir Herbert Maxwell in the *Gardeners' Chronicle* for May 9th, 1925, gives Willow and Poplar and possibly other large trees as its host to which it appears to do no harm, and at Greytowers it would appear to also grow on the roots of Rhododendrons.

Dr. Druce, F.R.S., in a letter, states that he knows of the plant in Suffolk where it was planted by Lady De Sousmarez, and in Cambridge and two or three places in Sussex, but in every case it has been intentionally introduced.

Occurrence of the Grey Squirrel at Marton-in-Cleveland.

During November of the present year (1928), two Grey Squirrels have on several occasions been seen picking up Acorns in the Stewart Park near Eastgate, and the Rev. J. Arnold states that he has seen them frequently at Gunnergate, both in 1927 and 1928.

Mr. T. A. Lofthouse states that they appeared at Ingleby a few years ago.

The Grey Squirrels are descendants of some liberated in Regents Park, London, and have in some districts become a pest in the damage done to young shoots on trees. . Fears have been expressed by some Naturalists that it may eventually completely replace our native Brown Squirrel.

### **DUG-OUT CANOE FROM THE RIVER TEES.**

From Particulars supplied by Mr. F. Elgee.

In the late autumn of 1926 a dug-out canoe was discovered in the River Tees opposite Thornaby High Wood, at a depth of 7-8 feet, below the sand and gravel, forming the present river bed (1). It is now in the Dorman Museum, Middlesbrough. Unfortunately, in raising it, the ends were broken off.

Whilst drying, the canoe has shrunk considerably, and now measures 10 1/2 feet x 2 feet 1 inch at its greatest width; when complete it must have been at least 12 feet long. The gunwales have been rather badly torn away and their highest remaining part is now 8 inches from the bottom of the canoe. Made of a single oak trunk, the canoe still bears traces of the fire which helped to hollow it out, as is shewn by charred wood still adhering thereto. The bottom is pierced by three circular holes (one about the middle and one at either end), each fitted with a cylindrical plug of about 3/8 inch. in diameter, of which the inner ends shew signs of having been broken off. Similar plug holes have been found in other dug-out canoes and were probably for the purpose of draining after beaching.

When originally found, the canoe was pointed at both ends.

In this respect it differs from dug-out canoes from the River Wear and the Calder near Stanley Ferry which had square sterns (2) No other relics having been found with it, the age is uncertain but it would appear to fall within the group III B as defined by Dr. Cyril Fox, who records examples from Glastonbury (of early Iron Age) and Woolwich (of Roman Age) (3): Such canoes have not previously been found north of Deeping Fen, Lincolnshire. Many years ago a canoe containing a man's thigh bone and a dog's skeleton was found at a depth of 27 feet from the surface somewhere between Stockton and Middlesbrough (4).

1.Elgee, F. A relic from the Tees.-North Eastern Daily Gazette, April, 18th 1927.

2.Sheppard, T. The Prehistoric Boat from Brigg. Hull Museum Publications, No. 73, August, 1910.

3.Fox, Cyril. A Dug-out Canoe from South Wales. With notes on distribution, etc. Antiquaries Journal, Vol. VI, April, 1926.

4.Veitch, W. Y. Prehistoric Middlesbrough. Proc. Cleveland Nat. Field Club, Vol. I, page 10.



*Reproduced by permission of the  
North Eastern Daily Gazette.*

## TEES-MOUTH BIRD NOTES.

by C. E. Milburn.

During the last twenty years the aspect of the Teesmouth area of marshland has undergone a big change by the erection of steelworks, zinc works, slag crushing plants, a shipyard and big trunk roads, which run through on both sides of the river. The bird life of this district has not suffered to the extent one would have expected, for, although we have lost the Dunlin as a regular breeder, there have been compensations in the form of an increase in the numbers of other birds. The following notes will give some support to this.

**COMMON TERN** (*Sterna fluviatilis*). Although a pair of these birds used to breed as long ago as 1905, it was not until 1922 that this species established itself at Teesmouth. This was the season when, for some reason, the Fame Islands were practically abandoned by the "sea swallows" and the birds bred on many unexpected places on the coast of Northumberland and Durham. Teesmouth had about ten pairs in that year, and they have progressed so well at our local Ternery that at the present at least fifty pairs nest annually. As the nesting places are not reached without a certain amount of danger, it is hoped the Common Tern will long flourish here to delight us with its graceful flight and ways

**LESSER TERN** (*Sterna minuta*). The numbers of this Tern, which has bred regularly at the Tees since 1902, varies in different years, and from ten to thirty pairs will about give the range. There are breeding sites on both sides of the river mouth, and the Durham site is perhaps the most unusual one in this Country. It is actually inside a shipyard, and to stand in the punching and shearing shed and watch the Terns settling down upon their eggs, laid among the slag, bricks, shingle and rubble of the slipways, must surely be a rare sight. As the Greythorpe shipyard is enclosed all round, the birds are probably more secure here than on the stretches of shingle that are usually chosen for nesting places. These Terns are very bold when they have young, and with most savage swoops will drive away any dog that intrudes upon their territory. I have more than once had my cap flicked off by an angry Tern and few of us can stand the rush down at express speed to within a foot of ones eyes of these birds without involuntarily "ducking."

**SHELD-DUCK** (*Tadorna carnuta*). The tipping of slag at the river seems to have helped rather than hindered the handsome sheld-duck at Teesmouth, and at present the breeding stock will not be less than half a dozen pairs. The long stretches of sea walls and slag reclamations afford ideal nesting places, and coupled with the birds cunning in hiding the locality of its nest, these birds have few enemies. One nest hole in 1927 was about eight feet in the sea wall, and the nest itself well out of sight of the entrance hole. An early brood was noted on May 15th, 1927, being almost a month earlier than usual.

**THE SHOVELER** (*Spatula clypeata*). This duck appears also to be increasing at its breeding places at the marshes of the Tees. At least a dozen pairs breed annually, and on April 28th, I saw four nests in one area of the marsh with 12, 11, 11, and 8 eggs respectively. Shoveler ducks are practically only summer visitors

to the Tees, arriving about the first fortnight in March, and, providing no accident happens to the first nest, leaving as soon as the young can travel. Hence the scarcity of this duck in the shooter's bag in September.

**TEAL** (*Querquedula crecca*). An addition to the list of Teesmouth breeding birds was made on April 28th, 1928, when we came across a nest and eggs of the Teal on Cowpen Marsh. Carrion Crows, the egg sucking pest of the place, accounted for the first laying, but the birds are nesting again. Previous to this my only other locality to find the Teal breeding in South East Durham was at Hurworth Burn.

**RINGED PLOVER** (*Aegialitis hiaticola*). Though not quite as numerous as formerly, still manages to adapt itself to changed circumstances. As well as frequenting the shingle patches for breeding places, the broken slag of some of the low "tips" form a substitute for the usual shells for a nest lining, and on the Durham side, the shipyard provides a sanctuary for four or five pairs.

**REDSHANK** (*Totanus calidris*). Is general now where-ever there is enough marsh or swamp to afford it the ground it likes. All along the Billingham, Portrack, and Mandale "bottoms" right down to the mouth of the river, the bird can be met with now, but on the Coatham Marsh the bird has decreased. The Redshank now seems quite as abundant as the Lapwing in the areas mentioned.

## REPORT ON LEPIDOPTERA OBSERVED IN CLEVELAND

by T. Ashton Lofthouse, F .E.S.

\*Denotes species recorded in Proceedings for first time. \*\*Denotes species recorded for first time for Yorkshire.

The following Report on Lepidoptera occurring in the Cleveland District is compiled from observations made from 1912 to 1915.

### RHOPOLOCERA.

**Vanessa urticae**, **V. atalanta** and **V. cardui**. All noted together on flowers of *Sedum spectabile* in garden at Linthorpe, in September 1914. .

**Vanessa io**. Specimens in collection presented to Middlesbrough Museum, collected at Carlton-in-Cleveland. Seen at Linthorpe on 16th September, 1917, and at Middlesbrough on October 11th.

**Thecla rubi**. Noticed at Kildale on May 4th, 1913 and at Westerdale on May 24th, 1915. This Butterfly seems to occur on Bilberry on most of the moors in the Cleveland District.

### SPHINGES.

**Acherontia atropos**. Two or three specimens taken at light near Redcar in August, 1914. One at Middlesbrough July 20th, 1912 and one at Loftus, July 23rd, 1912. (Frank Elgee).

**Sphinx convolvuli**. Specimen taken at light near Redcar on August 24th, 1914, and one near Co-operative Stores, Linthorpe Road, Middlesbrough, on November 8th, 1914, (Frank Elgee). Seven brought to Middlesbrough Museum in September 1917, taken at Acklam, Middlesbrough, Great Ayton.

### NOCTUAE.

\***Axylia putris**. Specimens in a collection presented to the Middlesbrough Museum stated to have been taken in the Great Ayton district.

**Apamea unanimitis**. At sugar in garden in June, 1915.

**Panolis piniperda**. Bred a few specimens (from larvae taken off Firs in Kildale), in April 1913. They seemed to emerge about 8-30 a.m.

**Taeniocampa populeti**. Taken off willows at Kildale on April 21st, 1913.

**Hadena adusta**. At sugar in garden in June, 1915.

#### **GEOMETRAE.**

**Tephrosia bistortata**. The well-marked dark Larch feeding species, at Great Ayton on April 19th, 1913.

\***Gnophos obscuraria**. Observed at Saltburn on August 1st, 1915.

**Asthena blomeri**. At Kildale in 1912 and 1915. *Emmelesia alchemillata*. Kildale.

\***Eupithecia succenturiata**. In collection presented to Middlesbrough Museum as taken in Ayton District.

**Eupithecia pygmaeata**. Near Great Ayton on May 29th, 1913.

\***Eupithecia valerianata**. Larvae taken in flower heads of Valerian at Kildale in August, bred in following June.

\***Eupithecia albipunctata**. Bred a specimen at the end of May, 1915, from larvae taken in Angelica seed heads in October of the previous year.

\***Eupithecia albipunctata var angelicata**. Bred two fine specimens of this melanic form from larvae taken at same time as above.

**Eupithecia minutata**. Great Ayton and Lealholm.

**Eupithecia abbreviata**. Several on Oaks at Kildale in April 1913.

**Eupithecia exiguata**. Bred from larvae beaten out of Blackthorn, Ingleby Greenhow.

**Coremia munitata**. Noticed at Great Hograh in Baysdale.

#### **PRYALIDES.**

\***Ebulea crocealis**. Specimen taken in Garden at Linthorpe, on July 22nd, 1915, about *Inula glandulosa*, on which plant it had probably spent its earlier stages.

**Hydrocampa nympheata**. Occurred fairly freely about a Pond near Acklam in June and July, 1913-14, some of the specimens being much darker than usual.

#### **TORTRICES.**

\***Tortrix xylosteana**. Beaten out of Oak at Kildale, in August and at Hilton-in-Cleveland, on July 24th, 1915.

\***Tortrix cinnamomeana**. At Kildale in July, only one record for this species in the Yorkshire list.

**Amphisa gerningana**. In Baysdale, in July 1912, and Lealholm in 1914.

\***Amphisa prodromana**. Bred on April 15th, 1913, from larvae taken in spun up Valerian flower heads in the previous year near Kildale.

**Leptogramma literana**. Single specimen taken at Ingleby Greenhow, on March 3rd, 1912.

\***Peronea rufana**. Taken at Saltburn on March 31st, 1909.

**Peronea schalleriana**. Aislaby, September 1914 and 1915.

**Peronea comparana**. Aislaby, 1914 and 1915.

**Peronea ferrugana**. Great Ayton, May 5th, 1913.

\***Peronea fissurana**. Great Ayton, September 1914, also in September and October in previous years. This species only described in the Entomologists' Monthly Magazine 3rd. Series, Vol. 1, p.p. 325-6, 1915, by Mr. F. N. Pierce and the Rev. J. W. Metcalfe, it having been mixed up with the previous species (*ferrugana*), the whole of my series taken in this district with one exception, were referable to this species. Generally beaten out of Oak.

**Peronea caledoniana**. Baysdale, July 14th, 1912. Glaisdale, August 1915.

**Rhacodia caudana**. Beat several specimens out of shallows in Lonsdale, on August 17th, 1913, including some nicely marked forms.

**Dictyopteryx loefligiana**. Taken at Kildale, Hilton and Saltburn.

**Dictyopteryx bergmanniana**. Kildale.

**Ptycholoma lechiana**. Bred off aspen, Kildale.

**Penthina sauciana**. Flying freely over Bilberry in early afternoon, 2 to 3 p.m., at Kildale, on July 13th, 1912.

**Hedya lariciana**. Taken sparingly throughout the month of July, 1912, at Kildale, generally beaten out of Larch, noticed flying in the early evening high up about the tops of the Larch branches on one or two occasions.

**Mixodia schulziana**. Fairly plentiful on June 13th, 1914. seemed to be mostly about *Empetrum nigrum*.

**Sciaphila pascuana**. Had the whole of my *Sciaphilas* examined by Mr. F. N. Pierce recently, and found that I had specimens of this species from Redcar and Middlesbrough.

\***Sciaphila sinuana**. Beaten out of Firs, etc., alongside "rides" in Kildale Woods.

**Clepsia rusticana**. At Great Ayton, and in Westerdale, the latter specimens being taken on May 24th.

**Phoxopteryx lundana**. Linthorpe, Middlesbrough, in May, also noticed again in September.

\***Phoxopteryx mitterpacheriana**. Single specimen, Great Ayton, June 22nd, 1912.

**Grapholitha nisella**. Several taken at Kildale on August 17th, including some very nicely marked forms. Sit on Sallow tree trunks but are very "skittish" flying off and dropping suddenly down into the undergrowth.

**Grapholitha cinerana**. Bred from larvae taken spun up in Aspen leaves, Kildale.

**Grapholitha nigromaculana**. Taken about Ragwort at Kildale.

**Grapholitha subocellana**. Nice series bred in May from larvae taken in rolled up willow leaves in September.

**Grapholitha trimaculana**. Beaten out of Wych Elm at Hilton in July, also taken at Kildale on Aug. 14th, 1915.

\***Grapholitha naevana**. About Holly at Kildale in August, 1913, and at Sleights in August, 1914.

**Hypermezia angustana**. Kilton Woods, near Loftus.

\*\***Paedisca rufimitrana**. Single specimen taken in Kildale Woods on July 27th, 1912. This is an addition to the Yorkshire list.

**Paedisca occultana**. Fairly common to well into August.

One specimen taken in August 1912, was an interesting variety, the upper wings being of a reddish tinge in place of black. This insect when beaten out of Firs, as a rule, drops straight down into the grass under the tree or shoots down obliquely.

**Ephippiphora brunnichiana.** Swarmed in places about Coltsfoot in Kilton Woods on July 4th, 1914, flying in the sun from 2 p.m. onwards.

**Ephippiphora turbidana.** Noticed at Kildale fresh out on June 14th, 1913.

\***Ephippiphora trigeminana.** Single specimen on fence at Kildale in July, 1912. Several Specimens at Sandstnd on June 20th, 1914, seemingly about Fleabane plants.

**Olindia ulmana.** This species of which I had only taken odd specimens previously, occurred very freely at Kildale on July 19th, 1913, flying in sun about noon and in early afternoon about " Butter-bur " and under and about Wy'ch Elm.

\***Coccyx strobilella.** Bred during April, 1912 from Spruce Cones collected in the Great Ayton district, also on May, 21st and early June, 1915 from cones collected at Ingleby Greenhow, the emergence of the latter no doubt being retarded by the extremely cold spring.

**Coccyx nanana.** Noticed flying in sun about 2-30 p.m. on July 6th at Kildale about Spruce trees.

**Coccyx vacciniana.** Single specimen at Great Ayton on June 29th, 1912. Few specimens flying about Bilberry in Westerdale in sun from 2-30 to 3-30 on May 24th, 1915.

**Pamplusia mercuriana.** In Baysdale on July 14th, 1912. At Kildale on July 20th, 1913.

\*\***Retinia turionana.** Single specimen taken among young Firs at Kildale on May 18th, 1912. On looking over my Retinias taken in previous years in this district, I found another specimen among the R. pinivorana. This is an addition to the Yorkshire list.

**Stigmonota dorsana.** Fairly plentiful in May, 1912, flying from 3 to 3-30; took 3 nice aberrations; specimens with shortened stigma and stigma divided into two parts.

**Stigmonota orobana.** Worked localities along the coast where the food plant of this species occurs (*Vicia sylvatica*) but only succeeded in taking a single specimen fresh out on June 20th, 1914 at Sandsend.

\***Dicrorampha petiverella.** Single specimen along side of Leven at Hilton on July 24th, 1915, flying in the afternoon sun.

\***Dicrorampha plumbana.** Flying in afternoon sun at Sandsend on June 20th, 1915 and at Saltburn on a later date.

**Dicrorampha herbosana (tanaceti).** Freely on Achillea plants in Garden, Linthorpe, flying about them in the early evening.

\***Catoptria hypericana.** Taken in Kilton Woods on July 31st, 1915.

**Eupoecilia atricapitana.** Saltburn, 25th June, 1914.

**Eupoecilia maculonana.** Kildale, June 22nd, 1912.

**Xanthosetia zoegana.** Saltburn and Sandsend in August.

**Argyrolepia cnicana.** Several at Sandsend on June 20th.

**Conchylis straminea.** Sandsetid, June 20th.

## TINEAE.

**Lemnatophila phryganella.** Several noticed flying in sun near Ingleby Greenhow on October 19th, 1914.

\***Exapate congelatella.** Plentiful. on restricted portion of high moors above Battersby flying between 1 and 2 p.m. and sitting about on tops of heather especially burnt stems on October 19th, 1914.

**Epigraphia steinkellneriana.** Single specimen off tree trunk at Kildale on April 30th, 1913.

\***Ochsenheimeria bisontella.** Flying in sun at Great Ayton on August 3rd, 1912.

\***Scardia arcella.** Beaten out at Kildale on August 3rd, 1912.

**Blabophanes rusticella.** Redcar, June.

\*\***Blabophanes weaverella.** This species is not included in the " Entomologist" List. Noticed flying in afternoon sun near Firs on June 15th, 1912 and June 13th, 1914 and sometimes beaten out. On examining my series of *B. rusticella* I found that almost the whole of the local specimens were referable to this species. It is interesting to note that this species was originally described and added to the British list by John Scott, an Entomologist of considerable note, who lived many years in Middlesbrough.

**Tinea fuscipunctella.** Great Ayton, Middlesbrough.

\***Tineola biselliella.** Middlesbrough. Kildale.

**Incurvaria muscaeiella.** Flying freely in sun about noon in Garden at Linthorpe on April 23rd, 1914.

\***Incurvaria oehlmanniella.** Kildale, May 4th, 1913.

**Micropteryx seppella.** Battersby and Great Ayton. June 4th and June 14th, 1913.

\***Micropteryx aureatella.** About Bilberry at Great Ayton May 31st and June 14th, 1913.

**Micropteryx subpurpurella.** Plentiful among oak at Kildale, Battersby, etc., at end of April.

\***Micropteryx sangii.** On Birch in Baysdale.

\***Adela fibulella.** Ayton, Kildale, Battersby and Nunthorpe, about Flowers of *Veronica chamedrys*.

\* **Adela rufimitrella.** - On flowers of *Cardamine pratense* at Battersby on June 1st, 1914.

\* **Adela cuprella.** Single specimen about Bilberry at Great Ayton on May 31st, 1913. Only once recorded in Yorkshire list.

\***Swammerdamia pyrella.** Flying freely along hedge side at Ingleby Greenhow in early evening of June 22nd, 1912.

**Plutella mulipennis** (*cruciferarum*). Known as the turnip moth, one of the Farmers' pests, the caterpillars doing great damage to the young Turnip plants, etc. This insect was exceptionally abundant in 1914 all over the district, in the gardens, on the moors and at the sea-side, swarms being noticed at Redcar, Whitby, Runswick, on the Cleveland Hills, in fact everywhere from April to the end of Summer.

**Cerostoma sequella.** Several specimens taken at Kildale in July, 1912, almost invariably at rest on sycamore tree trunks in restricted locality. Sleights, 1914.

\***Phibalocera quercana.** Beaten out of Oak at Kildale in August, 1912 also near Faceby in 1915.

**Depressaria assimilella.** Larvae plentifully spun up in Broom at Kildale in early May. First moth bred on June 15.

**Gelechia mulinella.** About Gorse at Saltburn.

**Gelechia longicornis.** On moors at Westerdale, May 24th, 1915.

\***Brachmia mouffetella.** Single specimen at Kildale, August 1st, 1913.

\***Bryotropha senectella.** Mandale Bottoms.

**Lita maculea.** Kildale, August 24th, 1912. Aislaby, September, 1915.

\***Lita fraternella.** Beaten out at Kildale on August 17th.

**Teleia dodocella.** Several beaten out of Firs at Kildale in July.

\***Brachycrossata cinerella.** At Kildale and Ayton. June and July. Only recorded once in the Yorkshire List.

**Dasycera sulphurella.** Flying freely in early morning sun and resting on Pergola posts in garden at Linthorpe, and it was very evident that the larvae had been feeding up on the dead wood.

\***Oecophora fulvigutella.** Bred freely at end of July and early August from larvae taken spun up in Angelica seed heads in the October previous at Kildale.

**Glyphipteryx fischeriella.** Several flying about hedgeback near Ayton and sitting on Gorse Bushes about 2 p.m. Noticed also near Nunthorpe flying in the afternoon sun on June 19th, 1915.

\* **Argyresthia ephippella.** Swarmed about Bird cherry in July at Kildale.

\* **Argyresthia semitestacella.** About Birch in Eston in September, fairly common.

\* **Argyresthia albistria.** Occurs at Kildale, Ayton, Kilton, etc., about Blackthorn hedges.

\***Argyresthia conjugella var aerariella.** Took some specimens of this interesting form of *A. conjugella* at Kildale in July, 1912 and as early as June 14th in 1913 about Mountain Ash.

**Argyresthia spiniella.** Beaten out of Mountain Ash at Kildale in August, 1914.

\***Argyresthia semifusca.** Occurred freely at sugar in the garden at Linthorpe on about August 22nd, 1913.

\***Argyresthia retinella.** Several beaten out of Birch at Kildale in July.

**Argyresthia atmoriella.** About Larch and Scotch Fir at Kildale.

\*\***Cedestis gysselinella.** Beaten out of Firs at Great Ayton at the end of July, 1913. This species is an addition to the Yorkshire list.

\***Ocnerostoma piniariella.** About Firs at Kildale in June.

**Coleophora fabriciella.** Single specimen on May 25th, 1912, at Ayton.

\***Coleophora pyrrhulipennella.** Flying about heather on Coat Moor on July 18th, 1913.

\***Coleophora vimitella.** Kildale, July, 1913.

\*\***Laverna hellerella.** This species occurs freely at times in the garden at Linthorpe flying about Apple trees just before dusk in early August.

\***Laverna atra.** Beaten out of hedge at Linthorpe in early June.

**Elachista albifrontella.** Mandale Bottoms in June.

\***Elachista atricomella**. Occurred very freely about boggy ground near Kildale Station on August 31st, 1912.

\***Elachista luticomella**. Mandale Bottoms, June 27th, 1912.

**Elachista cerusella**. Mandale Bottoms.

\***Elachista triatomea**. Mandale Bottoms.

\***Lithocolletis vacciniella**. Bred in June from larvae obtained from mined evergreen Bilberry leaves (*Vaccinium oxycoccus*) on Coat Moor in May, 1912.

\***Lithocolletis pomifoliella**. Kildale.

\***Lithocolletis alnifoliella**. Bred from Alder, Kildale.

\***Lithocolletis heegeriella**: Great Ayton.

\***Lyonetia clerckella**. Kildale, Sleights, and Eston.

\***Cemiostoma spartifoliella**. About Common Broom at Kilton, Lealholm and Sleights.

\*\***Cemiostoma walesella**. Taken on and about *Genista tinctoria* at Salt burn, June 4th, 1914.

\*\***Opostega saliciella**. Taken in garden at Linthorpe and at Acklam.

\***Bucculatrix cristatella**. Great Ayton, July, 1913.

\***Trifurcula immundella**. Beaten out of Common Broom at Lealholm, Sleights and Kilton Wood in July, and early August.

**THOMAS FIELD WARD, J.P.**  
BORN 1843. DIED 6th JULY, 1921.

A long period of failing health somewhat prepared the friends of Thomas Field Ward for the news of his death, which occurred very peacefully at the age of 78 years, on the 6th July, 1921, at his home, The Park, Middlesbrough.

Mr. Ward was born at Banbury. He commenced his business career with the firm of which the late Sir Bernard Samuelson was the head, and who were then Manufacturers of Agricultural Implements in that town. Later, he spent some years with Accountants in Birmingham, and in 1870 returned to be chief Accountant with his former firm at their Newport Iron Works, Middlesbrough. He was appointed Secretary when the business became Sir B. Samuelson & Co., Ltd., and later a Director, which office he held until his retirement in 1915.

Mr. Ward was one of the original members, and took an active part in the formation of the Cleveland Naturalists' Field Club. At all times afterwards, he took the greatest interest in its work, and was most diligent in promoting its progress and success. He was President for the years 1884, 1885, 1901 and 1902. He was a Vice-President from the inauguration of the Club to his death, and as Treasurer, was responsible for the Club's Accounts for a great many years. He was also a member of the Yorkshire Naturalists' Union, and was a regular attendant at its meetings for a long period. He took special interest in the compilation of "The Handbook of Middlesbrough & District," issued by the Club in 1881 on the occasion of the visit of the "Iron & Steel

Institute" to Middlesbrough, containing historical, scientific and industrial information about Cleveland.

Mr Ward was a good all round naturalist, and excelled as a botanist. There were few rare plants in Cleveland whose habitats were not known to him, and one may be assured none suffered from his knowledge. He was a frequent leader of the Club's excursions, and few knew the topography of the hills, dales and wide plains of Yorkshire better than he did. He was a great walker, never hurrying, a quick observer, and ever had his mind open for the reception of new facts and impressions.

Though of a quiet, unassuming and retiring disposition, and so disinclined to accept prominent offices, the force of Mr. Ward's character and his persistence were strongly felt in support of every good cause, and especially behind movements for the promotion of culture, or for the relieving of human suffering. Thus he was an untiring member of the House Committee of the North Riding Infirmary, and the Chairman of that Committee from 1903 to 1917, and as such, he did much to promote the progress and efficiency which that Institution has always maintained. He was an equally active member of the Free Library Committee, the Cleveland Literary & Philosophical Society, the Middlesbrough University Extension Society, and the Old Students Association, for long periods. He served as a Justice of the Peace for Middlesbrough for a number of years.

Mr. Ward too, had a vigorous and independent but reverent mind, and so it is not surprising to find him a strong Unitarian in religion.

Mr, Ward had a valuable and varied Library which assisted to feed his strong yearning for knowledge. He had travelled much in the Alps, Italy, Tyrol, and Southern Germany, as well as in his own land. He had an artistic temperament, and was very fond of works of art. These qualities, coupled with his strong love of nature and of walking on the breezy uplands, made him at all times an entertaining, instructive and delightful companion.

It has been an inspiration to the writer to know many members of the Field Club, but none more than Mr. Ward. Quiet, gentle, restrained, and sympathetic in character with a rigid sense of truth and right, he has left behind him a fragrant memory with all who knew him, and the absence of his stimulus and influence in the Club, is an almost irreparable loss. He was a firm believer with Plato, "That truth and beauty and righteousness are the highest things and the things a man may keep:"



THE LATE THOMAS FIELD WARD.

**JAMES MATTHEW MEEK, M.A.**  
BORN 1846. DIED 23RD OCTOBER, 1927.



THE LATE JAMES M. MEEK.

Mr. J. M. Meek, who was the fourth senior member of the Cleveland Naturalists' Field Club at the time of his death, died on the 23rd October, 1927, at his residence, Coatham, Redcar

Mr. Meek came of an old York family, being a son of Sir James Meek, of Middlethorpe Lodge, York, a gentleman intimately concerned in the inception of Railways about the forties, and who was a Director of the Great Northern Railway at the time of his death in 1891. There was rather a large family, most of whom attained distinction in life; one Mr. Wm. Alfred Meek, being a well-known King's Counsel, and for many years Recorder of York.

James Matthew Meek was educated St. Peter's School, York, and Trinity College, Cambridge, where he graduated with Mathematical Honours in 1869, and shortly afterwards took his degree of M.A. He was a strong and active Churchman throughout his life.

Mr. Meek chose the Solicitors branch of the legal profession and was admitted in Easter Term 1872. Later, he joined the late Francis Stevenson in partnership at Darlington, and in 1878 the firm opened an office in Middlesbrough which, on a dissolution of the partnership, was taken over by Mr. Meek, and he then definitely settled in Middlesbrough. Mr. Meek was a good lawyer, and made a prominent name in his profession, gaining the confidence and respect of a large circle of clients and friends. He was Honorary Secretary of the South burham & North Yorks. Law Society for upwards of thirty years, and as such, he gained the gratitude and esteem of his profession by his untiring zeal in promoting its interests a high standard of efficiency, and in seeking to maintain the highest ideals in its practice.; This esteem and gratitude was cordially acknowledged on his retirement at a Dinner given to him by his colleagues and by the presentation of a piece of silver.

He was much interested in education and culture. He was Clerk to the Governors of Sir William Turner's School, and for long, a prominent member of the Middlesbrough University Extension Society.

But it was because of his keen delight in, and sympathy with nature, that the members of the Club will remember him best. He was a keen geologist and antiquarian, and also assiduously followed the rapid advancements in the science of astronomy. This brought him to join the Club in early life, and he remained a member until his death. He was President in the years 1888 and 1897, and a Vice-President for 29 years. For many years he was a very regular attender of the Field Club Excursions and other meetings, though the infirmities of age prevented him from doing so for some years prior to his death. He was the discoverer of the Plant Bed in the Estuarine Series of the lower Oolites in the Marske Quarry, and he and the late Rev. John Hawell, by their work on this and similar plant beds, contributed a series of striking facts to Palaeobotany.

Mr. Meek was a quiet and steady worker during his long life of 81 years. Though bodily infirmity somewhat impaired his physical powers during his last few years, yet his mind and memory remained undimmed. He continued to practice his profession down to the end. His last illness seized him whilst one morning entering his office door to commence his usual office routine. The last conversation the writer had with him over lunch only a very few days before, was on the theory of "Continental drift," and about Wayside Crosses. No doubt Mr. Meek had an excellent physique, for he was a tall, straight, gentlemanly, and commanding figure, but one cannot doubt that his love of nature and the outside, contributed to his long age and vigour of mind. Whenever he could secure a breathing space from the demands of an exacting and confining profession, he escaped into the wide and wild places of nature, there to pursue his favourite sport of angling (for he was a keen salmon fisher in Scotland and Ireland as well as nearer home), or to follow up his geological work.

He was a man of high endeavour, with a cultivated and enlightened mind. There was nothing mean or shabby about him. He had a most lovable personality, and so he passed on beloved by all the members of our Club who knew him, and of his profession, and by a wide circle of friends. Mrs. Meek had died some years before, but his last days were passed in the calm, quietude of his restful home and library, tended by all the care and affection which the love of his daughters could give.

J.W.R.P.

**WILLIAM GEORGE APPLEYARD, M.B.E.**  
BORN 1866. DIED 16TH JANUARY, 1929.

The sudden and unlooked for death of Mr. W. G. Appleyard which occurred on the 16th January, 1929, after a very brief illness, deprives the Club of one of its most genial and useful members. Although the late Mr. Appleyard's association with the Club was not of long standing, his hearty support of all its activities rendered him a most useful and helpful comrade. While not specialising in any particular branch of the Club's work, he exhibited a lively interest in whatever the Club had in hand. Those who were privileged to be in his company during the Club's Whitsuntide visit to Coxwold in 1927, and to Upper Teesdale in 1928, retain lively and pleasant recollections of his geniality and help on those occasions. His desire was always to find some sphere in which he could be useful to the members, and the writer of this memoir recalls with pleasure the deep interest he took in visiting the old Parish Churches in the vicinity and noting their Archaeological and Historical features. In the Public life of Middlesbrough he gave unsparingly of his time and labour, and laid the community under a deep obligation to him for his devoted services for the common weal.

His services in public life were recognised in 1927 by His Majesty the King in conferring upon him the honour of a Member of the British Empire, on which occasion the Club took the opportunity of conveying its congratulations by presenting him with an illuminated address embodying its sincere appreciation of the honour which he had received and its recognition of his personal worthiness of the same.

Mr. Appleyard became a member in the year 1923, and in 1928 was elected on the Committee of the Club, a position for which he was eminently suitable. Since he became a member he was one of the most conscientious in joining the various expeditions, and thoroughly entered into the spirit of the same.

It is pleasant to recall that these excursions were the means of bringing into his life some of the happiest days he had experienced, and whilst the Club will miss his Counsel and advice as a member of the Committee, and his genial presence on its excursions and at its lectures, it will still retain the happiest recollections of one who endeared himself to the members, and sought in every way to uphold and maintain its highest traditions.

C.P.



THE LATE W. G. APPLEYARD, M.B.E.

WINTER MEETINGS.-Meetings are held during the Winter months, particulars of which are sent out before each Meeting to those members applying for same on the card sent with the Syllabus. The Secretary will be glad to hear from Members willing to give Papers or show Exhibits.

MEMBERS' PRIVILEGES.-Members receive the Proceedings, copies of Syllabus of Summer and Winter Meetings, Associate Card of Membership of the Yorkshire Naturalists' Union, and other Societies to which the Club is affiliated, and have access to the Society's small Library.

SUMMER MEETINGS.-During the summer numerous expeditions are conducted to places of Natural History and Archaeological interest in the immediate district and further afield.

THE LIBRARY which consists of works on Science, Natural History and Archaeology, is placed (on loan) in a case in the Dorman Museum and is accessible to Members on application to the Curator. Donation of works on the above subjects, especially those relating to Cleveland, are at all times acceptable.

HAWELL BEQUEST.-Under the will of the late Rev. J. Hawell, M.A., F.G.S., Members have the special use of the Library of geological, conchological, and other works, as well as access to the large and valuable collections of Mollusca and Fossils bequeathed by him for the benefit of the Cleveland Naturalists' Field Club and the Dorman Museum. These may be inspected at any time by Members at the Museum, on application to the Curator or his Assistant.

MICROSCOPIC SLIDES (BOTANICAL).-The Botanical Slides made by Mr. R. Barnes, and purchased by the Club, may also be seen at the Museum.

MEMBERS' OBSERVATIONS.-Members are asked to notify the Secretary of any new localities for any particular Fauna or Flora, or new excavations of Geological interest, in order that they may be visited and recorded. Members having specimens requiring identification should apply to the Curator of the Dorman Museum.