

S 29.

TRANSACTIONS

OF THE

Cumberland and Westmorland Association

FOR THE

*ADVANCEMENT OF LITERATURE
AND SCIENCE,*

No. X.—1884-85.

EDITED BY J. G. GOODCHILD, F.G.S., F.Z.S.,

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION;
H. M. GEOL. SURVEY.

PRICE TO MEMBERS, ONE SHILLING.

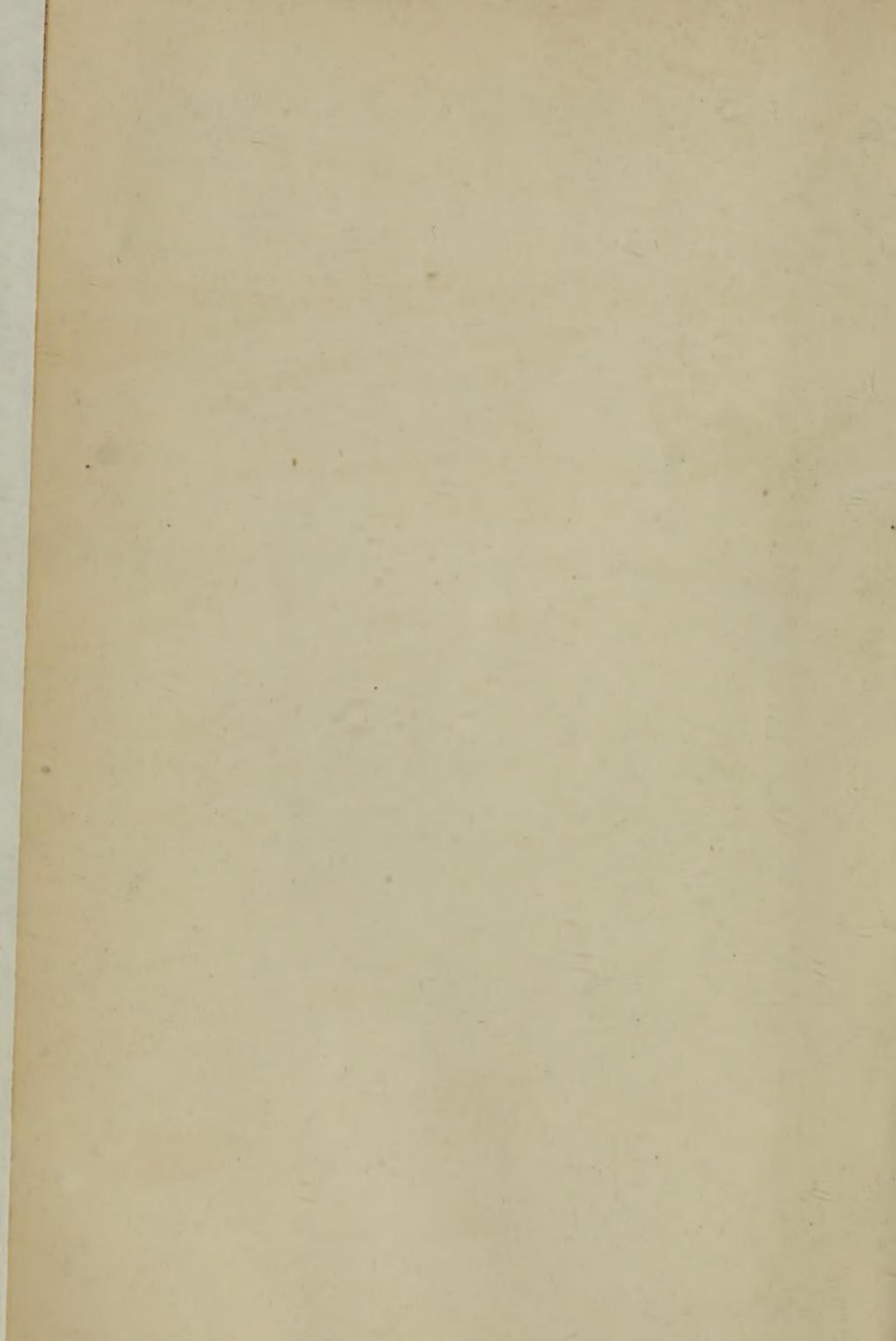
NON-MEMBERS, TWO SHILLINGS AND SIXPENCE.



CARLISLE :

G. & T. COWARD, PRINTERS, SCOTCH STREET.

1885.



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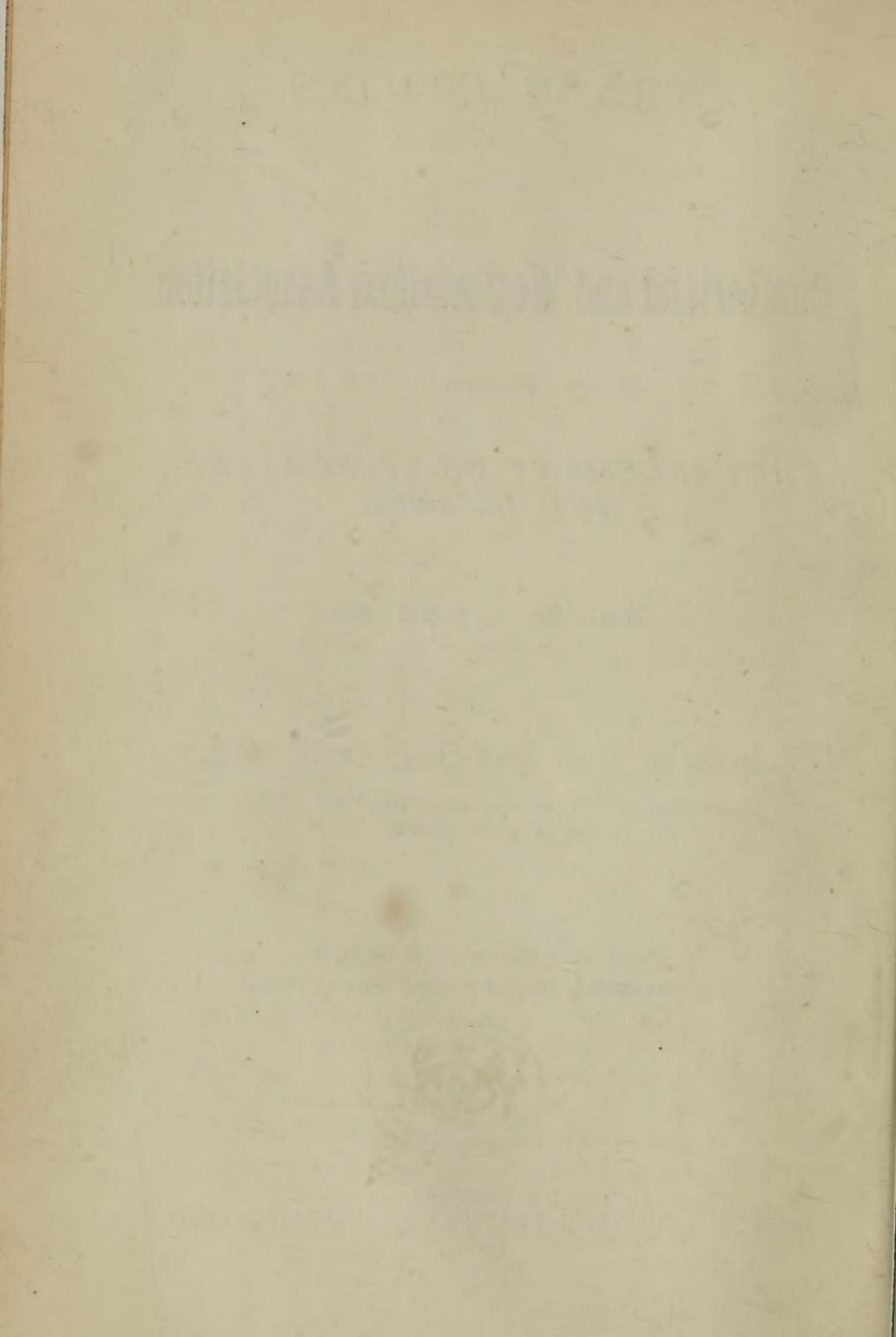
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NOTES.

Much matter of interest has had to be omitted in this Number owing to want of space.

Spare Copies of Nos. 1, 3, and 4 of the TRANSACTIONS will be gladly received by the Secretary (Mr. Crowder, Stanwix, Carlisle), and One Shilling will be allowed for each copy.

CUMBERLAND & WESTMORLAND ASSOCIATION FOR THE ADVANCEMENT OF LITERATURE AND SCIENCE.

Proceedings at the Annual Meeting at Bowness, 1885.

THE TENTH ANNUAL MEETING of the Association was held this year at Bowness-on-Windermere, on *Tuesday and Wednesday, June 2nd and 3rd.*

The Proceedings began, as usual, with the Address of the retiring President, Mr. R. S. FERGUSON. The subject was "Potsherds and Pipkins," being an able sketch of the rise and progress of the potter's art from the earliest times.

The party—now numbering about seventy—afterwards sat down to lunch at the Old England Hotel, at the close of which Mr. W. H. Schneider, the President of the Windermere Literary and Scientific Society, said a few words on the rise and progress of Barrow, which he justly described as being almost unique among English towns during the present century. When he first came to it in 1839, there were only about half-a-dozen houses. In 1859 began its real era of progress with the opening of the Park Mine, its population increasing in the two following years from 700 to 3,000. In 1871 the number was 18,000; in 1881, 47,000; and in 1883, 53,000. Having received much interesting information on the steel works, to which Barrow owes so much of its rapid advance, the company, to the number of about one hundred and twenty, embarked on Colonel Ridehalgh's beautiful steam-yacht *The Britannia*, which had been most kindly placed at the disposal of the members, and had a pleasant sail to Lake Side. Here a special train was waiting to take the party to the Barrow Steel Works; arriving at 3-30. Divided into parties of twenty-five, each accompanied by a courteous guide, the members were shown the various processes of iron and steel making. The smelting furnaces were visited, and then the grooved sand beds into which the molten iron flows, and is shaped into the well known pig iron as it cools. The steel works were next visited, and the huge Bessemer blast furnaces where the liquid metal is deprived of its carbon, afterwards mixed with the spiegeleisen, and then, as steel, poured into the moulds. It is now rolled out to a length of perhaps eighty or ninety feet, and, after being cut to the proper size, left to cool and consolidate into steel rails. About ten years since, a length of thirty feet was the utmost that could be obtained; now, one hundred and eighty feet is the maximum length to which a rail can be rolled. About five o'clock the company left for Furness Abbey, the interesting features of which were ably described by Mr. J. T. Micklethwaite, F.S.A., the well known authority on monastic buildings, and by Mr. Paley of Lancaster. After tea at the Furness Abbey Hotel, the party returned by special train Lake Side, and thence in Colonel Ridehalgh's yacht to Bowness, arriving shortly after eight p.m.

On *Wednesday*, the day's proceedings began with the Council Meeting at the Bowness Institute, after which the Annual General Meeting was held, the President in the chair.

The Yearly Report and Balance Sheet were read by the Hon. Secretary, the Chairman remarking that the unfavourable financial condition of the Association was largely due to the very inadequate sale of the *Transactions* among the members of the affiliated Societies, only a little over four hundred copies having been taken last year, though there were nearly 1300 Association Members, and intimating that it had been found needful, in consequence, to reduce, for the present, the length of the annual volume from over 200 pp. to 150 pp.

The Reports of the Societies having been taken as read, it was moved and carried that the Report and Balance Sheet of the Association, just read, be adopted. On the motion of the President, seconded by Mr. Healey, (Windermere,) Mr. DAVID AINSWORTH, M.P., was unanimously elected President for the ensuing year. Mr. GOODCHILD and Mr. R. CROWDER were re-elected Editor, and Secretary and Treasurer respectively. The Rev. H. A. MACPHERSON was appointed Zoological Recorder; and the Rev. J. WOOD of Rosley, and Mr. W. HODGSON, Botanical Recorders. The reading of original papers then commenced with one by Mr. Schneider, on "The Hæmatite Iron Mines of Low Furness," read by Mr. Irving, and illustrated by the author by means of a large-scale map. The next paper was one on "The Birds of Cumberland, with Observations on the Birds of Westmorland," by the Rev. H. A. Macpherson and Mr. W. Duckworth. Mr. Postlethwaite of Keswick then read his paper, illustrated by diagrams, on "The Trilobites of the Skiddaw Slates." A paper on "The Phonetic Structure of the Dialects of Cumberland and Westmorland," read by the author, Mr. J. G. Goodchild, F.G.S., concluded the business, several papers having been omitted for want of time. A vote of thanks to Mr. Schneider and the Committee of the Windermere Society, for the hearty way in which they had laboured to make the Meeting a success, was, on the motion of Dr. Troutbeck, seconded by Mr. W. I. R. Crowder, carried unanimously. A similar compliment having been paid to the readers of papers, and a hearty vote of thanks passed to Mr. R. S. Ferguson, for the admirable way in which he had filled the Presidential chair for two years, the company adjourned to luncheon at the Old England Hotel.

At two p.m., the carriage Excursions to Dungeon Gill, Skelwith Bridge, &c.; and also to Kirkstone, *via* Troutbeck, returning through Ambleside, favoured as they were with the finest possible weather, brought the Annual Meeting of the Association to a pleasant conclusion.

R U L E S

OF THE

CUMBERLAND AND WESTMORLAND ASSOCIATION FOR THE ADVANCEMENT OF LITERATURE AND SCIENCE.

1.—That the Association be called the “CUMBERLAND AND WESTMORLAND ASSOCIATION FOR THE ADVANCEMENT OF LITERATURE AND SCIENCE.”

2.—The Association shall consist of the following Societies :—
Whitehaven Scientific Association, Keswick Literary and Scientific Society, Workington Scientific and Literary Society, Maryport Literary and Scientific Society, Longtown Literary and Scientific Society, Carlisle Scientific Society and Field Naturalists' Club, Ambleside and District Literary and Scientific Society, Silloth and Holme Cultram Literary and Scientific Society, Brampton Literary and Scientific Society and Field Naturalists' Club, Penrith and District Literary and Scientific Society, Windermere Literary and Scientific Society; and of such other Societies as shall be duly affiliated. Also of persons nominated by two members of the Council; this latter class of members shall pay the sum of 5s. annually.

3.—All members of affiliated Societies, unless otherwise ruled by the regulations of their respective Societies, shall be members of the Cumberland and Westmorland Association.

4.—The Association shall be governed by a Council, consisting of a President, Vice-Presidents, Secretary, who shall also be Treasurer, an Editor, and of ordinary members, two to be elected by each affiliated Society. The President, Secretary, and Editor shall be elected annually at the Annual Meeting, and shall be capable of re-election.

5.—The Vice-Presidents shall consist of the Presidents of the various affiliated Societies; and the delegates of the various Societies shall be elected annually by their respective Societies.

6.—An Annual Meeting of the Association shall be held at such time and place as may be decided upon at the previous Annual Meeting, or (failing such appointment) as may be arranged by the Council.

7.—At each Annual Meeting, after the delivery of the President's Address, and the reading of the Reports from the affiliated Societies, the objects of the Association may be furthered by Lectures, Papers, Addresses, Discussions, Conversaciones, &c.

8.—The Committee of each affiliated Society shall be entitled to recommend one original and local paper communicated to such Society (subject to the consent of the author) for publication in the *Transactions* of the Association; but Societies contributing capitation grant on a number of members exceeding one hundred and fifty shall have the privilege of sending two papers. The Council shall publish at the expense of the Association the papers recommended, either in full, or such an abstract of each or any of them as the author may prepare or sanction; also those portions of the Association Transactions that may be deemed advisable.

9.—The Council shall endeavour to promote co-operation among

existing Societies, and may assist in the formation of new ones ; it may also aid in the establishment of classes in connection with any of the associated societies.

10.—Affiliated Societies shall contribute annually towards the general funds of the Association, Sixpence for each of their members ; but when the number of members of the affiliated Societies exceeds one hundred and fifty, a reduction of fifty per cent. shall be made upon the payment for each member in excess of that number.

11.—The rules can be altered only by a majority of two-thirds of the members present at an Annual Meeting. Any member desiring to alter the Rules must send a copy of the proposed alterations to the Secretary, at least two weeks before the meeting is held.

12.—Past Presidents of the Association shall be permanent members of the Council, and be described as Past-Presidents.

13.—The travelling expenses of all who assist in carrying out the programme of the various affiliated Societies shall be defrayed by the Society assisted.

The Eleventh ANNUAL MEETING will be held in the Summer of 1886, and due notice of the place of Meeting and of the arrangements will be sent to all members of the Association.

Members willing to contribute original *Articles* on subjects of local interest, or short *Notices* of anything that may be considered worth recording of local and scientific value, should communicate with the Honorary Secretary, ROBERT CROWDER, Esq., Stanwix, Carlisle.

OFFICERS FOR THE SESSION 1885-86.

President :

DAVID AINSWORTH, Esq., M.P.

Past-Presidents.

THE LORD BISHOP OF CARLISLE.

THE LATE I. FLETCHER, Esq., M.P., F.R.S.

THE HON. P. S. WYNDHAM, M.P.

ROBERT FERGUSON, Esq., M.P., F.S.A.

RICHARD S. FERGUSON, Esq., M.A., LL.M., F.S.A.

Vice-Presidents.

J. VIVIAN, Esq., C.E., (Whitehaven.)

Rev. T. N. HOARE, M.A., F.H.S., (Keswick.)

J. B. BAILEY, Esq., (Maryport.)

Rev. J. R. GIBSON, (Longtown.)

Rev. C. H. PAREZ, M.A., (Carlisle.)

Rev. E. M. REYNOLDS, (Ambleside.)

H. L. BARKER, Esq., (Silloth.)

G. J. JOHNSON, Esq., (Brampton.)

Rev. E. W. CHAPMAN, M.A., (Penrith.)

H. W. SCHNEIDER, Esq., (Windermere.)

Delegates.

T. F. P'ANSON, M.D., F.R.H.S., }
A. KITCHIN, F.C.S. } Whitehaven.

A. A. H. KNIGHT, M.D., }
GEORGE BLACK, M.B., } Keswick.

Dr. MATHIAS, }
JOS. CARTMELL, A.M.I.C.E. } Maryport.

Dr. MC LACHLAN, }
WILLIAM JARDINE, } Longtown.

WM. NANSON, M.A., F.S.A., }
HENRY BARNES, M.D., F.R.S.E., } Carlisle.

C. W. SMITH, }
JAMES BENTLEY, } Ambleside.

JOHN GRAHAM, }
W. F. WILSON, } Silloth.

Rev. S. FALLE, }
C. J. RIGG, } Brampton.

Major W. B. ARNISON, }
GEORGE WATSON, } Penrith.

GEORGE HEALEY, }
T. THOMPSON, } Windermere.

Hon. Association Secretary and Treasurer.

ROBERT CROWDER, M.A., Stanwix, Carlisle.

Editor.

J. G. GOODCHILD, F.G.S., F.Z.S., H.M. Geol. Survey, 28 Jermyn-St., London

Zoological Recorder.

Rev. H. A. MACPHERSON, M.A., St. James Road, Carlisle.

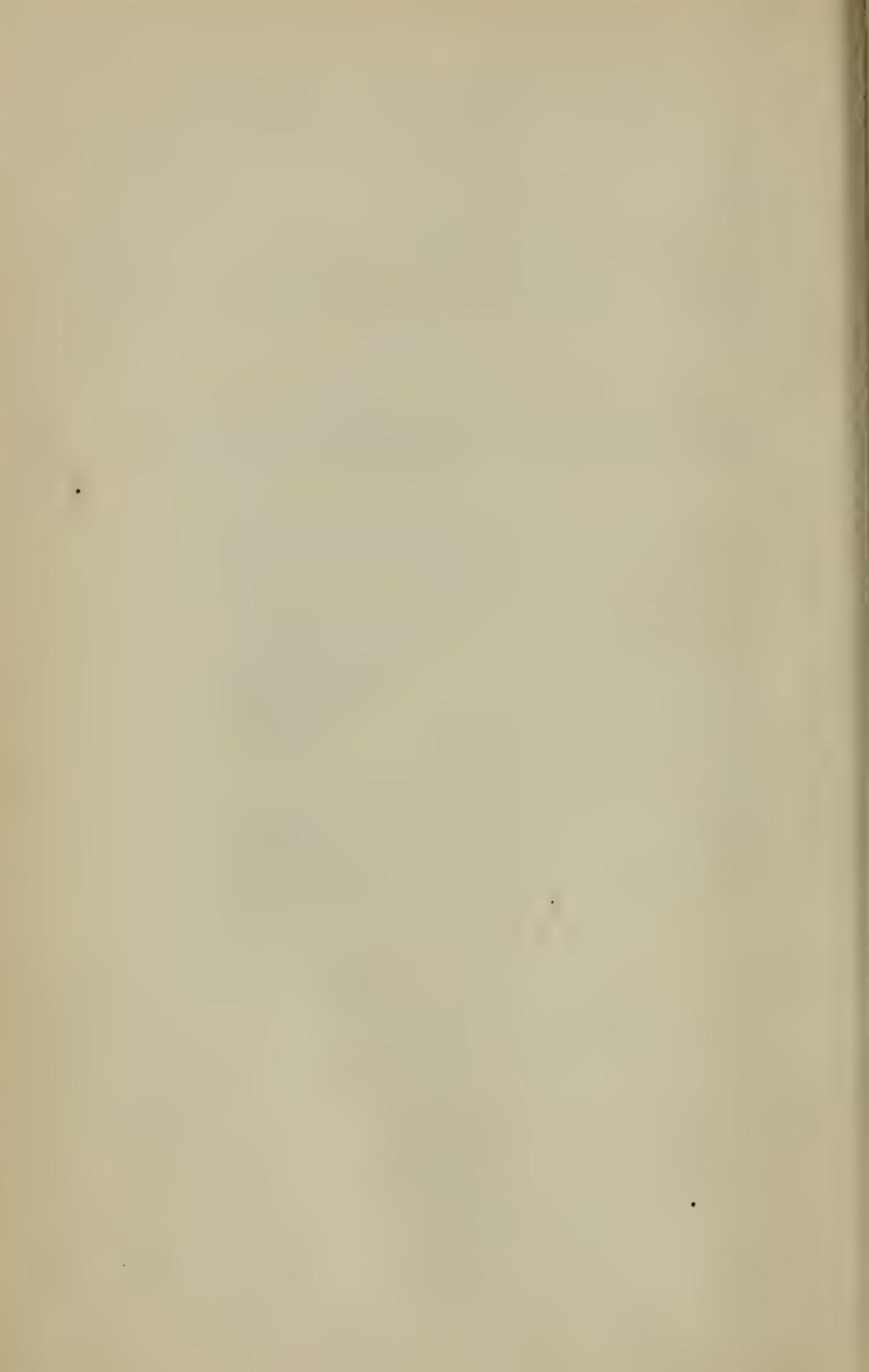
Botanical Recorders.

Rev. R. WOOD, M.A., Rosley Vicarage, Carlisle.

W. HODGSON, A.L.S., Flimby, Maryport.

HON. SECRETARIES OF THE LOCAL SOCIETIES.

Whitehaven	{	W. H. KITCHIN, 27 King Street. E. DOBSON.
Keswick ...	...	T. E. HIGHTON, Brigham, Keswick.
Maryport ...	..	D. IRVING, The Gas Works.
Longtown ...	...	WILLIAM JARDINE, United School.
Carlisle ...	..	JOHN SINCLAIR, 6 Hawick Street.
Ambleside ...	...	JAMES BENTLEY.
Silloth ...	...	JAMES B. BENKS.
Brampton ...	...	C. J. RIGG.
Penrith ...	...	H. M'LEAN WILSON, M.B., C.M.
Windermere	{	Col. W. C. MACDOUGALL. F. BARTON, 8 Biskey Howe Terrace, Bowness.



Reports from the Associated Societies.

WHITEHAVEN SCIENTIFIC ASSOCIATION,

HOWGILL STREET.

18th SESSION, 1884-85.

President J. G. DEES, C.E.

Vice-Presidents.

J. VIVIAN, C.E. | W. Mc.GOWAN.

Past-Presidents.

T. F. I'ANSON, M.D., F.R.H.S.	|	H. A. FLETCHER, F.R.A.S.
W. JACKSON, J.P., F.S.A.	|	JAMES BAIRD.
AUGUSTUS HELDER.	|	R. RUSSELL, C.E., F.G.S.
W. H. KITCHIN.	|	A. KITCHIN, F.C.S.

Committee.

E. ABLETT, M.D.	|	T. JACKSON, M.D.
B. TAYLOR.	|	JOHN NIXON, B.A.
T. GORDON.	|	E. CROMPTON, C.E.

G. SCOLAR, C.E.

<i>Curator of Museum</i> ... ..	...	...	...	W. I'ANSON, M.B.
<i>Curator of Building</i> ... ..	...	...	...	R. PICKERING, C.E.
<i>Treasurer</i> ... ..	...	...	...	J. S. HELLON.
<i>Hon. Librarian</i> ... ..	...	...	...	R. B. GORDON.

Hon. Secretaries.

W. H. KITCHIN. | E. DOBSON.

The following *MEETINGS* were held during the Session :—

- Nov. 4.—CONVERSAZIONE.—ADDRESS BY THE PRESIDENT.
 Nov. 18.—T. F. I'ANSON, M.D.—“Extracts from the Log of the ‘North-umbria.’”
 Dec. 2.—H. M. JAMES.—“Atlantis, the Lost Continent.”
 Dec. 16.—R. PICKERING, C.E.—“The Works of Public Water Supply in West Cumberland.”
 Jan. 6.—W. H. WATSON, F.C.S., F.G.S.—“Modern Thought and Tendency.”
 Jan. 20.—JOHN VIVIAN, C.E.—“Salt and Salt-mining.”
 Feb. 3.—JOHN CRUM.—“Michael Faraday.”
 Feb. 17.—R. RUSSELL, C.E., F.G.S.—“The Soils of Cumberland in relation to Agriculture.”
 Mar. 3.—R. HELLON, Ph.D., F.C.S.—“The Life and Chemical Work of Adolphe Wurtz.”
 Mar. 17.—JOSEPH HUGHES.—“Steam Boilers.”
 Mar. 31.—W. I'ANSON, M.B.—“Bacteria.”
 Apr. 14.—A. KITCHIN, F.C.S.—“Coal Gas.”
 Apr. 28.—Business Meeting, Election of Officers, &c.

KESWICK LITERARY AND SCIENTIFIC SOCIETY.

16th SESSION, 1884-85.

<i>President</i>	...	...	...	...	REV. W. COLVILLE.
<i>Vice-President</i>	...	...	...	...	REV. J. N. HOARE, M.A.
<i>Secretary</i>	...	...	...	...	MR. T. E. HIGHTON.
<i>Treasurer</i>	...	...	...	...	MR. EDWIN JACKSON.

Committee.

REV. H. D. RAWNSLEY, M.A.	|	J. POSTLETHWAITE, F.G.S.
GEORGE BLACK, M.B.	|	WM. WOOD.
J. FISHER CROSTHWAITE, F.S.A.		G. H. DIXON, B.A.

Hon. Curators of the Museum.

A. A. H. KNIGHT, M.D.		JOHN BIRKETT.
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LECTURES.

1884.

Nov. 3.—REV. J. TAYLOR, M.A.—“Erasmus of Rotterdam.”

Nov. 24.—REV. J. T. POLLOCK, M.A.—“Elocution.”

Dec. 8.—J. R. ANDERSON, ESQ.—“The Crusades.”

1885.

Feb. 2.—W. ROUTH FITZPATRICK, ESQ.—“Schiller: German Dramatist,
Poet, and Historian.”

Feb. 16.—DR. G. BLACK.—“Dr. John Brown, of Edinburgh.”

Mar. 2.—REV. J. N. HOARE, F.H.S.—“Early Christianity in North-
umbria.”

Mar. 9.—J. G. GOODCHILD, ESQ., F.G.S.—“The Lion and its Kin.”

Mar. 23.—REV. T. W. NORWOOD, M.A.—“Gipsies.”

ORDINARY MEETINGS.

1884.

Oct. 27.—PRESIDENT'S ADDRESS.

Nov. 17.—REV. J. SHARPE OSTLE, B.A.—“Thackeray.”

Dec. 1.—DR. A. A. H. KNIGHT.—“The Weather.”

Dec. 15.—REV. H. D. RAWNSLEY, M.A.—“Some Reminiscences of Word-
worth among the Peasantry of Lakeland.”

1885.

Jan. 26.—MR. G. H. DIXON, B.A.—“The Legal Position of Married Women
in ancient and Modern Times.”

Feb. 9.—REV. H. WHITEHEAD, M.A.—“George Fox.”

Feb. 23.—MR. G. E. LOWTHIAN.—“Fire,” (illustrated by experiments.)

Mar. 16.—MR. J. F. CROSTHWAITE, F.S.A.—“Some of the Old Families
in the Parish of Crosthwaite.”Mar. 30.—ANNUAL MEETING.—MR. T. E. HIGHTON.—“Progress of the
Rise of Power in the People in the 19th Century.”

MARYPORT LITERARY AND SCIENTIFIC SOCIETY,
ASSEMBLY HALL, HIGH STREET.

9th SESSION, 1884-85.

President J. HEWETSON.
Vice-President J. B. BAILEY.

Past-Presidents.

J. CARTMELL, A.M.I.C.E. | W. HINE. | DR. W. B. MATHIAS.

Committee.

REV. J. S. CRAIG.	|	MR. A. HINE.
REV. W. P. SCHAFFTER.	|	MR. F. WALKER.
MR. J. ROSS.	|	MR. J. WILLIAMSON.
MR. P. B. MELMORE.	|	MR. R. H. HAMILTON.
MR. G. M. TICKLE.	|	MR. C. EAGLESFIELD.

Delegates.

DR. MATHIAS. | MR. J. CARTMELL.

Hon. Secretary and Treasurer MR. D. IRVING.

The following MEETINGS were held during the Session:—

1884.

- Oct. 28.—MR. J. B. BAILEY.—“The Order of St. John of Jerusalem.”
Nov. 13.—MR. FRANK CURZON.—“Our Faces, and how we came by them.”
(Black Board Lecture.)
Nov. 25.—MR. C. EAGLESFIELD.—“Classical Architecture.”
Dec. 9.—MR. J. B. MASON.—“Chess.”

1885.

- Jan. 13.—MR. J. NEWBY HETHERINGTON, F.R.G.S.—“The Revolutionary Element in English Poetry, or Poetry and Politics from 1785 to 1832.”
Jan. 27.—MR. R. H. HAMILTON.—“Ferns.”
Feb. 10.—REV. J. I. CUMMINS.—“St. Patrick a Cumbrian.”
Feb. 24.—REV. C. B. S. GILLINGS.—“Sir W. Scott in Cumberland.”
Mar. 10.—MR. PATTINSON B. MELMORE.—“Electricity.”
Mar. 24.—MR. J. G. GOODCHILD, F.G.S.—“The Lion and its Kin.”
Apr. 4.—Election of Officers, &c.

LONGTOWN LITERARY AND SCIENTIFIC SOCIETY.

8th SESSION, 1884-85.

President REV. J. R. GIBSON.

Vice-Presidents.

R. A. ALLISON, ESQ., M.A.	|	MR. S. F. MC.LACHLAN, M.B.
REV. P. CARRUTHERS.	|	WM. EASTON ROBERTSON, ESQ.

Treasurer and Secretary... .. MR. JOHN WILSON.

Committee.

MR. I. RIGG.	|	REV. WM. LYTTEIL.
MR. WM. LITTLE.	|	MR. A. TWEDDLE.
MR. A. P. WILKIE.	|	MR. WM. KILGOUR.

MEETINGS.

1884.

- Nov. 4.—REV. J. R. GIBSON, President of the Society.—“Words, their use and abuse.”
- Nov. 10.—MR. POWELL THOMAS.—Elocutionary and Musical Entertainment. (Special Meeting.)
- Nov. 18.—REV. JOS. WALLACE, M.A.—“The Use and Abuse of Tobacco.”
- Nov. 25.—REV. DR. GRANT.—“The Association of Ideas.”
- Dec. 2.—Debate: “Are the works of Charles Dickens elevating in character?”
- Dec. 9.—REV. GEORGE LAMBERT.—“The Pilgrim Fathers.”
- Dec. 16.—Readings: “A Night with Byron.”
- Dec. 23.—S. F. MC.LACHLAN, M.B.—“Oliver Goldsmith.”
- Dec. 30.—MR. WM. JARDINE.—“An Hour with Mark Twain.”

1885.

- Jan. 6.—A Musical Evening.
- Jan. 13.—MR. JOHN WILSON.—“Fallacies in Common Proverbs.”
- Jan. 20.—JOS. HEPWORTH, ESQ.—“Coal Tar Colours.”
- Jan. 27.—MR. R. NIXON.—“Epictetus.”
- Feb. 3.—Debate: “Is the present system of Examinations and Grants in Schools beneficial to the Scholars?”

- Feb. 10.—REV. WILLIAM LYTTEIL, M.A.—“John Duncan, Weaver and Botanist.”
- Feb. 17.—REV. GEORGE DAVIES.—“What is Freemasonry?”
- Feb. 24.—REV. C. J. SENIOR.—“What I Saw and Heard at the International Temperance Congress at Brussels.”
- Mar. 3.—Readings from different Authors.
- Mar. 10.—HUGH MILLER, ESQ., F.G.S.—“The History of a Liddesdale Stone.”
- Mar. 17.—REV. J. R. GIBSON.—“The Sun.”
- Mar. 24.—REV. P. CARRUTHERS.—A Paper on Sir Walter Scott.
- Apr. 7.—Business of the Society, Election of Officers, &c.

CARLISLE SCIENTIFIC SOCIETY AND FIELD
NATURALISTS' CLUB.

8th SESSION, 1884-85.

President R. S. FERGUSON, ESQ., M.A., F.S.A., LL.M.

Past-Presidents.

THE RIGHT REV. THE LORD BISHOP OF CARLISLE.

ROBERT FERGUSON, ESQ., M.P.

MILES MACINNES, ESQ.

Vice-Presidents.

S. J. BINNING, ESQ.

REV. C. H. PAREZ, M.A.

Treasurer WM. NANSON, ESQ., B.A., F.S.A.

Hon. Secretary JOHN SINCLAIR, 6 Hawick Street.

Committee.

MR. R. J. BAILLIE.

DR. MACLAREN.

DR. CARLYLE.

DR. BARNES.

MR. T. DUCKWORTH.

MR. W. DUCKWORTH.

MR. R. M. HILL.

MR. ISAAC CARTMELL.

MR. GEO. DAWSON.

MR. J. A. WHEATLEY.

MR. ROBT. CROWDER.

MR. W. B. DODD.

During the Session the following Lectures have been delivered:—

PUBLIC LECTURES.

1884.

- Nov. 4.—R. A. ALLISON, ESQ.—“The Making of the English Language.”
 Dec. 2.—REV. H. A. MACPHERSON.—“The Birds around Carlisle.”

1885.

- Jan. 6.—WM. NANSON, ESQ., B.A., F.S.A.—“Porcelain.”
 Feb. 3.—R. S. FERGUSON, ESQ., M.A., F.S.A., LL.M.—“The Beaumont Hoard.”
 Mar. 3.—J. G. GOODCHILD, ESQ., F.G.S.—“The Lion and its Kindred.”

ORDINARY MEETINGS.

1884.

- Nov. 20.—MR. W. DUCKWORTH.—“Wild Flowers around Carlisle.” Part 2.
 Dec. 18.—MR. W. HODGSON.—“The Hill Naturalist.” Part 2.

1885.

- Jan. 22.—DR. CARLYLE.—“Fungi.”
 Feb. 19.—MR. T. DUCKWORTH.—“Summer Visitors.” Part 2.
 Mar. 19.—MR. GEORGE DAWSON.—“Local Entomology.” Part 6.
 Apr. 23.—MR. JOHN SINCLAIR.—“Insects mentioned in Shakespeare.”

AMBLESIDE AND DISTRICT LITERARY AND
 SCIENTIFIC SOCIETY.

8TH SESSION, 1884-85.

President REV. E. M. REYNOLDS.

Vice-Presidents.

F. M. T. JONES, ESQ. | G. GATEY, ESQ.

Past-Presidents.

R. CREWDSON, ESQ. | REV. H. S. CALLENDER.

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LECTURES, PAPERS, &c.

1884.

- Oct. 31.—REV. E. M. REYNOLDS, M.A., PRESIDENT.—Debate: "That it does not appear that the advantages of the proposed Railway to Ambleside will outweigh the disadvantages."
- Nov. 11.—DR. J. E. TAYLOR, F.L.S., F.G.S.—"Flowers and Fruit, and their relation to Insects and Birds."
- Nov. 28.—MISS MARY BASKIN, (Author of "Into Smooth Waters," "Released," &c.)—Readings and Recitals.
- Dec. 12.—W. E. CHURCH, ESQ.—"Punch, or the London Charivari, of to-day."

1885.

- Jan. 9.—W. G. COLLINGWOOD, ESQ., M.A.—"The Lake Basins of the Neighbourhood; a new Examination of their Structure."
- Jan. 23.—WAYNMAN DIXON, ESQ., C.E.—"The History and Work of the Order of St. John of Jerusalem."
- Feb. 6.—REV. C. W. RAWSON, M.A.—"The Life of Mahomet."
- Feb. 25.—J. G. GOODCHILD, ESQ., F.G.S.—"The Lion and its Kin."
- Mar. 6.—H. MARSHALL WARD, ESQ., M.A., of Owen's College, Manchester.—"Green Leaves."
- Mar. 20.—GEORGE GATEY, ESQ., V.P.—"How Customary Tenure was established in Westmorland."

SILLOTH AND HOLME CULTRAM LITERARY AND
SCIENTIFIC SOCIETY.

6TH SESSION, 1884-85.

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LECTURES AND MEETINGS.

1884.

Oct. 15.—R. J. BAILLIE, F.R.A.S.—“Meteors and Comets.”

Oct. 29.—REV. J. T. POLLOCK, M.A.—“Elocution.”

Nov. 12.—W. H. HOODLESS.—“The Home of Shakespeare,” with Illustrations.

Nov. 27.—MISS MARY BASKIN.—Miscellaneous selections from American and English Authors.”

Dec. 10.—ROBERT FERGUSON, ESQ., M.P.—“Snakes and Snake Worship.”

Dec. 19.—Readings by several Members.

1885.

Jan. 7.—J. NEWBY HETHERINGTON, F.R.G.S.—“Charles Dickens as a Novelist.”

Jan. 21.—JAMES THOMSON.—“The Succession of Life on the Earth.”

Feb. 5.—REV. C. B. S. GILLINGS.—“Sir Walter Scott in Cumberland.”

Feb. 19.—REV. S. HEBERT, M.A.—“An Evening with the Stars,” with Magic Lantern Illustrations.

Mar. 4.—J. G. GOODCHILD, F.G.S., H.M. Geological Survey.—“The Lion and its Kin.”

Mar. 11.—HUGH MILLER, F.G.S., H.M. Geological Survey.—“Raised Sea Beaches and old Sea Bottoms.”

Mar. 26.—ROBERT HORNSBY.—“Agriculture.”

BRAMPTON LITERARY AND FIELD NATURALISTS'
SOCIETY.

SESSION 1884-85.

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MISS BELL.

MISS MC.QUEEN.

MISS THOM.

The following Meetings were held during the Session:—

1884.

Oct. 14.—REV. S. FALLE.—“Jersey to Normandy,” Illustrated.

Oct. 21.—MR. VALLANCE, Elocutionist.—Literary Entertainment.

Nov. 4.—DR. H. Y. THOMPSON,—“Electricity and Electric Lighting,”
Illustrated by Apparatus and Experiments.

Nov. 18.—MEMBERS.—Shakespearian Reading, “Midsummer Night’s
Dream.”

Dec. 2.—DR. WOTHERSPOON.—“A Geological Epoch.”

Dec. 16.—MR. T. RIDLEY.—Debate.

1885.

Jan. 20.—CONVERSAZIONE.

Jan. 27.—J. THOMPSON, ESQ.—“Electricity.”—Annual Business Meeting.

Feb. 10.—REV. H. J. BULKELEY.—“Eminent Persons who died in 1884.”

Feb. 24.—A. M. SMITH, ESQ.—“Shakespearian Portraits.”

Mar. 17.—MR. H. JACKSON.—Debate—“Poor Law Reform.”

PENRITH AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

4TH SESSION, 1884-85.

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Delegates.

MAJOR W. B. ARNISON. | MR. GEORGE WATSON.

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FRANCIS KING.
G. V. SMITH.
J. S. YEATES.

Hon. Curator of Museum CHARLES SMITH.
Librarian J. STUART.

The following was the Programme for the Winter :—

1884.

Nov. 13.—CONVERSAZIONE AND EXHIBITION of various Objects of Interest.
 PRESIDENT'S ADDRESS and Election of Office-bearers.

Nov. 20.—REV. C. H. GEM.—“Tennyson.”

Nov. 27.—J. G. GOODCHILD, ESQ.—“Penrith Dialect.” Part 1.

Dec. 11.—C. H. HIGGINS, M.D.—“Hamlet.”

Dec. 16.—GEORGE WATSON, ESQ.—“Cécely Neville, and the Feudal Lords
 of Penrith.”

Dec. 30.—PROF. H. A. NICHOLSON.—“Our Domestic Animals.”

1885.

Jan. 15.—J. N. HETHERINGTON, ESQ.—“Novelists of the 18th Century.”

Jan. 22.—Readings from Novelists of the 18th Century.

Feb. 3.—M. W. TAYLOR, M.D.—“A Tour in Canada.”

Feb. 10.—J. P. SOUTER, ESQ.—“Botany.”

Feb. 24.— Do. do.

Feb. 28.—J. G. GOODCHILD, ESQ.—“Penrith Dialect.” Part 2.

Mar. 2.—J. G. GOODCHILD, ESQ.—“The Lion and its Kin.”

WINDERMERE LITERARY AND SCIENTIFIC
 SOCIETY.

3RD SESSION, 1884-85.

President H. W. SCHNEIDER.

Vice-Presidents.

E. P. STOCK. | GEO. HEALEY.

Secretaries.

W. C. MACDOUGALL. | F. BARTON.

Treasurer JOHN HOLLAND.

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R. GLEGG.	T. THOMPSON.
F. CLOWES.	W. V. YATES.
H. CROSSLEY.	GEORGE HEALEY.
T. DOBSON.	W. E. BOND.
R. MORGAN.	JAMES BELL.

Eight Public Lectures and two Members' Meetings have been held during the Session, as follows:—

DR. J. E. TAYLOR.—“Dust.”

MR. A. KITCHIN.—“Some of the Phenomena of Light.”

MEMBERS' MEETING.—Debate, opened by MR. B. A. IRVING, on “Constitutional Government.”

MR. MARTINDALE.—“Lichens.”

DR. W. CLARKE ROBINSON.—“Northern Mythology.”

MEMBERS' MEETING.—REV. L. R. AYRE.—“A Study of Coins.”

J. W. BALLANTYNE, M.B.—“On Healthy Homes.”

MR. B. A. IRVING.—“The Jordan Valley.”

DR. CLOWES.—“Fire—Friend and Foe.”

MR. BOND.—“Concert Lecture.”



Report of the Association Secretary

FOR THE YEAR 1884-5.

THE past year has, on the whole, been of a satisfactory character. The number of affiliated Societies is ten, being the same as last year; but the number of Members on whom the capitation grant has been paid is slightly in excess of the previous year, being 1268, or an increase of 74. The number of Association Members is 22.

It is again a matter for regret to observe that the *Transactions* of the Association do not as yet receive the recognition that the generally high standard of their contents should ensure for them. With a Membership of 1268, only 416 copies have been taken by the affiliated Societies during the year, and in the case of four Societies, the *Transactions* are either wholly or partially presented to their Members. Considering the extremely low price of 1/- for a publication of over 200 pp., it does indeed seem surprising that such should be the case; and it will now be a question for the Council to consider whether, under these circumstances, it will be possible to expend so large a portion of the Association funds in this publication, in face of an increasingly adverse balance.

Society	No. of Members on whom Grant is paid.	Copies taken of No. IX.	Terms
Whitehaven ...	302 ...	80	Free to Associate Members
Keswick ...	149 ...	40	To Members at 1/-
Maryport ...	88 ...	60	Free to Gentlemen; Ladies, 1/-
Longtown ...	47 ...	3	To Members at 1/-
Carlisle ...	152 ...	120	To Members Free
Ambleside ...	110 ...	25	To Members at 1/-
Silloth ...	63 ...	20	To Members at 1/-
Brampton ...	76 ...	9	To Members at 1/-
Penrith ...	165 ...	50	To Family Ticket-holders, Free
Windermere ...	116 ...	9	Members at 1/-
Assoc. Members	22 ...	22	At 1/-
Total	<u>1290</u>	<u>438</u>	

Cumberland and Westmorland Association for the Advancement of Literature and Science.

BALANCE SHEET FOR YEAR ENDING APRIL 30, 1885.

RECEIPTS.	PAYMENTS.
Balance brought forward £38 6 6	Fee to Lecturer at Annual Meeting (Penrith) £12 8 0
Subscriptions in Arrears ... 0 10 0	Expenses of Annual Meeting 3 12 6
<i>Transactions</i> (No. VIII.) Sold 0 8 0	Editor's Postage Account... 0 15 0
Authors' Copies Sold ... 2 10 3	Printing <i>Trans.</i> Part VIII. 48 2 0
Back Numbers Sold ... 1 0 0	Authors' Copies ... 3 11 9
Capitation Grant (1884-5) on 1116 Members ... 25 16 3	Postage of <i>Transactions</i> ... 0 6 6
Subs. of 18 Assoc. Members 4 10 0	Circulars, Stationery, &c... 1 10 4
<i>Transactions</i> Sold, No. IX. To Soc. (284) £14 4 0	Sundries ... 0 8 0
,, Assoc. Mem. 0 18 0	Balance in hand ... 23 15 1
,, Authors' Cops. 3 10 2	
,, Back Nos. 0 18 6	
19 10 8	
Editor towards cost of his paper on Minerals ... 1 10 0	
Bank Interest ... 0 7 6	
£94 9 2	£94 9 2

Examined and found correct, 10th July, 1885,

WM. NANSON. }
HENRY BARNES, } *Auditors.*

ASSETS.	LIABILITIES.
Balance brought down £23 15 1	Messrs. Coward for Printing
Grant from Society ... 3 15 6	<i>Transactions</i> No. IX. £52 15 9
Subscriptions (1883-4) ... 0 12 0	Cost of Authors' Copies ... 5 1 11
Do. (1884-5) ... 0 12 0	Postage of <i>Transactions</i> ... 0 10 8
<i>Transactions</i> , No. IX. To Societies (129 copies) 6 9 0	Secretary's Postage Account 0 17 0
Back Numbers ... 0 10 0	Circulars, Stationery, &c... 1 14 5
Estimated Balance due to Treasurer ... 26 10 4	Sundries ... 1 4 2
£62 3 11	£62 3 11

TRANSACTIONS, PART IX.

Sold to Societies	416
Sold to Association Members	22
Presented	19
Sold	2
On hand (June 19, 1885)	291

Total 750 copies

LIST OF PUBLICATIONS OF SOCIETIES
RECEIVED BY THE ASSOCIATION IN EXCHANGE
FOR THE *TRANSACTIONS*.

- 1 United States Geological Survey Annual Reports for 1880-81,
and for 1881-82-
- 2 Transactions of Yorkshire Naturalists' Union, 7 Parts (for 1882).
- 3 Transactions of Essex Field Club, 1883-84.
- 4 Transactions of Bristol Naturalists' Society, 1882-83, & 1883-84.
- 5 Transactions of Burnley Literary and Scientific Club for 1883
and 1884.
- 6 Transactions of Berwickshire Naturalists' Club, 1882-83-84.
- 7 Transactions of the Midland Union of Natural History Societies
for 1881-82-83-84, and part of 1885.
- 8 The Proceedings of the London Geological Society for 1882,
1883-84-85.
- 9 Transactions of the Birmingham Natural History and Micro-
scopical Society, 1883-84.

ON LAKE-BASINS OF THE NEIGHBOURHOOD OF WINDERMERE.

(The substance of a Lecture given before the Literary and Scientific Society
of Ambleside, January 9th, 1885,)

By W. G. COLLINGWOOD, M.A.

1. *Problem of the Conditions of Basin-formation.* After learning all one can from accessible manuals and magazines, there still remains a perplexity involving the origin of Lake-basins. It may be that the authorities, to whom we owe unparalleled opportunities for understanding the physical history of our country, are reserving the explanation of these, as of other difficulties. But meanwhile, one asks, "Can any rule or reason be alleged, as fixing the positions and proportions of Lake-basins? What gave such and such a lake its site, and its size?"

Suppose we climbed the hills near Bowness, and as we looked up and down Windermere were informed—"Once there was a time when all this ten-mile-long basin was not excavated. Before the great Ice Age the land lay flat, or nearly so,—a plateau swept bare by the breakers of the sea. Then came glaciers, sliding down from the higher parts, shod with sharp stones; grinding and grooving the earth so powerfully and so persistently that they hollowed out Windermere." To which the learner might answer,— "And was all the lower end of Windermere filled up to the brim with rock, before the glacier came?" "No doubt." "Then why did not the glacier carve its channel down Winster-way, instead of curving round to Newby Bridge? There was nothing to prevent it, and it would have taken a straighter course too. And why is yonder little tarn perched just where it is—so awkwardly on a broken hillside? and why are these peat-mosses,—which of course are real lake-basins, though small and choked with peat,—why are

they just in the places where they are?" The reply might be—"Glaciers excavate more rapidly in the softer material, and in lines where the ground has been broken by faults." "But," we should urge, "here is no question of harder and softer; and as to faults, no fault marks out the course of Windermere. Can you tell what planned and directed the excavation of these basins? For an etcher would never say that it was aquafortis that made the lines of his picture: left to itself, the acid would bite the whole surface to uniform blackness; as the glacier (if such are its powers) would grind the whole surface to uniform smoothness, unless its flow were directed and its force emphasized by some previous—and, for our answer, more important—operation. What iron pen drew in the rock the outlines for this mighty landscape of Nature's *Liber Studiorum*?"

2. *Minor Basins, anticlinal.* The hills we spoke of, to south of Bowness-on-Windermere, are of Bannisdale Slate, which shews especially-visible—though monotonous—bedding. So that we have no difficulty in ascertaining the structure of any small area; though the sameness of the strata, together with their bewildering contortion and undulation, makes it difficult, if not impossible, to map the structure of the whole formation. Examining the tiny peat-basins and small tarns, we find that they are none of them cut or carved out of simple continuous beds. Wherever there is a basin, there is a break. Such breaks are not usually faults. The structures in which they are found may be described as eddies in stone, occurring at the intersection of crossing waves; anticlinals rounding themselves into domes; synclinals curling themselves into cups. The completeness of dome or of cup seems to have been often marred by some want of continuity of effort; the synclinal cup has one side open, the anticlinal dome is not often truly quaquaversal: and, beside that, the rock is exceptionally shattered and denuded at these points.

To take one of many instances, the sketch (Fig. 1) shows how clean the continuity of bend may be: for the beds, B B, run round unbroken in this instance in a sharp curve of more than a quarter of a circle: proving it impossible that this structure, so intimately



Fig. 1.

connected with the creation of the basins described below (see Fig. 3), could have been produced by glacial disturbance of great loose blocks, or by any action except such as created that undulation and contortion of bed which characterises this, or any other, mountain-district. In this particular anticlinal dome no basin, worthy of the name, exists; the scale, as shewn by the figure carrying sticks, being extremely small; which makes the instance more striking as an example of the finesse of Nature's rock-modelling. Magnify this example some hundreds of diameters, and you increase the little rock-pool among the furze into a fair-sized tarn. In our neighbourhood I have not as yet seen many examples of the kind; and such as exist need no farther illustration.

3. *Minor Basins, syndinal.* Simple syndinal structures in which peat-mosses lie are common: and the position of the basin

is generally as shewn in Fig. 2, which gives five small basins and the rocks surrounding them, and diagrammatically suggests their converging dip. Rowan-tree Hill, three miles south of Bowness, on which they stand, is built of steeply-sloping slate-beds, for the most part following the undulations of parallel earth-waves, running—as most of

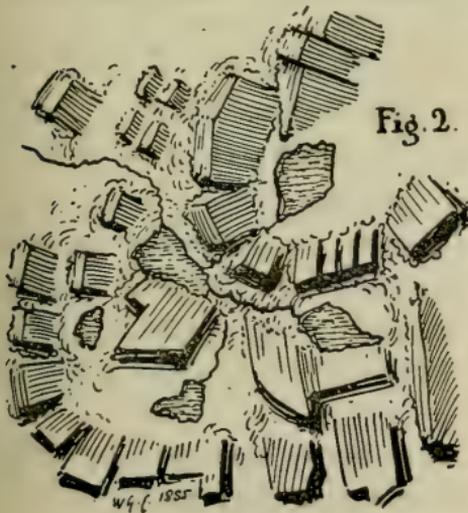


Fig. 2.

the evident earth-waves of the district do—roughly ENE. and WSW. Across these a line of disturbance cuts, and at this point throws the outcropping beds into a form resembling a theatre, or a pile of cups one within another; in each circle of which, broken and dislocated, lie the basins. Among many such cases, an accessible and striking one occurs in the Coniston Series (this of Rowan-tree Hill is in the Bannisdale Slate) at the angle between the road from Ambleside to High Cross, and that leading from it, near High Cross, to the Tarns.

4. *Compound Basins.* A great number are not very perfect in this theatral configuration; occurring just at the clash of cross-waves in their most marked intensity. It is no exaggeration to

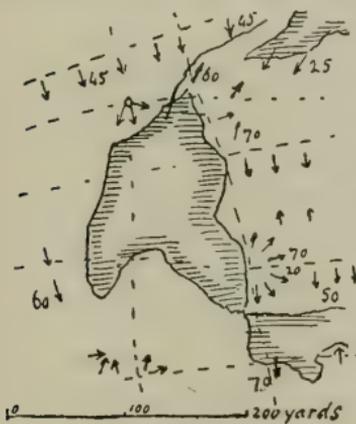


Fig. 3.

say that there are scores of such, from a dozen yards to some hundreds of yards in diameter. A complicated example of this kind is given in the map (Fig. 3), which shews Great Candlestick Moss with parts of two other basins, situated not far from the spot shewn in Fig. 2, and containing the anticlinal dome sketched in Fig. 1, which is here marked by a small circle. The arrows denote observed dips; the

broken lines, anticlinal axes, as well as I can make them out from the bedding and from the other indications of structure, such as the strike of ridges, which, in this country, generally indicate the strike of earth-waves. It will be seen that the depression lies irregularly at the intersection of a steep synclinal axis with other synclinal axes. In Fig. 2, one semicircular synclinal produced several basins: in Fig. 3 one basin is formed out of the union of several synclinal pits.

In the Volcanic Series of Borrowdale we have less opportunity for ascertaining structure on a small scale, owing to the massiveness

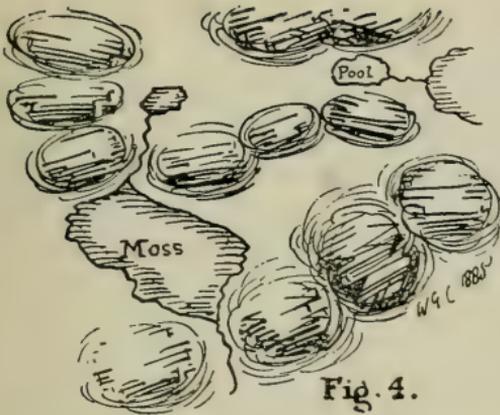


Fig. 4.

of the strata. But the character of the moorlands of this formation resembles that of the Upper Silurians in the hilly nature of the ground. Fig. 4 shews a space of such hillocks on Loughrigg Fell, with the strike of the slaty cleavage, which slightly

varies in each separate block; suggesting that it was by the disruption of these, in some such earth-movement as bent the more pliable Upper Silurian strata, that the ground between them was prepared for the formation of basins.

5. *Analogy of Structure in the Alps.* By the study of these earth-waves on a large scale in the Alps, especially in the Cretaceous

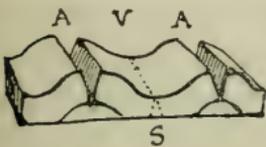


Fig. 5.

Alps of Savoy, one learns that as a rule their attendant circumstances are such as

Figs. 5 and 6 exhibit.

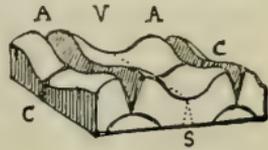


Fig. 6.

Fig. 5 shows the usual break along the crests of the anticlines AA, creating longitudinal valleys, called in Savoy "combes." The alternating valleys, V, are called "vallons." It may be argued that, if the top of the wave bursts along and forms a combe, the under side of it may tend to break along the bottom of a vallon at S. And in fact the great faults of Savoy indicate that some such weak lines do occur along the vallons—not that every synclinal is broken throughout, as not every anticlinal bursts along its whole length; but the tendency and general practice is undoubtedly toward solution of continuity under those circumstances.

But neither Savoy nor any other real mountain-district is ridged in simple horizontal waves—mere extensions of Fig. 5. There

is a cross-current, so to speak, which ruffles them, though not violently, till they assume the structure of Fig. 6. Here, from C to C, is formed a cross-valley; and not only that, but invariably a break in the rock, generally accompanied with vertical faulting and lateral dislocation; which in these Alps must be distinguished, at least in results, from one another. The gorge created where the anticlinal axes are cut by the cross synclinal axis is called a "cluse," *the Cluse of Savoy* being well known on the road from Geneva to Chamonix. The point where the synclinal axes cut one another is invariably the position of either a basin, or an alluvial flat which must anciently have been a lake; examples of this are the Lake of Annecy, lying in a series of such basins; and the flats of Sallenches and Chambéry.

6. *Structural relations of Windermere.* Do these facts, taken in conjunction with our observations on the small basins of our moors, throw any light on the origin of Windermere? We know that the mountains of the Lake District are created by a system of undulations, greater than those on the surface of the Upper Silurians, though less than those of the Alps; yet in structure and origin, similar. Our district is ridged across on axes running ENE. and WSW.; the great Volcanic formations and Skiddaw Slates are bent into enormous arches, whose billowy swell bears on its back the multitudinous ripples of the Upper Silurians. These great billows, like the little surface-waves, are crossed by counter-currents, creating broad transverse undulations. Through the district, from North to South, runs the synclinal axis of this counter-undulation, whose anticlinals thrust up the Skiddaw Slate to West and East of us, at Black Combe and near Shap.

Fig. 7 is a diagrammatical view of the structure of the southern part of the district, seen from the south. The formations are lettered—S, Skiddaw Slate; V, Volcanic Series of Borrowdale; F, Coniston Flags and Grits; B, Bannisdale Slates; and DD represent the dykes which traverse the strata and shew that our seven-mile flooring is not flawless. The Topography:—M, Coniston Old Man, beyond which the Valley of Wrynose and Little Lang-

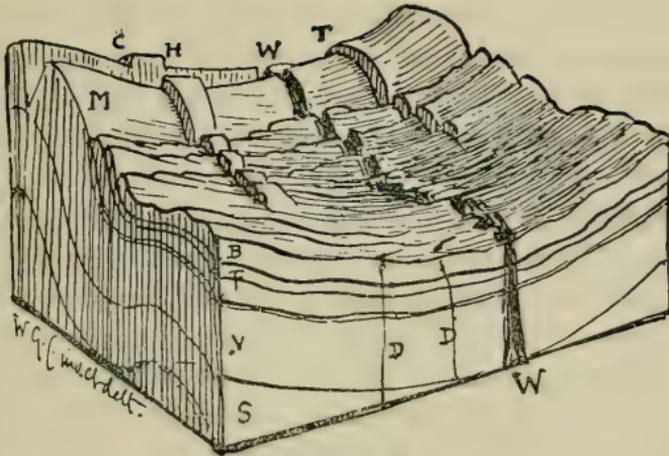


Fig. 7.

dale may possibly represent the "combe" or longitudinal break of the southern great Cumbrian anticlinal; answering to the Keswick valley in the north. C is the great Coniston fault; H, the Hawkshead fault, throwing down in an opposite direction; and T is the Troutbeck fault. Windermere lies in the line WW; a position analogous to the line CC of Fig. 6—the "cluse" of the Alps. Its structural relations are identical with those of the Lake of Annecy on the one hand, and with those of Candlestick Moss (Fig. 3) on the other. Windermere lies in the hollow, or series of hollows, conditioned primarily by the rupture of synclinal pits, where the synclinal axes of crossing undulations cut one another.

7. *Laws conditioning the Origin of Basins.* This then, I would suggest, may afford us a rule for the conditions of origin of Lake-basins, in those cases where they are not coincident with faults. In a great number of cases, and those ranging over great differences of dimension, Lake-basins lie at the intersection of synclinal axes.

To this rule we might add two corollaries, First, that the size of the Lake-basin is proportioned to the breadth of the waves. Second, that the frequency of Lake-basins is proportioned to the number of such intersections; every intersection not necessarily creating a basin, but affording the possibility of one; while every so-called Lake-basin may consist of two or more "deeps," or true

basins, combined. From this we see how some districts, in spite of glaciation, do not exhibit lakes; because their strata, unlike the ancient formation of our Lake District, of Wales, Ireland, Scotland, and the Alps, have not been crossed and recrossed by axes of elevation.

But, after all that has been said, why does Windermere not run in a straight line? Because the earth-waves are not straight. You see that in a glance, for example, at the map of the Alps, whose axes run northward from the Gulf of Genoa to the Lake of Geneva, and then turn eastward; the Lake of Geneva itself starting from the "cluse," greatest of all such cluses, at the corner where the turn is taken. In the same way, the broad transverse waves which cross the narrower—but steeper—ENE. and WSW. ridges of the Lake District appear to present a concavity to the West, parallel with the main direction of the Pennine Fault, and marked by the multitude of minor faults which break up the district in lines running NNW. and SSW.

8. *Basins in Faults.* The Lake-basins of our neighbourhood, which do not lie in anticlinal or synclinal breaks, coincide with faults in the direction just described. The East-and-West faults do not usually influence the modelling of the Lake District; they are parallel with the Pendle Anticlinal, and were created (according to Mr. Clifton Ward's "Physical History of the English Lake District,") at the same epoch; that is, before or during the Post-Carboniferous elevation and denudation which raised this district from the sea as a plateau whose general height was some few hundred feet only above the present summits. It was ages after this, that, in Post-Permian times, the Pennine axes were formed, with their corresponding NNW. and SSW. faults, which shift the older faults, and which are coincident with numerous valleys and more numerous basins. On the Coniston Old Man nearly all the peat-mosses, as well as most of the other physical features, seem to have been determined by these later faults. Their effect in breaking up a plateau of denudation must have been, in the first place, enormous;—the downthrow of several exceeding half a mile. In the second place,

those effects must have been more or less permanent ; because the district was never again subjected to the marine denudation which alone could wholly obliterate them : its only subsequent submergence was partial,—at the glacial epoch ; and the glacial agencies themselves are commonly understood rather to have emphasized than destroyed the pre-existing surface-sculpture. It was these Pennine faults which shared with the undulation-fractures in the work of sketching out the Lake-system of our Lake-land. The North-and-South undulations themselves are connected with, and, as I read, contemporaneous with the Pennine elevation. So that both synclinal breaks, like Windermere ; anticlinal breaks, like some of the minor basins ; and fault-basins, like Coniston-water, owe their origin to the same causes and to the same epoch ; without which our district would have been a mountain-land, but not the land of Lakes.

9. *Share of Glacial Action in the Creation of Basins.* We have seen how large a part was played by entirely pre-glacial operations in the origin of Basins. What was the part played by Glacial Action ?

In the closest scrutiny of the minor basins, I have failed to find anything to shew that ice has been at work of erosion inside the basin, however much it has smoothed the surrounding rocks. If ice had any share in excavating these peat-basins, I venture to suggest that it must have been by tearing out and carrying away the already-broken blocks which filled them. The wonderfully distinct traces of ice-action close to their brinks prove that, if glacial erosion scooped out these basins, some tool-marks at least should be left ; but it is not so. Further, the shapes of these small basins are wholly incompatible with the theory that they have been produced by frictional erosion ; and the fact of the greater permanence of eroded rock-surfaces makes it all the more curious that the edges of these peat-mosses are not glaciated, while the upstanding rocks around them exhibit *striae* as fresh as if they had been cut yesterday.

But granting that such internal fracture and fissuring as the

structure suggests, and as a synclinal burst demands, may be gradually revealed by denudation; displayed, perhaps, with underground drainage in the fashion of an hour-glass; and you have the possibilities of one of these tiny basins, with no violation of probabilities, and in accordance with a rule which shews the localization of Lake-basins no longer as a work of hazard, but as an exemplification of a law of Nature. Then let the glaciers push and lift out the loose blocks, as we know they can; and crush in what they cannot push out, as we know they must,—and you have a form of glacial action much more suited to the purpose of creating these minor basins, than glacial erosion.

And if Candlestick Moss can have been so created, why not Loughrigg Tarn? and if Loughrigg Tarn, why not Windermere?

SOME OF THE OLD FAMILIES IN THE PARISH
OF CROSTHWAITE.

By J. FISHER CROSTHWAITE, F.S.A.

(Read at Keswick, March 16th, 1885.)

HAVING given in two former papers the best account I could of the Derwentwater family, and of the Radcliffes, the first of whom Sir Nicholas Radcliffe, married Elizabeth, sole heiress of Sir John de Derwentwater, in the reign of Henry V., A.D. 1417; and also of another notable family of the name of Bankes, in which I gave all the particulars I could gather of Sir John Bankes, whose Charity still keeps his name in memory,—I shall in the present paper confine my remarks to a few of the Notable Yeoman Families of the ancient parish of Crosthwaite.

Since the extinction of the House of Derwentwater, the records of that family, with the documents relating to the early history of the ancient manor, are gone. I am therefore obliged to take up such fragments of history as I have been able to collect from various sources, and put them together as well as I could. I have had but little spare time of late, and must therefore bespeak your indulgence for the hurried manner in which this effort has been made.

There can be no doubt that the yeomen of Borrowdale and of Castlerigg and Derwentwater are many of them occupying, and some are still owning, the self-same lands as their ancestors did before the Norman Conquest. There are other notable families besides those I am going to mention—such as the Leathes of

Dalehead Hall and Legburthwaite Manor, and the Brownriggs of Ormathwaite—but I must confine myself to the following.

THE STANGERS.

One of the oldest yeoman families in the parish is that of the name of Stanger. This is a German name; but it will be seen that a family called Stanger was settled here long before the advent of the German miners, who came in the reign of Queen Elizabeth. We find this German name in London, where it is pronounced Stänger, as it used to be pronounced here formerly.

It is reported that "Thomas Curwen, Knight, in the twenty-eighth year of King Henry VI., i.e. A.D. 1450, did ride and go all his bounden about the manor or lordship of Thornthwaite in the fells, taking then with him John Stanger, at that time feoffer of Darwent Fells, and divers others both old and young men.

"The original grant is dated 1255, remaining with Edward Ratelyffe, Baronet, now Lord of the said manor."

In 1616, John Stanger of Ullock is mentioned in one of the "Three Solemn Decrees" respecting their "most venerable old Church, and their very aged and much esteemed Grammar School." He is there set down as having in his hands "twelve pounds, fifty-one shillings, sixpence of the said school stock." It was the custom then for the eighteen sworn men to retain in their hands sums of money belonging to the school, and to pay interest for it, until a sufficient sum accumulated to enable them to purchase land for the further endowment of the school. The family left Ullock, and Edward, the eldest son, remained at Powter Howe; Daniel, at Braithwaite; James, at Wood End, Thornthwaite; and a sister, Hannah, married a Mr. Lowther. Thomas, the fourth of the family, married Elizabeth Blethwaite in November, 1673, at Cockermouth, where he settled. He was ordained deacon of the Presbyterian Church established there in 1651. He became deacon in 1695, and ruling elder in 1700. He was distinguished as one of the early active members of the church, and when this church suffered persecution in the reign of Charles II., many of its meetings were held in his house.

This Thomas Stanger was great-grandfather of James Stanger, who was born in the year 1743 at Cockermouth, where the family then resided. He went to London in 1763, where he soon entered the house of Mr. Francis Moore in Cheapside, a most liberal and worthy man, distinguished by several ingenious mechanical inventions.

He married a distant relation of the same name, Miss Hannah Stanger, sister of Dr. Stanger of London. This was on the 10th October, 1791.

In 1771 he was admitted into partnership with Mr. Francis Moore, in connexion with Mr. Topham and Mr. James, and he was subsequently for many years the senior partner in that respectable firm. He retired from business in 1823, when his younger son was admitted a partner, as his elder brother had been seven years before.

In 1810 Mr. Stanger purchased the Lairthwaite estate (then called Dove Cote), and built a mansion, where he generally enjoyed the society of his relations and friends during three or four months in the year.

A record of the period says of him as follows :—“Died April 4th, 1829, James Stanger, Esq., in the eighty-sixth year of his age. Of this estimable man it may be truly said, that as few live to so advanced a period of life as he did, so there are few who have exhibited more unblemished integrity in business and social intercourse, or more consistency of character. His descendants and connexions, near and remote, will long cherish his memory, both on account of the example which he set them of steady, well-regulated, and rightly-principled exertions in his sphere of life, and on account of the uniform kindness which he displayed.

“The reward of diligence in business was opulence; yet not that opulence which blazes out like a meteor, and is sudden, deceitful, and oftentimes really injurious, but a gradual advance in the career of prosperity, honourable to the commercial character, and advantageous to the community, by the opportunity which it afforded him during many years of his later life, of devoting a considerable portion of his time to general usefulness, and likely,

it is hoped, to be permanently beneficial to those whose interests it promoted along with his own.

“Modest and unassuming, sincere and uniform, he lost no friends except by death; and it was his happiness to gain many friends as life proceeded. He was a firm Dissenter from principle, but without the least bigotry, and a warm friend of general liberty, without any of the asperity of a party man. A kind Providence blessed him with a very considerable portion of strength and vigour, even beyond the period of four-score; and just when life, owing to increasing infirmities, was beginning to be nothing but labour and sorrow, God called him by an easy transition to the reward of the good and faithful servant.”

There are many still living who remember him, as I do, coming to Lairthwaite every summer. His venerable appearance in his carriage, driven by old Tom Bowe, his venerable-looking coach man, was striking. He always attended divine service in the parish church, where he had a pew. He gave off land from Dove Cote field to widen the church lane, which is now the side-road for foot passengers.

On his decease his eldest son, Mr. James Stanger, came into possession of the property, which he enlarged by building a wing, in which he had an excellent organ built by Hill of London.

The memory of this good man is still fresh in the minds of many. He was a devoted laymen and a staunch adherent of the Reformed Church of England. As superintendent of the Crosthwaite Sunday school, he built the present school at High Hill expressly for that purpose, as will be seen by the inscription on the porch, “Crosthwaite Sunday School, 1833,” the school having been previously carried on for a short time in the church, and afterwards in the National school close by, formerly the Quakers’ meeting house.

Of his labours as a layman I must not now speak, for they would take a paper of considerable length to give even a sketch of them. His Sunday evening services and lectures in the school room, conducted there for sixteen years, were much appreciated, and fully attended, not only by the parishioners, but by many of

the tourists during the season. His restoration of the parish church, at a cost of over £4,000, is a lasting monument to his memory. His advocacy of the Church Missionary Society, the Bible Society, and the Society for Propagating Christianity amongst the Jews was effective, and he frequently accompanied the deputation to other towns to assist in the work. He was a supporter of many other similar societies, but he founded branches of those I have named in Keswick, which still flourish. His memory is cherished in the hearts of all who were so happy as to come within his influence ; and the result of his life-long labours in the cause of religion and education will remain for generations to come.

The name of TICKELL is also among the earliest of the dalesmen, and although of German origin, the family was settled in Cumberland before the colony of German miners.

Of this family was Hugh Tickell, a Quaker, who was distinguished for his zeal as a preacher, and for the sufferings he underwent for his religious convictions. The following notice of him is extracted from a tract published by Dorothy Tickell, his widow.

“Hugh Tickell was ‘convinced’ in 1653, when George Fox first came into Cumberland, and he gave up his house for meetings. And in time the Lord blessed him in both ‘spirituals and temporals,’ and he became a minister of the Society, and in that capacity he travelled in Scotland, the west of England, and other places. He suffered much for his ‘testimony,’ both in the spoiling of his goods and imprisonment of his body for tithes ; as in the year 1664, he and four friends more were cast into Carlisle gaol by Henry Marshall, priest of Crosthwaite : though he kept him in prison about three years, yet he took tithes of his land. But afterwards this priest Marshall fell down a pair of stairs, and broke his skull, upon which he died. He was afterwards imprisoned in the same gaol in his old age (being about sixty-eight years old) by Richard Lowry, another priest of the said Crosthwaite, because he would not pay him tithes ; who kept him in prison about nine months, part of it in cold winter, and in a cold nasty place, not fit for honest men to lie in, till Providence ordered his enlargement.

And this priest Lowry was suddenly stricken, and had all the use of one side of his tongue, and his understanding much taken from him, and so he continued a long time. The said Hugh Tickell patiently bore all his sufferings, and willingly endured these for the testimony of Jesus and for a good conscience. But in his last imprisonment he contracted a distemper of body which, increasing upon him after he came home, he grew weak, but continued in great patience, 'set his house in order,' and died."

The registers of the Society of Friends contain no account of his death. In Besse's "Sufferings of the People called Quakers," quoted by Mr. R. S. Ferguson, F.S.A., in his appendix to his notice of "Early Cumberland and Westmorland Friends," he gives the date of Hugh Tickell's second imprisonment 1682, and the printed account of him, Thomas Laythes, and others, was published, according to Smith's Catalogue, in 1690, so *that* must be the latest date we can assign as that of his decease. The account says that he was buried at Portinscale, but the old meeting-house graveyard at High Hill would be the place of his interment, being the nearest burial place for that body, to Portinscale.

On the 27th February, 1685, the properties called the "Quakers' Charities," in this parish, were in part conveyed by Hugh Tickell to trustees, two-thirds of the property to go the County Charity, and one-third to the parish of Crosthwaite. And on the same day he devised by will certain fields to the same trustees, with reservation in each case for his own life and the life of his wife Dorothy. A complete division, with a partial exchange, of the two properties was made in 1769.

The property held for the county includes the farm at Millbeck long tenanted by Mr. Stamper's family, and School House Orchard at High Hill, upon a portion of which the Crosthwaite Sunday School is built. The old meeting house at High Hill, now converted into two cottages, with the burial ground close by, still belongs to the Quakers' Charity. The portion of the charity given to the parish of Crosthwaite is distributed at Easter by Mr. Charles Christopherson, Mr. Joseph Wren, Mr. Joseph Hall, and Mr. William Mayson.

In the parish register, December 26th, 1702, is the following entry of burial, "Dorothy Tickell, of Portenskell, Widow, Quaker, was buried in Wooline, according to Act of Parliament."

The WRENS OF CASTLERIGG were an ancient and opulent yeoman family. There was a Mr. Justice Wren, who was a magistrate, and who is mentioned in the Crosthwaite Parish Registers as having celebrated marriages during the Commonwealth. There was also a Gawen Wren, who was contemporary with Francis, first Earl of Derwentwater. He took a lease of the Town Cass, which led to a lawsuit in the time of his widow, when John Fisher of Naddle and twenty-eight other tenants combined to claim the property as common to the tenants of the manor, to cut grass for their cattle when they came to market, and also to cut withes to bind the thatch upon their houses. The tenants prevailed in their contention, after eight or nine years' litigation. It was said at the time that the land was only worth twenty pounds—and the tenants had one hundred pounds to pay in costs, although they won the suit.

The enfranchisement of the manor of Castlerigg is dated the 18th August, 1623, and although Nicholson and Burn say, Vol. ii., p. 80, that Gawen Wren's was the principal tenancy enfranchised, I find on reference to the deed, that John Bankes, son of William Bankes of Castlerigg, and John Bankes of Eskembeck, paid more money for their lands than he did. But the family acquired other estates subsequently, until it is recorded in the court rolls of the manor that they held thirteen lands and tenements in Castlerigg and Derwentwater.

On the 23rd of January, 1721, Grace Wren of Castlerigg, spinster, made her will, and among other bequests she left the following:—"First, I give and bequeath unto my brother Gawen Wren, and my cousin John Wilson of Ashness, the sum of forty pounds in trust for the use of the poor children born within the parish of Crosthwaite aforesaid, that is to say, that my trustees shall lay out the said sum of money, or purchase a piece of freehold land with the same, and with the interest and profits of the said money or land my said trustees shall yearly lay out in buying

school books and bibles with the same, the said books so bought to be distributed by my said trustees yearly about the time of Easter to and amongst such poor children born in the said parish of Crosthwaite, who if mindful and willing to learn English, and whose parents are not of ability to buy them books; *in hopes that this small gift of mine may encourage some children to learn to read and thereby they the better understand their duty both to God and man.*"

The will was never proved, but the document bears the endorsement by her father, "My Daughter Grace' Will."

It was, however, immediately acted upon, for on February 24th, 1722, the first record states as follows:—"Mrs. Grace Wren first charity books was given at Crosthwaite Church by Gawen Wren, junr., and John Wilson of Ashness, who were desired by the Doner to se them Distributed every yr. As long as they Live, and after their time to their heirs for the good of the poor of the parish of Crosthwaite, for Ever. The Forty pounds is now in Mr. Wren's hand, and is to be laid out on Land, as soon as a purchase can be met with. The interest of it is to buy Bibles yearly."

Eleven Bibles and five Testaments were given, and the names of the recipients follow; amongst the number is "Gyles Senogle of Crosthwaite, son a Testament." May 24th, 1728, the trustees bought of Thomas Birkhead of Stonethwaite, for thirty pounds, land called Scale Close, Dalts, and Scale Brow, lying between Seatoller and Longhwaite; and February 1st, 1741, the trustees bought of Barbara and Ann Wren all that Meal Tithe rent of seven shillings and ninepence due and paid on the 25th of April out of a messuage called Birkhow-sykes, then in the possession of the Rev. Isaac Robley, clerk, minister of St. John's.

The Charity has now an income as follows:—

From Consols - - - - -	£6	3	8
From Land in Borrowdale - - - -	7	10	0
Meal Tithe paid by St. John's in the Vale Vicar	0	7	7

£13 11 3

Ten grants in money are made to different schools for the purchase of Bibles, Testaments, and School Books.

Frances, daughter of the last-named Gawen Wren married Mr. John Langton. He was succeeded by his son, Gawen Wren Langton, who died in 1790, and he was succeeded by his son, Thomas Langton, who sold the capital mansion and estate adjoining to the late Mr. Thomas Birkett of Portinscale, from whom it passed to a nephew, whose daughter (Mrs. Barnes of Carlisle) now owns it.

The Brighthouse, Howgate, and other tenements, were sold by Mr. Thomas Langton to the late Mr. Joseph Tickell, formerly of St. John's Vale.

Excepting Miss Grace Wren's admirable charity, and a mural tablet on the north wall of the parish church, there is now no visible memorial of the former consequence of this influential family in the parish. On the tablet is inscribed :—

Erected in Memory of Mr. GAWEN WREN,
of Castlerigg,
who departed this life
28th day of April, 1738,
aged 86.

Who was a lover of his parish,
a kind friend, and
a tender father.

The late Mr. Abraham Wren once informed me that the old family of the Wrens of Little Town in Newlands, was descended from a junior branch of the Wrens of Castlerigg.

GOVERNOR STEPHENSON, a native of Keswick, was buried in the parish church. In the pavement before the communion rails is a large gravestone which bears the name of Edward Stephenson, formerly Governor of Bengal, of whom a summary account may be given.

In a manuscript in the British Museum, written by one of the family, it is stated that he was descended from Rowland Stephenson of Swinefleet, in Yorkshire, who at the time of the Spanish Armada led eighty men into the field for the defence of his native land,

and that his father, Edward Stephenson, settled at Keswick in the seventeenth century. Governor Stephenson was born in the year 1688, and dying intestate in 1765, aged seventy-seven, his only brother John, succeeded to his estates, which in default of issue of his only son Edward, John devised to Rowland Stephenson, a distant collateral relative, who subsequently sat in Parliament as Member for Carlisle, and in 1782 became seized of them on the death without children of the last-named Edward. Upon Rowland's decease in 1807, his only son, likewise named Edward, inherited; and on his decease, the estates devolved upon R. E. W. P. Standish, Esq., of Farley Hill, Berkshire.

Having entered upon a commercial life, the subject of this notice embarked for Calcutta in the year 1707, then nineteen years of age, in the service of the United Company of Merchants trading to the East Indies, where he rose to eminence as a factor or merchant in the English factory, and in that vocation gathered the nabob's fortune, with which, after many years, he acquired many valuable estates in the north of England.

In 1715, Mr. Stephenson, with two others of the ablest factors, was deputed by his brother traders to proceed to Delhi, with a memorial which humbly stated their claims upon the Mogul Government for protection, enumerated the hardships under which they laboured, and prayed not only for relief, but for the enlargement of their juridical authority within the precincts of Calcutta, as well as for the grant and assurance of ample privileges in the rich traffic in which they dealt. Innumerable obstacles retarded the progress of the mission; but at length, after the lapse of nearly two years, its objects were fully attained, but not, indeed, through the art of diplomacy, but out of the Mogul Emperor's gratitude to a medical gentleman of the name of Hamilton, who accompanied the party, and who had the good fortune to cure that potentate of a disease which had baffled the skill of his own Indian physicians. On being commanded by his imperial patient to name his reward, the generous doctor, with the virtue of a public-spirited man, who preferred the Company's interest to his own, solicited as his only recompense the advantages sought for by them. A firman was

thereupon issued in 1717, which, inclusive of other immunities, not only confirmed all former grants to the Company, but allowed them liberty to trade free of customs, to construct new fortifications, to coin money (in the same manner as they had been permitted in 1691 to purchase Calcutta). thirty-seven villages, so as to give them a district extending ten miles from that factory on each side of the river Hooghly; and with that decree, the beneficial effects of which have been experienced by the English to this day, the mission took leave of the Emperor, and returned to Calcutta. On the death of Henry Hankland on the 28th August, 1728, Mr. Stephenson, as the oldest member in Council, was by his colleagues chosen *president*, an appellation first given to the chief executive officer of the factory in 1700, that of *agent* only having been previously used, and the title of Governor not having been conferred until 1758, when the celebrated Colonel Robert Clive, afterwards elevated to the peerage as Lord Clive, was appointed first Governor of Bengal; for so humble were the views of the Company in Mr. Stephenson's days, and so little resemblance did its chief servant bear to a Governor General in later times, that the outlay of a little more than one hundred pounds in the purchase of a chaise and pair of horses for the President of Calcutta, was refused as a reprehensible piece of extravagance, and the amount ordered (7th January, 1725,) to be repaid, the Court of Directors observing that, if their servants *would* have such superfluities, they must pay for them themselves. The presidency of the factory at Calcutta was accordingly held by Mr. Stephenson until the arrival from England, on the 18th September, 1728, of John Dean with the Company's commission as president.

Upon his return to England, Mr. Stephenson took up his abode at Keswick, having built the large house near the entrance to the town on the Ambleside road, called Governor's House, which though now stripped of much of its former respectability, was then the only mansion of any consequence in his native place. There he lived for many years, during which he bought not only Holme Cultram Manor and Abbey, with Brecon Hill Tower, and

lands about Derwentwater, but in 1741 also became the owner of the Manor and Castle of Scaleby, by purchase from Richard Gilpin, Esq., recorder of Carlisle. The Royal Oak Hotel was built by the Stephensons upon the site of the former inn, which was the house from which the Governor went out to India. In the churchwardens' books there is an entry showing that Mr. Stephenson supplied the wine for the sacrament at the parish church. Mrs. P'Anson sent out one of her sons to India from the Royal Oak, when she was landlady, in the hope that he would return with a nabob's fortune, as Governor Stephenson had done.

The celebrated Richard Watson, Bishop of Landaff, in his autobiography, which was published by his son, the Rev. Richard Watson, LL.B., in 1814, has near the commencement the following characteristic remarks:—"All families being of equal antiquity, and time and chance so happening to all, that kings become beggars, and beggars become kings; no solid reason, I think, can be given why any man should derive honour or infamy from the station which his ancestors filled in civil society; yet the contrary opinion is so prevalent, that no words need be employed in proving that it is so. German and Welsh pedigrees are subjects of ridicule to most Englishmen; yet those amongst ourselves who cannot inscribe on the trunk of their genealogical tree the name of a peer, bishop, judge general, or any person elevated above the rank of ordinary citizens, are still desirous of showing that they are not sprung from the dregs of the people. Without entering into a disquisition concerning the rise of this general prejudice, I freely own that I am, on this occasion, a slave to it myself. I feel a satisfaction in knowing that my ancestors, as far as I can trace them, have neither been *hewers of wood*, nor *drawers of water*, but *ut prisca gens mortalium*—tillers of their *own* ground, in the idiom of the country, *statesmen*."

It is with some such feeling that I approach the account I am now going to give of the family of CROSTHWAITE. I am indebted to that indefatigable antiquary, Mr. William Jackson, F.S.A., of St. Bees, for the earliest written record I have of the family of Crosthwaite. He found amongst the Curwen papers a grant made

by Walter Fitz Roger of Threlkeld, to Sir Adam de Crosthwaite, which he got photographed, and of which he gave me a copy. It is written in contracted Latin. I sent it to a gentlemen in London, a barrister, who undertakes the translation of such documents. He gives it first in brief, then in full Latin, and then in English. The date is the fourth year of the reign of Edward III. [1330 or 1331.]

“To all sons of Holy Mother Church who shall peruse this present writing or hear it read. Walter Fitz Roger of Threlkeld (sends) Greeting. Know ye that I have Given and Granted, and by this my present Charter have Quitclaimed and Confirmed, to Sir Adam de Crosthwaite, All that land of Mosshouse in Setmabanwick which formerly belonged to my father Roger, And All the right that I have or might have in the same To Have and To Hold to himself and his heirs or to his assigns, In Fee and heirship, freely, quietly, integrally (and) peacefully, in wood in plain, in meadows and pastures, in moors and marshes, in ways and waters, and in all liberties and easements and free common rights to the said land of Mosshouse in Setmabanwick within or without appertaining, So, that is to say, that neither I nor my heirs can in future assert any right or claim to the said land at any time, And that this grant and enfeoffment shall faithfully and without fraud or deceit be observed and kept, I have sworn with the Holy Evangelists in my hands. In testimony whereof I have to this present writing affixed my seal in the presence of these witnesses.

“Sir Thomas de Lowther, Sir Thomas de Brougham, Peter Dauncer, Nicholas the Frenchman, William Blount and Robert his brother, William de Crosthwaite, and others.

“Given at Crosthwaite in the Fourth Year of the Reign of King Edward the Third.” [A.D. 1330 or 1331.]

At the commencement of the Crosthwaite parish register there are baptisms, April 4th, 1618, of Anne, daughter of Robert Crosthwaite of Fornside and Jane his wife.

2nd Feb., 1622. Isabell Crosthwaite, daughter of Christopher Crosthwaite of Smathwaite and Eleanor his wife.

Oct. 26th, 1625. Robert, sonne of John Crosthwaite of Stork-

house and Margaret his wife. (He was afterwards of Wanthwaite, and is once called in the register "John de Wanthwaite.")

April 4th, 1627. Frances Crosthwaite, daughter of Percival* of Setmabanning and Elleanor his wife.

At this time Percival Crosthwaite seems to have been the eldest of the elder branch of the family, and resided on the principal estate, Setmabanning. His marriage is recorded thus:—"June 11th, 1626. Of Percival Crosthwaite of Setmabanning and Elinor Grave of Burns."

The younger branches of the family each left descendants, who subsequently lived at Hollin Root, Beck Wythope, Birket-myre, Brundholme, Castlerigg, Dalehead, Monk-Hall, and Keswick as farmers, while the elder branches remained at Setmabanning, and Wanthwaite, in the Vale of St. John's, and at Storkhouse, which has now gone to ruin. We have the following entries in the parish register:—

1692. January 1st. John Chrosthwaite of Wanthwaite, buried in church.

(In 1705 John Crosthwaite was residing at Setmabanning, and in 1716 the resident there was Thomas Crosthwaite.)

The following burial is recorded:—

1729. December 26th. Jane Crosthwaite of Setmabannin widow (Quaker).

The family ultimately were settled at Wanthwaite.

* The following extracts of births from the parish register shows that the Crosthwaites of Monk-Hall and Keswick are descended from a younger son of Percival Crosthwaite of Setmabanning:—

BAPTISMS.

Feb. 1st, 1634. Christopher Crosthwaite, son of Percival of Setmabanning and Ellinor his wife.

Oct. 13th, 1667. Christopher Chrosthwaite, son of Christopher Chrosthwaite of Pietnest and Jane his wife.

Aug. 14th, 1702. Robert Chrosthwaite, son of Christopher Chrosthwaite of Burns and Ruth his wife.

Sept. 22nd, 1735. Peter,† (second) son of Robert Crosthwaite of Dalehead and Mary his wife. (Afterwards of Monk-Hall.)

† Peter Crosthwaite founded a Museum, in Keswick, in the year 1780, and it remained in the family till 1870, when it was disposed of.

1749. March 10th. We have the burial of Timothy, son of Peter Crosthwaite of Wanthwaite.

But the family sent off sons who settled in other places. Mr. William Jackson, F.S.A., found in the register of St. Nicholas church, at Whitehaven, as follows:—

1700. May 12th. Peter Crosthwaite, ye son of Tho. Crosthwaite of the Parish of Crostat.

Buriall.

Duty to ye King, 4s.

At that time there was a duty on births, deaths, and marriages. "It was an expensive thing to die," Mr. Jackson observes, "marriages and births were encouraged by a lower rate of duty." I find on reference to our register of births that this was a young man from Setmabanning.

One member of the elder branch of the family went from Setmabanning or Wanthwaite, and settled in Ireland, a long time ago. I am unable to fix the date. Mr. Richard Hone, Suffolk-street, Dublin, says:—"The family are probably descended from a Thomas Crosthwaite, described in an ordinance made in the year 1654, for 'settling one hundred pounds per annum in Ireland upon Richard Uriel and Thomas Crosthwaite, of Cockermouth castle, in the county of Cumberland, in satisfaction of their losses and faithful services.'" This ordinance was confirmed by the Act and Declaration (made by Cromwell's Parliament) touching several acts and ordinances made since the 20th April, 1653, and before the 3rd of September, 1654, and subsequently by an Act of the Irish Parliament, fourteenth and fifteenth Charles II., chapter 2, section 20, (1662,) a grant of land, yielding one hundred pounds a year, was directed to be made in favour of Thomas Crosthwaite.

It would no doubt be interesting to know what the faithful services and losses were that Royalists and Cromwellians alike considered should be recompensed.

Three brothers of this family became clergymen of the Established Church. The eldest was the Rev. John Clarke Crosthwaite, A.M., who began his ministry as Dean's vicar of Christ Church Cathedral, Dublin, and examining chaplain to the Bishop

of Kildare. He afterwards became rector of St. Mary-at-Hill, London, and Barnard Hyde's lecturer. He was the author of several works, among which are "Twelve Lectures on the History of Esther, an illustration of Providence, to which is added Six Discourses on the doctrine of a particular Providence." 1858. Also, "Eight Lectures on the Book of Daniel, and Four Discourses on the doctrine of Mutual Recognition in a Future State." Two volumes on Modern Hagiology, and other works. The youngest of the three brothers, the Rev. Benjamin Crosthwaite, was formerly at St. Andrew's, Leeds. He is canon of Ripon, and is now vicar of Knaresborough. Although above fourscore, he is still active, and I heard him preach an excellent sermon in his own church last summer. He revisited the home of his ancestors and sojourned at Gale Cottage on two occasions, and he preached some years ago at morning service for the Crosthwaite organ fund, and his son, the Rev. Robert Jarrat Crosthwaite, preached in the evening. The latter has recently been appointed a prebend of York, and to a living in that city. The other brother died of fever in Ireland, during the Irish famine.

I will not follow out the junior branches of the family, which would lengthen out this paper beyond the proper limit; and having given a separate notice to this Society of Peter Crosthwaite, founder of a museum in Keswick, which appeared in your *Transactions* for 1877-78, this may be a sufficient reason for leaving out any fresh matter which I have since acquired. But, I cannot forbear mentioning that the last representative of the eldest branch died in India. He left his home at Wanthwaite without giving any intimation to his family, and took service in the Royal Marines. He wrote to his mother from Fort George, India, apologizing for the trouble he had occasioned her by his departure, and saying that he would now adhere to his determination to try his fortunes abroad. He requested his brother-in-law, Mr. Sanderson, to see Sir Henry Fletcher or Mr. Crackenthorpe, to procure him a cadetship in the H. E. India Service. Failing that, he said, he must pass away "unknown, unwept, unsung." He died abroad, and left his property by will to Mr. John Sanderson, in trust. It con-

sisted of Stockhouse (or more properly, Storkhouse), Wanthwaite, Walk Mill, Crook, and Little Ings. It passed to Mr. Daniel Sanderson, and after him to his younger brother, John Sanderson, who afterwards sold it to the late Mr. Abraham Fisher, whose executors sold Wanthwaite to Mr. Henry White of London, whose fore-elders sprang from the same valley of St. John's.

This is one instance showing how far back most of the yeomen families might be able to trace the possession of their holding, if they only had a friend like Mr. William Jackson, F.S.A., to go into the records held by lords of manors like those of the ancient family of Curwen.

The name of FISHER is of great antiquity.

In the ministers' accounts, 33 Henry VIII. (1542) for the Furness monastery, we have the names of all the holders and of the payments made by the freeholders of Borrowdale for the dues payable to the church, which at that time were paid to Henry VIII. and continued to be so paid till in 1615, when the dalesmen paid for the enfranchisement of their estates the sum of twenty-five pounds, two shillings.

I see that in a paper which I read before this Society on "Old Borrowdale," 2nd June, 1875, I gave the names and amounts paid by each tenant (in 1542) to John Fysshier and Launcelot his son, who were "Bailiffs of the Lord the King there for the time aforesaid." There were eight Fyshers, six Burkheads, three Brathwaytes, three Udales, one Lambert, one Hynde, two Harveys, Hugh Richardson, and John Jobson.

In the great deed of Borrowdale executed 1613, (seventy-one years later,) we still have the same names, with the addition of Lamplugh, Hudson, Banks, Howe, and Sir Wilfrid Lawson of Isel, as amongst those who bought their property free.

The fortunes of the dalesmen have been increased from time to time by second and younger sons going out and succeeding in business in the metropolis. In the year 1788, Isaac Fisher, son of Mr. Joseph Fisher of Seatoller, was apprenticed to a silversmith in London, and the witness to his indentures was William Birkett, a banker's clerk, who went from Borrowdale; who was the person

who first suggested the clearing-house system for private bankers, which is now also in use by all joint stock banks, and by the railway clearing house,—for which he received a retiring pension from the London private bankers.

Mr. Isaac Fisher died at the early age of forty-five, in the year 1819. He was an instance of great ability and energy in business transactions, and would no doubt, like his friend Sir Richard Birnie, have risen to eminence in London, if his life had been prolonged. He amassed a considerable fortune, which he left to his brother, Mr. John Fisher of Seatoller, and an adequate competency to his sister, Mrs. Gibson of Powter Howe, and others of his relations. The former bought many valuable estates in Borrowdale, and others in this neighbourhood, leaving his youngest surviving son, Mr. Abraham Fisher, a large landed proprietor. Perhaps I may be allowed to quote the last paragraph in my paper on "Old Borrowdale" respecting this worth dalesman.

"As a representative man, the Borrowdale statesmen never had a worthier than Mr. Abraham Fisher, J.P., of Seatoller. Living among his own people, thoroughly understanding and appreciating his neighbours, he exercised an influence social, moral, and religious, which was felt during his life, and will be remembered for many years to come. He was the last of the Fishers of Seatoller, and no nobler man could be found to be the last representative of his family and name in Borrowdale."

The following lines upon Mr. Abraham Fisher were written by the Rev. James Dixon, a native of Borrowdale:—

Weep, ye 'mong whom he dwelt, for he is gone—
 The man of kindly speech and tender heart ;
 Whose wealth sat lightly on him—never seemed
 A barrier set between yourselves and him.
 But he has left it all, and left besides
 What is a thousandfold more precious
 Than all the wealth and honour of this world—
 A bright example : for he had that faith
 Which lifts the heart above all earthly things,
 To crowns that fade not, goodly mansions built
 Within eternal walls, where never come
 Nor death, nor tears ;—that heaven-born faith which makes
 The poorest man far richer than a king,
 And gives him comfort in the darkest hour.

OUR SUMMER VISITORS.

BY T. DUCKWORTH.

(Read at Carlisle.)

THE GRASSHOPPER WARBLER.

THE first visitor I am going to speak about is one of the shyest, and perhaps the least-seen, of any that we have in this country. Have you ever heard on a fine summer evening, a peculiar trilling sound, like that of a cricket? If you have, it is the song of the Grasshopper Warbler (*Salicaria locustella*), a bird which is known in France, Italy, Holland, Germany, Switzerland, as well as in Denmark and Sweden. This bird arrives here about the 29th of April. It is fairly plentiful in some parts, but is very local in its distribution. I believe it is unknown in the southern part of this county. I have heard it near Stainton, Kingmoor, Newbiggin, Brisco, Wreay, Cumwhinton, Todhills, Wragmire, Orton, Newby Cross, and in different parts on the banks of the Petterill, the Caldew, and the Eden. In some years it appears to be more numerous than in others. By referring to my note book, I find that in the years 1880 and 1881, they were very numerous in their favourite localities. They prefer the dry furzy commons, the outskirts of woods, and open parts in the same; but I have heard them also in rough occupation-lonnings. The best time to see this bird is on its first arrival, as the males are the first to come, and they then select the topmost twigs of the heather, furze, etc., to utter their cricket-like cry, which is their only song of love. My brother in May, 1879, saw and heard six males, all trilling within

a radius of two hundred yards, on Newbiggin Fell, at an elevation of 1140 feet. After they are paired, there is seldom any more perching at the top; they are then very shy and recluse in their habits, and seldom move far from the spot they have first selected. They are not easily disturbed, and are loth to take flight, so that, after pairing, it is very difficult even to see the bird at all; they trust for concealment to the surrounding herbage. The whole bird is very closely feathered, presenting no point that can be easily ruffled on a forward motion, so that it can glide through the closest and thickest undergrowth. It slips into the cover one knows not where, and threading along without stirring a twig, it will in an instant slip out again at a point several yards distant. Just before the bat and the owl sally forth in quest of their prey, is the time to listen to this warbler; its note falls on the ear so plaintively, sometimes starting very low, increasing in loudness, and gradually rising nearly a tone, then imperceptibly falling a semi-tone, and appears to fade away in the distance, till it increases in loudness again and gradually falls away. It has a wonderfully weird effect on any listener, heard in the calm hours of the night. I remember well, when staying in the neighbourhood of Silloth, my bedroom window looked out on a furze-clad common, where there were several Grasshopper Warblers, who sang all through the night, and up till eight o'clock in the morning. I can tell you I did not get much sleep, as I was noticing the peculiarities of their different modes of expression and intonation. Some naturalists say that it has the power of ventriloquism, but this I take exception to, as on several occasions I have taken notice of this so-called power, but more particularly on one occasion, down in Stainton banks, I crept upon my hands and knees to within a few feet of the bird, and in the twilight I could observe its bill quivering whilst it was uttering its song, which was accompanied with a curious shivering of the wings, and I noticed that the apparently so-called ventriloquism was produced when the bird turned its head in different positions; and I must say the sound did appear to come from several directions, and yet it was clearly the production of the same bird. I have also observed this in the Corncrake.

In the many years that I have been an observer, I have never heard this warbler in the daytime, after eight, a.m. They continue their song till about the middle of August; and as I never hear them after that time, I presume they leave us early in September. As may be supposed, the nest of this bird is one of the most difficult to find of any we have breeding in this country. It is a red letter day when the naturalist find this bird's abode, and its eggs are always considered a valuable addition to the cabinet of the oologist. How many ornithologists have ever seen this bird's nest? The Rev. C. A. Johns, in his "British Birds in their Haunts," says, "its nest I have looked for in vain." Now I am happy to say that I have found several in my time, and a pretty sight it is to see the nest *in situ*. You can never flush this bird off its nest, as it quietly slips off and scuttles through the herbage, just like a mouse. I remember on one occasion, one slipped off its nest from between my feet, and even after that I had the utmost difficulty in finding it, so dense was the undergrowth. The nest is almost always concealed in the most secluded and thickest part of the cover, although there are some exceptions to this rule. All that I have seen were composed of dry grass well interwoven, and were lined with finer grasses in the inside. In shape the nest is like a deep cup. The number of eggs is generally five; although I have found them with six. They are very beautiful, of a pinkish-grey, and are mottled all over with minute spots of a darker colour; sometimes the colour forms a dark zone, with a dark hair-streak round the larger end. They also vary much in size, as I have seen clutches twice the size of others. I have found the nest of this bird on the following dates: May 14th, 17th, 19th, 30th; June 6th, 16th, 19th, 21st, 23rd; and also on the 6th of August.

THE REDSTART.

In some of your country rambles, you may perhaps have observed a bird flitting uneasily before you out of the hedgerow, or the stone dyke, and displaying his reddish-orange tail, a bird which is locally known here as the Redtail, or Redstart* (*Phœnicura ruticilla*).

[**Start* is an Old English Name for tail. Ed.]

The constant jerking motions of this appendage, with which it accompanies its change of position; the remarkable way they close and expand their tail, so rapidly and frequently, taken in conjunction with the colour, so clearly distinguish it, that you cannot mistake the Redstart for any other bird. This visitor is distributed over the greater part of Europe, from France, Italy, and Spain, to Holland, Germany, Denmark, Sweden, Norway, Russia, and Siberia, and according to Temminck, is found in Japan. It is a bird of no great abundance anywhere, and in some parts is considered rare; it regularly resorts every year to some places, and in others is never seen. In this district it is fairly plentiful; you may see it from the garden wall, up to a height of nine hundred feet on Croglin Fell. It is partial to old ruins, and especially if covered with ivy; old walls, outbuildings, and in the suburbs of towns; you will also find it in the depths of woods, particularly those of the birch. It arrives here about the 11th of April, and departs about the end of August or the beginning of September. The young birds leave before the old ones. The male is one of the handsomest birds we have, and is sure to attract attention with his white forehead and black throat, particularly when perched on some commanding situation—the top of a tree, top of a post, or on a jutting pinnacle of a ruin. This bird on its first arrival (the male precedes the female) will sit and sing for hours in early morn, and anyone who has seen and heard him, from the top of some ruined abbey or old castle, is not likely to forget his somewhat plaintive strain. The song of this bird varies much in its expression, being sometimes low, soft, and sweet, and at other times bold and jerking, reminding one of the Common Wren's vernal spring roundelay. Although knowing the song of the Redstart so well, I was once, when up at Aldby Field, on the foothills of the Pennine range, much struck by a peculiar song which sounded from an orchard. I was not satisfied till I had made out the songster, which turned out to be a Redstart, perched on the top of an apple tree. I had never before, nor have I ever since, heard the same song from the Redtail; it imitated the song of several birds, notably those of the Blackcap and the Garden Warbler, and mixed their

strains with its own with excellent effect. It appears to be a bird which can be taught certain airs, as Mr. Yarrel mentions one that was in the possession of Mr. Sweet, which could whistle the Copenhagen waltz. I have heard this bird sing whilst on the wing; after pairing he does not perch so high when singing, but yet always where he can see around him. They nest in various situations: holes in trees, in old walls, sometimes in ornamental vases in gardens, on the ledges of outbuildings, and in bowers covered with ivy, sometimes in holes two or three feet deep, and at other times only a few inches. I have seen it under the coping of a wall on the public road, where people were passing every few minutes within a few feet of it. The birds nest in the same holes every year. I know of one hole, in a tree near to the Asylum, where there has been a nest year after year ever since I was a boy. The Rev. C. A. Johns mentions a pair of Redstarts, who, themselves, or their descendants, for twenty years, nested in the box of a wooden pump. On one occasion, the pump being out of order, the owner employed workmen to repair it. This proceeding offended the birds, who deserted it for three years, and then forgetting, or forgiving, the intrusion, returned to their unquiet home. Another pair constructed their nest for ten successive years in the interior of an earthenware fountain placed in the middle of a garden. This species is singularly attached to its nest. We remember one which had made its nest in a garden wall, being discovered by a young lady, who used to visit it daily, and who dexterously caught the old bird while sitting, and carried it with great tenderness into the house to show her sister, and then replaced it on the nest. Notwithstanding this, and that the eggs and young were frequently handled, the Redstart reared her brood safely; and the lady looks for the arrival of her friends every summer. Bishop Stanley mentions one which built its nest on the narrow space between the gudgeons or upright iron on which a garden door was hung; the bottom of the nest, of course, resting on the iron hinge, which must have shaken it every time the door was opened; nevertheless, there she sat, in spite of all this inconvenience and publicity, exposed as she was to all who were constantly passing to and fro.

I once saw a nest built in a wooden shed in High Stand plantation, where they were sawing timber; the nest was about three inches above the man's head who was attending the engine, yet the bird sat quite still and incubated her eggs. This nest was the prettiest I have ever seen of this bird; the outside was built of the fronds of the common bracken, and was beautifully lined with the feathers of the pheasant, and the pure white feathers of barn-door fowls. The male bird is very fussy when you approach too near to the nest, complaining with a querulous note. He is very attentive to the female while sitting, and sometimes feeds her while on the nest. I have watched the male bird with a caterpillar in his mouth to feed her with, but he would not go near till I had removed a considerable distance, and then I watched him through the field glass. The nest is generally loosely constructed, and is formed of moss and dried stalks of grass, and is lined with feathers, and sometimes a little hair. The eggs generally number six, although I have found them with seven and eight; they are of a light blue colour, elegant in shape, but very fragile. The food of these birds consists of insects, caterpillars, beetles, worms, and various fruits. From its song, together with its light, elegant shape, its varied plumage, and its graceful motions, it may be considered one of the most interesting of our summer visitors. You need not go far from here to observe this bird; in the first or second week in April, if you take a walk round the Castle Bank, you are sure to see him, either on the castle wall or on the trees skirting the foot-path.

THE WOOD WARBLER.

In my previous paper I have already spoken about the Willow Wren and the Chiff Chaff, and now I am going to introduce to you their cousin, if I may term him so, I mean the Wood Warbler (*Sylvia sylvicola*). I may state that these three birds resemble each other so closely in size, habits, and nesting (although their songs are different), that except to the practical ornithologist, they may easily be confounded with each other. In this district you may look out for him about the 27th of April. I never see or

hear him after the middle of August ; so I conjecture he leaves us early in September. This bird is found from Germany, Holland, and France, to Sweden, and also in Morocco. It frequents woods of medium growth in preference to plantations, thickets, copses, and hedgerows, and it loves especially birch and beech woods, where the undergrowth is not so dense. When the males arrive, which they do a few days before the females—a curious circumstance in nearly all our warblers, and one I have never heard satisfactorily accounted for—they mount higher up in the trees than either the Willow Warbler or the Chiff Chaff, and there begin their song. This I cannot describe satisfactorily by words ; its note is very peculiar and shrill, resembling the word “twee” repeated slowly twice or thrice, and then followed by a sort of shake, or hurried repetition of the same tone, accompanied by a vibratory action of the wings, which curiously affects the song. In pairing time you will often hear them tweeing and trilling against each other, to win their dames, as if they would shiver themselves to pieces. They will also stop in the middle of their song, and give forth a strange, sad, melancholy note, to which the late Canon Kingsley thus beautifully alludes in his “Prose Idylls” :—

“Yon Wood Wren has had enough to make him sad, if he only recollects it ; and if he can recollect his road from Morocco hither, he maybe recollects what happened on the road—the long weary journey up the Portuguese coast and through the gap between the Pyrenees and the Jaysquival, and up the Landes of Bordeaux, and across Brittany, flitting by night, and hiding and feeding as he could by day ; and how his mates flew against the lighthouse, and were killed by hundreds ; and how he essayed the British Channel and was blown back, shrivelled up by bitter blasts ; and how he felt, nevertheless, that ‘that wan water he must cross,’ he knew not why ; but something told him that his mother had done so before him, and he was flesh of her flesh, life of her life, and had inherited her ‘instinct,’ as we call hereditary memory, in order to avoid the trouble of finding out what it is and how it comes. A duty was laid on him to go back to the place where he was born, and he must do it ; and now it is done ; and he is weary, and sad, and lonely ; and for aught we know thinking already that when the leaves begin to turn yellow he must go back again over the channel, over the Landes, over the Pyrenees to Morocco once more. Why should he not be sad ? He is a very delicate bird, as both his shape and his note testify. He can hardly keep up the race here in England ; and is accord-

ingly very uncommon, while his two cousins, the Willow Warbler and the Chiff Chaff, who, like him, build, for some mysterious reason, domed nests upon the ground, are stout and busy and numerous everywhere. And what he has gone through may be too much for the poor Wood Wren's nerves, and he gives way; while Willow Wren, Blackcap, and Nightingale, who have gone by the same road and suffered the same dangers, have stoutness of heart enough to throw off the past, and give themselves up to present pleasure. Why not? who knows? There is labour, danger, bereavement, death in nature; and why should not some, at least, of the so-called dumb things know it, and grieve at it as well as we."

It is a pretty sight in early morn, when the sun is glistening on the leaves, to see the Wood Warblers in search of their morning meal. You will see them peering under the leaves, and searching every twig carefully, picking off insects here and there, and sometimes catching them when suspended in the air; at times they will stop in the middle of their song and pick up some small larva. It is pleasant to see them toying with the females, and chasing them right merrily. They are purely insectivorous birds, as far as I have been able to determine. There are always two or three pairs of birds in different parts of the wood, and they seem each to have their allotted stations. They build a domed nest on the ground, sometimes under a bush or tuft of grass, sometimes under a mass of dead leaves; and instances are recorded of them nesting in a low bush, but this has never come under my observation. The nest is always well concealed, and can only be found after a careful search. It is composed of dry grass, moss, dried ferns, and dead leaves; and it differs from the nest of both the Willow Warbler and the Chiff Chaff in being lined with fine grass and hair, instead of being lined profusely with feathers. The eggs number five or six, although seven and eight sometimes occur; I have also seen them sitting with three. They are of a roundish shape, white, spotted all over with a deep reddish-brown, at times with a darker zone round the large end. The Wood Warbler is a beautiful bird, and of an elegant shape. The best places in this district to study the habits of the Wood Warbler are Newbiggin, Dicky Wood, Kingmoor Wood, Orton, wood top of Cowran Cut, Redcat, Brisco, and Wreay. I should like some of our members

to go to some of these places early in May, especially Kingmoor, as it is nearest to hand, to hear for themselves the sad call-note of this bird.

THE TREE PIPIT.

If you take a walk in the country about the 16th of April, you are sure to observe a bird, which, from its song, and the manner in which that song is given, will be sure to attract your attention. I mean the Tree Pipit (*Anthus arboreus*). This bird is found in Denmark, Norway, Sweden, France, Italy, Switzerland, Madiera, and also in Asia and Japan. It winters, I believe, in Africa. In the counties of Cumberland and Westmorland it is plentiful. It resorts to the borders of woods, as well as to orchards, and hedgerows where elm or other trees are planted at intervals; and it is especially found in cultivated and arable districts. On their arrival, the males (which precede the females by a week or ten days) repair to their respective situations and commence their songs of invitation. These strains are often uttered from the topmost twig of some tree where the bird is perched, but I notice that he does not give the full song there, but only when he is on the wing. What a pleasure it is to see him rise up with a simple twitter, and shoot up like a sky-rocket till he has attained a height of forty or fifty feet, and then, poising himself like a Kestrel for a few moments, he will, with motionless extended wings, and erect and expanded tail, descend either to the ground or to the twig he started from, sometimes in a semi-circle to some other tree a little way off, uttering all the time his twee twee twee, twee twee twee-e-e. He is a joyous bird, and will continue his song and aerial flights all day long, especially in the month of May. I have seen it perform the same evolution twenty times in half an hour. If you are in a good locality, you may see half-a-dozen of them ascending, descending, and singing within a short distance of each other. The telegraph wires are also a favourite resort, along the railway embankments. About the middle of July the Tree Pipit is silent as far as his song is concerned, and he only utters a soft call-note, a simple "pit-pit;" he is seldom seen in the trees at this time, and

you will not observe him to soar in his somewhat graceful flights, as he does in the spring- and early summer months. This bird seems to be intermediate between the Wagtails and the true Larks; like the latter, the Pipits have the hind claw elongated, but not to so great an extent. It does not roll in the sand and dust itself like the larks, but thrusts its beak into the water and sprinkles itself, much after the manner of the wagtails; it vibrates its tail also like the latter, and runs along the ground with ease and celerity, searching for insects and their larva, and small seeds, which are its principal food. Its nest, which is placed on the ground, underneath a small bush, or under a tuft of grass, is composed of dried grass and vegetable fibres, and is lined with hair. One I found last year had a regular tunnel to it through the thick undergrowth; if I had not seen the bird run off, it would have been impossible to have found it, as it was the length of my arm through the cover. The eggs number five or six, and they vary so much that I will not attempt to describe them. Mr. Hewitson says:—

“Amongst our land birds, there is no species the eggs of which present so many or such distinct varieties as those of the Tree Pipit. No one would at first believe them to be eggs of the same species; and it was not till I had captured the bird upon each of the varieties, and also received them from Mr. Doubleday, similarly attested, that I felt satisfactorily convinced upon the subject.”

I have found all the known varieties of the eggs of this bird in this county. The female sits very close when incubating, and when she leaves her nest, does so very quietly, running a short distance on the ground before she takes flight. Although this bird seems so ill adapted for long flights, an instance is on record of one having alighted on board a vessel from Liverpool, at a distance of at least thirteen hundred miles from the nearest mainland of South America, and about nine hundred from the wild and barren island of Georgia. The length of this bird is about six inches, and it may be distinguished from the rest of the genus by having the hind claw short and curved.

THE SPOTTED FLYCATCHER.

The Grey or Spotted Flycatcher (*Muscicapa grisola*) is a quiet, unassuming bird, and one which is common nearly everywhere ; it is the last to arrive of all our summer migrants. It is found on the continent of Europe as far north as Norway and Sweden, and it also occurs in Africa, even as far south as the Cape of Good Hope. It generally arrives here on or about May 14th, and it leaves us in the middle of September, but sooner or later, according as the season is less or more favourable to the continuance of the supply of its insect food. It has a number of local names—Cherry Sucker, Cherry Chopper, Beam Bird, Bee Bird, and Post Bird. In some places it is held as sacred as the Robin, and there is an old saying in the country :—

“ If you scare the flycatcher away,
No good luck will with you stay.”

It is a familiar bird ; there is scarcely a country house or suburban garden which has not its pair of Flycatchers. It also frequents woods, plantations, orchards, and low bushy hollows. It is rather a mute bird, and has a faint call-note something like sheetic, sheetic, sheetic tic tic. Some naturalists affirm it has no song, but it has, and it is uttered in such a low tone as to be scarcely heard a little way off, and then but rarely ; it somewhat resembles the song of the Whinchat. This bird is very useful in clearing the orchards and gardens of flies that throng there when the fruit is ripe ; at which times, although actually preserving them from the myriads of insect destroyers, it is often accused of perpetrating the very mischief it does so much to prevent ; from this erroneous opinion has arisen the name Cherry Sucker, applied to the *cherry protector* by those who take every opportunity of destroying it. In summer time, it is very interesting to watch this Flycatcher perched in some prominent position which commands a view all round ; in an instant it may be seen to dart after some fly or insect, often at so great a distance as to be out of our sight, but not to the telescopic eye of this bird, who will capture it and return to his post with great rapidity, ready for another victim : and thus it continues

to do all the day long. Nothing can be more graceful or pretty than the action of these birds in taking their prey. The good work a pair do in clearing a garden of insect pests may be gathered from the following observations of Mr. Denham Weir, who had a pair of these birds which nested in his garden. He watched them carefully, and found that they fed their young no less than five hundred and thirty-seven times in one day, beginning at twenty-five minutes before four o'clock in the morning, and ending at ten minutes before nine in the evening. It is impossible to give the precise number of flies that might have been consumed by their brood, as they sometimes brought to them one large fly, at other times two, three, four, five, and even more flies of different sizes. After their arrival they do not lose much time in preparing for their future progeny; indeed, they have been known to complete their nest in one day and a half. The nest is built of moss, dried grass, and straw, and is lined with hair and feathers, and sometimes with cobwebs. The number of eggs is five; they are of a bluish-white colour, clouded and spotted with light brownish-red, generally darker at the larger end; some of them resemble the eggs of the Robin, only a shade smaller. They build in the hole of a wall, or of a tree, on the ledges of outbuildings, between the branch and the trunk of the stately oak, elm, beech, and various other trees, in ivy, or in woodbine climbing up a porch, on the head of a garden rake set up against a wall, in ornamental stone-work in gardens; one I knew built for many years on the window-sill, another in a doorway through which people were constantly passing, and would not leave its nest until just within reach of the hand; one in a rose-bush against a cottage wall, which would actually let the inmates touch it while sitting on the nest; another pair built in a bird-cage hung against a tree in an orchard. A Song Thrush built a nest on a hanging bough of a spruce fir, where she hatched and brought up four young ones; on examining the apparently-deserted nest a month later, we found that a Flycatcher had built a beautiful nest inside, where she was sitting on four eggs. I have known these birds, after they had brought up their first brood successfully, build another nest on the top of the previous one,

and hatch their second. One that had built its nest in a pear-tree against a garden wall, has been known to try to conceal it by drawing the leaves of the tree over it. But the most curious instances of caprice in this matter, are those of two pairs of birds which selected street lamp-posts for the purposes of nidification. One of these is mentioned by Atkinson as having occurred at Leeds; the nest was built in the angle of a lamp-post, and the parents succeeded in rearing their young. In the other instance, the nest was made in the ornamental crown on the top of one of the lamps in Portland Place; it contained five eggs, which had been sat upon; and Mr. Yarrel states that he saw the nest in its curious receptacle at the Office of Woods and Forests. In "Science Gossip," a gentleman mentions a pair of Spotted Flycatchers who built their nest on the capital of a column supporting the portico of his house. He and his family had been much interested in watching the proceedings of these pretty and interesting birds. Judge of his dismay, when sitting out under a tree near, he observed the hen bird and the nest descend to earth and both execute marvellous gyrations thereon. His son easily caught the bird, with nest attached, when the cause of this domestic calamity became manifest. A woman has been, by misogynous old bachelors, said to be at the bottom of all mischief. It proved so in this case, for having used a woman's long hair in the construction of her nest, the little bird had got its head and neck through a loop of the said hair, and, on attempting to leave her nest, had brought both herself and it and the five eggs to grief. I could fill a volume with anecdotes of this bird, but will conclude with a charming instance of parental affection displayed by a pair of Spotted Flycatchers. A pair of these little birds had one year inadvertently built their nest on a naked bough, perhaps in a shady time, not being aware of the inconvenience that followed; but a hot sunny season coming on before the brood was half-fledged, the reflection of the wall became insupportable, and must inevitably have destroyed the tender young, had not affection suggested an expedient, and prompted the parent birds to hover over the nest all the hotter hours, while, with wings expanded and mouths

gaping for breath, they screened off the heat from their suffering offspring.

And now, I hope what I have said about these birds, may lead you all to protect and cherish these pretty, interesting, and useful creatures. The music of birds is grateful to the ear; to listen to a thousand warblers enjoying happy freedom in their native woodlands, is, I am sure, to some people most delightful. Birds make part and parcel of the country—they form, so to speak, one of the ingredients in it; they are among the objects that appeal agreeably to our senses. Who does not arrest his footsteps to listen to the trill of the soaring lark, or to the delightful strains of the Thrush, the Blackbird, or the Blackcap Warbler? We feel that the country would lose one of its greatest charms, were it not resonant with their melody. Each grove and shrubbery, each bosky dell from side to side, each heath and upland common, each hedge and garden and petty rural homestead, receives some of these wandering minstrels; and if I could only impress upon some of you, to seek to know each note and song of these tiny visitants, and distinguish the form and plumage of each songster, my labour will not have been in vain.

WILD FLOWERS AROUND CARLISLE. PART II.

BY W. DUCKWORTH.

(Read at Carlisle, 1884.)

LAST year I finished the first part of this paper with the Heaths, ERICACEÆ, ending with the Winter Green, *Pryola media*. The three orders following this contain trees and shrubs only, and therefore have nothing to do with the present paper. The trees around Carlisle would be a very good subject for some future paper, if anyone will take it up. I hope some one of our members will act on this suggestion.

The first flowers we have to deal with to-night are the Periwinkles, order APOCYNACEÆ. Neither the Lesser, *Vinca minor*, nor the Greater, *V. major*, are indigenous to this part of the country, and therefore we generally find them about gardens and pleasure grounds; often in a seemingly wild state, though I think such is never really the case.

The GENTIANACEÆ, as far as my knowledge goes, are only represented by two genera. In the first, *Erythræa*, by *E. centaurium*, a plant much sought after by our cottage doctors. Its pretty tufts of pink flowers are open only during dry weather, and even then they close about three o'clock in the afternoon. It varies much in its growth, dependent upon the situation: on the Scar, where there is much undergrowth, it grows to two feet in height, while in some of the pastures about Stainton it reaches only three or four inches. In the next genus, *Menyanthes*, we have but one flower, and that the Bog Bean, *M. trifoliota*, considered by many to be

the most beautiful wild flower we have. Its bearded pink- and white flowers, standing straight up from the mossy pool, matted with their thick and floating rootstock, have an appearance that when once seen is not easily forgotten. Only this summer, while on one of our local mosses, during the nesting-time of the Black-headed Gull, I counted on these floating rootstocks of the Bog Bean, many of them thicker than my thumb, and in a pool not half the size of this room, thirteen nests of the above bird, each nest containing its complement of three eggs. Many pieces of rootstock were floating about, and were cut as clean as with a knife, by the bills of these Gulls, to form cross-pieces for the foundation of their nests. Of the properties of the Bog Bean I might enlarge for some time; it is greatly used in many places for rheumatism; it has often been used in imparting a bitter flavour to beer, in place of hops; for tanning purposes, etc. I know one man who goes every year to Cumwhitton Moss to gather it, for medicinal purposes. The nearest place to Carlisle where it may be found is a wood behind the Asylum.

The Jacob's Ladder, order POLEMONIACEÆ, *P. cœruleum*, I have not found wild; with us it is a garden plant.

The order CONVOLVULACEÆ furnishes us with two species, *Convolvulus arvensis* and *C. sepium*. The former of these two plants might have been seen this year growing plentifully among the nettles on the Castle Bank, though it is generally an inhabitant of cornfields. The Great Bindweed hangs out its large but fragile bells from many a hedge and thicket. Almost anywhere on the banks of the Eden, where there is a luxuriant wild-growth, you will find it, here gathering together a few twigs of willows, or tufts of grass; there twining its way up to the light by the help of the Giant Groundsel or the Meadow Rue, making, as it were, step-ladders of much stronger-stemmed plants than itself. Thus, by what Dr. Taylor calls "woodcraft," it hangs out its white blossoms to sun and breeze and insect, in order, not only to preserve its place among other wild flowers, but also by the maturing of its seeds to spread its species further abroad. Of the parasitic genus in this

order, the Dodder, *Cuscuta*, I have not been able to find any species near us.

Of the SOLANACEÆ we have the *Hyoscyamus niger*, which occasionally occurs on waste ground ; Dalston Green and other places are given as localities for it ; last year it was found near Corby. The *S. nigrum* I know of only as a casual in a garden at Stanwix. *S. dulcamara* is common about the hedges around Kingmoor, on Stainton Banks, etc.; and in autumn its pretty clusters of red egg-shaped berries look very tempting, especially to children, who ought to be taught not to eat any wild fruit or fungi without first knowing what it is. The other remaining plant in this order, *Atropa belladonna*, does not occur near Carlisle.

The SCROPHULARIACEÆ include many well-known wild flowers. In the first genus, *Verbascum*, we have one well known plant often found in gardens, *V. thapsus*, which may be found growing wild near Dalston ; I have also found it on Beaumont Banks. It is easily recognised by its thick flannel-like leaves and its tall spike of yellow flowers, which only open a few at a time. We have many of the *Veronicas*, or Speedwells, with us ; one of them especially is well known, the Germander Speedwell, *V. chamædryis*, often miscalled Forget-me-not, but still better known as Birds-eye. It may be found on all our hedge banks. Others not so well known, as *V. serpyllifolia*, may be found near Carleton, and several other places ; *V. scutellata*, by the side of Monkhill Lough ; *V. anagallis*, in a ditch which runs across Kingmoor ; *V. beccabunga*, with its pretty blue flowers, in almost all our ditches and water-courses ; *V. officinalis*, commonly distributed ; *V. hederifolia*, on the Old Brampton Road, just past Stanwix villa ; *V. buxbaumii*, in many places—near Dalston, St. Ann's, etc. This last plant, on a heap of stones just past St. Ann's, flowered through all last winter. In spring it died, and I have not seen it since on the same place. This plant is an alien, now become a colonist. Of the *Bartsias* we have only one, *B. odontites*, a late-flowering plant, which may be found by any of our roadsides at the end of summer. *Euphrasia officinalis* is a common meadow- and heath plant with

us; it often varies considerably in its colors, from white to red. I think it is old Culpepper who says of this plant, that "if its virtues were as much sought after and cultivated as they are neglected there would be no work for spectacle makers." There are many legends associated with the Eyebright, too many in fact to quote here; but one which my brother and I heard one Saturday night, while making our way to the Museum, is perhaps worth repeating. A quack, having his stand at the entrance to the Sands, was detailing to his audience the powers of herbs, "and their true qualities" over every other medicine invented. Thus he spoke:—"Does a dog when it is ill go to a druggist's shop, to get poisoned? No! it goes to the green fields, and there picks out for itself a certain grass, which it eats and makes itself sick, thus getting rid of the bad humours of the stomach. And so with other animals. Do the birds go to a druggist's shop? No! the very herb that I hold in my hand is noted, and has been from time immemorial, for curing diseases of the eye! The lark, when its nestling gets its eye pricked with a thorn (he did not say how), goes in search of this herb, perhaps having to fly miles and miles before it finds what it is in search of. When it has found this herb, this *Euphrasia*, it brings a piece carefully to its nest in its beak, and there it chews and chews it up till it is a perfect pulp, and then applies it to the injured eye of its nestling, which in a short time heals, and it regains its wonted sight." When we left, he was selling his pills and potions as fast as he could hand them out. *Rhinanthus crista-galli* is too common in most of our meadows; by some its presence is considered a sign of bad land, by others, a sign of bad husbandry. I believe it is partially parasitic on some of the roots of the grasses. It is easily known by its bladder-like capsule, in which the seeds when ripe make a distinct rattle when shaken. As it ripens before the other meadow plants are fit for the scythe, it has therefore little chance of being exterminated. The Yellow Cow-wheat, *Melampyrum pratense*, may be found in Wetheral Woods. The Field Lousewort, *Pedicularis sylvatica*, with its finely-cut leaves, looking almost like a fern, is found on Kingmoor, and a white variety at Corby quarries. *P. palustris*, a

plant of much larger growth, near Blackwell. The Knotted Figwort, *Scrophularia nodosa*, often known as Stinking Roger, is common by most of our river-sides. *S. aquatica* is much the rarer plant with us, and I have only seen it in three places—Scaleby meadows, the Scar, and the Cherm Wood, near Cargo. It may be easily distinguished from the other by its winged stem, and by the absence of tubers at the root. On the Scar this summer (1884), we had plants which measured nine feet in height—five feet more than what Hooker gives. *Digitalis purpurea* is common in many places, but seems to be somewhat local in its distribution, as sometimes in a day's walk you will not see a single plant. I remember walking last year from the Alston branch of the North Eastern Railway to Brampton along what, I think, is known as the Black Fell side, and not a single plant of Foxglove did I see till I got to Farlam, and there they were very much dwarfed. I am not geologist enough to say, but I think that there I must have crossed from one geological formation to another. In the Toadflaxes we are only represented by two species. *Linaria cymbalaria*, commonly known as Aaron's Beard or Wandering Sailor, is considered by many authors as not really indigenous, though when it was first established is not certainly known. It may often be seen festooning old walls, as at Carleton, St. Ann's, etc. The finest plants I ever saw are growing on the walls of Scaleby Castle. It is often a favourite window-plant in cottages, being grown in a hanging pot. The Common Toadflax, *L. vulgaris*, the Butter and Eggs of country children, may often be found on railway banks and waste ground; it grows near the Caledonian Railway Sheds, and in the Stainton lanes. The Mudwort, *Limosella aquatica*, is found at Newby and Thurstonfield. *Mimulus luteus*, known as the Monkey Flower, though naturalised in many parts of Cumberland and Westmorland, does not occur near Carlisle, except as a garden flower.

In the Broomrapes, order OROBANCHACEÆ, we are not represented, unless I stretch a point, and include that very curious parasite the Toothwort, *Lathræa squamaria*, which has been found near Low House, the nearest point I know of to Carlisle.

Here it grows on the roots of the Horse Chesnut, a fact which is not mentioned in any of my botanical works ; it is generally found on the roots of the Elm and the Hazel. Last Easter I found it very abundant about Lowther on both these trees.

Verbena officinalis was found some time ago growing about Knowefield, and was put under cultivation, where it still may be seen.

We now come to another large order of British plants, the LABIATÆ, flowers with a lip ; and according to the new lights under which botany is being studied, these lips are evolved or developed in order to make a resting-place for insects while robbing the flower of its honey ; while so doing the insects take the pollen as well as the honey, and carrying it to another flower, they thus fulfil their duty as cross fertilizers. In many of the plants these lips are marked with dots and streaks of darker shades of the same colour as the rest of the corolla, in others with a different colour, which act as honey guides to their welcome visitors. *Lycopus europæus* may be found at the Black Dub, a little above Holme Head ; and also in a wood behind the Asylum. Several species of Mint, *Mentha*, are common with us. *Thymus serpyllum* on sandy soils ; *Origanum vulgare*, on the Scar and on Skew Banks ; *Calamintha acinos* I saw growing pretty freely in the grounds at Englethwaite on our visit there, it also occurs on the banks of the Midland Railway a little higher up. *Ajuga reptans* is not uncommon, and I have found a white variety in Wetheral Woods ; white varieties of flowers are now regarded as cases of reversion to an older type. *Teucrium scorodonia* occurs at Primrose Banks, Skew Banks, etc. I remember some years ago seeing a lot of people at Wetheral with armfuls of this "yarb." They were from some part of Lancashire. Of the Dead Nettles, *Lamium*, we have several ; the very beautiful *L. galeobdolon*, I know of in only one place, between Wetheral and Warwick. A writer in "Science Gossip" some time ago claimed Yorkshire as the most northern limit for this flower ; but I claimed for Cumberland, going a point still further north. *L. maculatum* occurs at

several places—Wetheral, Hesket, Grinsdale, &c., but always, I think, as a garden-escape. It is easily known by its fine purple flowers and its leaves streaked with white. *L. purpureum*, or Bad Man's Posy of the children, is everywhere; a white variety in Barras Lonning, Dalston. *L. album*, on the banks of the Eden near Linstock. *L. incisum* is found at Blackwell. Of the Hemp Nettles, *Galeopsis*, I think we have only two: one is *G. tetrahit*, which is to be met with everywhere, and whose flowers vary in all shades between purple and white. The nearest place I have found *G. versicolor* is Cargo; though it is very common a little further north. This has a very handsome yellow and purple flower, and it might well be introduced into our gardens as an annual. In the Woundworts, *Stachys*, we have one plant, which is greatly in use among herbalists, *S. betonica*, and not without reason I think, judging by what I have heard of its properties from disinterested persons. Used regularly it is almost a certain cure for nervous headaches. Its fame is not confined to our country; the Italians have a proverb which says, "Sell your shirt, but buy betony." Two other Woundworts are common with us, *S. sylvatica* and *S. palustris*; a hybrid between the two, *ambigua*, was found this year at Dalston. *S. arvensis* occurs near Blackwell. *Nepeta glechoma*, a little creeping plant with a strong aromatic smell, grows on many of our hedge sides. This has many old-fashioned names, such as Gill-run-along-the-ground, from its habit; Alehoof, from its being used to impart a bitter flavour to that and other beverages. *Marrubium vulgare* is found at Dalston. *Prunella vulgaris* is very common, and is a plant which often retrogrades, as white varieties are not uncommon. *Scutellaria galericulata*, a rare plant with us, is found near William's Wood.

The next order, BORAGINACEÆ, includes the Scorpion Grasses or Forget-me-nots, though really to only one of them, *Myosotis palustris*, does this name belong. It is common by most of our streams. *M. cæspitosa* may be found on the Scar; *M. collina*, near Corby; *M. versicolor*, on the Kingmoor road. *Lithospermum arvense*, at Cummersdale. One of the fields belonging to the Corporation is called Grumwell Meadow, possibly being named

after the common form of this plant, which in old herbals is spelled Gromvel. *Symphytum officinale*, a plant much used now in many places for cattle-feeding purposes, may be found with white flowers by the side of the Eden, near Linstock; while the purple-flowered one has been found near the Cross Roads, Harker. *Borago officinalis*, a plant in great request at one time for many purposes, occurs about Rockcliffe, Dalston, and Stanwix. Its leaves are still used in the making of "claret cup," and for other inviting drinks; but I cannot hear of its being used as a salad now; it is a very useful plant to bee-keepers, and ought to be carefully cultivated by them. *Lycopsis arvensis*, a small hispid plant with blue flowers, is not uncommon in many of our cornfields, and it often occurs round Stainton. *Cynoglossum officinale* grows somewhat commonly about Dalston Green, and the colour of its flowers, dark claret, is almost unique among wild flowers. The Dusky Cranesbill, *Geranium phœum*, is something like it, but darker. Its properties are both narcotic and astringent, and the name is said to be derived from the resemblance of the rough texture of the leaves to a hound's tongue. Legend saith the leaf ties the tongues of hounds—how, I cannot tell you. *Pulmonaria officinalis* grows with us only as a garden escape, and I think is not really a native, Its former use in lung complaints was due, I believe, to the principle of "like curing like," the spotted leaves resembling in appearance an animal's lungs. *Echium vulgare* is common enough about the docks at Silloth, but is rare with us. I have seen it in the neighbourhood of the Stony Holme.

Belonging to the next order, LENTIBULARIACEÆ, is the Butterwort, *Pinguicula vulgaris*, a not-uncommon bog plant. I met with it on Kingmoor some three or four years ago; but have not seen it since. It may be found on Harker and Todhills mosses, and is easily recognised by its rosette of pale yellow leaves, lying close to the ground, and by its single purple flower, on a stem ranging between three and six inches high, resembling in appearance a half-closed violet. It is an insectivorous plant; but its mode of catching is quite different from our other two noted insect-catchers. It has no glands nor tentacles like the Sundew; no trap like the

Bladderwort; but the edges of the leaf are simply enrolled. Hapless insects creeping under these for any purpose whatever—food or shelter—find too surely that they cannot get out, as the edges of the leaves close upon them. The Bladderwort, *Utricularia*, I have not been able to find in this district; though I still hope to do so some day, as we have some places very likely for it.

The next order, PRIMULACEÆ, contains some favourite flowers; though one of them, the Primrose, *Primula vulgaris*, I am sorry to say, is fast disappearing from the neighbourhood of our city; it still leaves its trace in the “Primrose” Banks around us, Primrose only in name now. The Primrose has adapted itself admirably for the purposes of cross fertilization; a study of pin centres and rose centres, as they are called by gardeners, will well repay all the attention that is given to them. The Cowslip, *P. veris*, is very abundant in many of the holms by the side of the Eden; and in situations where the Primrose and the Cowslip meet, may often be found hybrids between the two, called Oxlips; though not the real Oxlip, *P. elatior*, of botanists, which grows only in one or two of the S.E. counties of England. Of Loosestrifes, *Lysimachia*, we have but one, *L. nemorum*, which grows freely about Wetheral and Corby Woods. *Anagallis arvensis*, or Poor Man’s Weather Glass, is not uncommon in the fields about Kingmoor. This gets one of its names from always closing its petals before rain; I at least know of one instance where it did not do so; but the exception might prove the rule. *Glaux maritima* grows on Rockcliffe Green.

In the next order, PLUMBAGINACEÆ, *Armeria maritima* grows in profusion on Rockcliffe Marsh, and to see acres of it in bloom at once is a sight worth seeing. We have the whole of the Plantains, *Plantago*, and in a walk from say, Stanwix to Rockcliffe, you might find them. *P. major* and *P. lanceolata*, are common everywhere; *P. media*, on Stainton Banks, and all down by the side of the Eden. *P. coronopus* and *P. maritima*, on Rockcliffe Green and Marsh. On our excursion to Caldbeck we found this last plant growing very fine on Warnell Fell.

In the next orders, CHENOPODIACEÆ and POLYGONACEÆ, are

included the Goosefoots, Oraches, the Persicarias, the Docks, etc.; plants, nearly all of which have small and inconspicuous flowers. The best known of the *Chenopodiums* is the Mercury Goosefoot, or Good King Henry, *C. bonus henricus*—why called after King Henry I know not, unless he was a lover of herb-puddings, of which it forms an important ingredient, in company with our next plant, Common Bistort, or Snakeweed, *Polygonum bistorta*, better known as Eastermer Giants and Easter Ledgers. Good King Henry is generally found in the neighbourhood of villages and farm-houses. Stainton produces some fine specimens of it; while some parts of the Caledonian Railway banks are covered with Eastermer Giants. *P. amphibium*, as its name implies, may be found by the sides of ponds, as well as in them, and may be at once known by its conspicuous head of pink flowers. It grows in several still places on the Eden, and is not uncommon by most of our sluggish streams and standing waters. Other *Persicarias* we have, such as the *P. lapathifolium*, *P. persicaria*, *P. hydropiper*. In the Docks, *Rumex*, we have among others the *R. sanguineus* at Thurstonfield, *R. hydrolapathum* at Moss Pool, Sour Dockins, of the children, *R. acetosa*, in all our meadows.

Passing by several orders now, of which I have nothing to say, we come to the Spurges, *Euphorbiaceæ*, in which we are very thinly represented, *E. helioscopia* is common in all kitchen gardens. It exudes an acrid white fluid on being broken, which is supposed to be efficacious in curing warts. *Mercurialis perennis*, an early spring plant, is common in all our damp woods.

In the Nettle order, *Urticaceæ*, we are pretty strong, both *U. urens* and *U. dioica* being common with us; the latter being the one which is still largely used for Nettle broth and Nettle beer, and which Andrew Fairservice, in "Rob Roy," forced for his "spring kail." *Parietaria officinalis*, easily known by its red stems, dark green ovate leaves, and small greenish flowers in axillary clusters, may be found by the Wetheral caves; no doubt left there by some of the ancient Benedictine monks, as it was a plant in great request for medicinal uses, and is chiefly to be found by old

churches. I have seen it on Cartmell Church, Holme Cultram, etc. It has the property of assimilating nitre, of which it contains a great quantity, hence its requisition as a "sovereign herbe." Some time ago, I was requested by a literary gentleman in Carlisle to quote him the passage in Shakespeare in which this plant was mentioned, a clergyman on whose church walls it grew having pointed it out to him as a Shakesperian plant. However, it is not mentioned by Shakespeare. The Hop, *Humulus lupulus*, is to be found on the Scar, at Carleton, etc.; generally the female plant; the male I have seen only once, and that was at Dalston Green.

Passing by four or five orders which contain trees and shrubs, we come to those very highly-specialized flowers, the Orchids, ORCHIDACEÆ. The means adopted by these flowers to secure fertilization are amongst the most wonderful in plant life; for an account of these I must refer you to the works of Darwin, Müller, Grant Allen, etc. In the Twayblades, *Listera*, *L. ovata* may be met with in many places here. The finest plants I have seen grew in a little plantation on the Longtown road not far from Greymoor Hill. Here I have found the plant with one, two, or three leaves. *Epipactis latifolia* grows by the side of the river Caldew, near Holm Hill. An old station for *Cephalanthera ensifolia* has been rediscovered this year by Mr. Shepherd, near Talkin. In the genus *Orchis*, we have first *O. mascula*, which is common in many of our woods and meadows. This plant is known by several curious names, such as Cain and Abel, Adam and Eve, etc. One singular practice in connection with this plant is to dig up its tubers and to throw them into the water, when one sinks and the other swims; but whether it is Adam that sinks and Eve that swims, or *vice versa*, I am not in a position to say. *O. ustulata* occurs on Stainton banks; where also may be found *O. maculata*, and also *Gymnadenia conopsea*, which is also to be found on Dalston Green. *Habenaria bifolia* is common on Kingmoor.

In the next order, the IRIDACEÆ, I have but one plant to mention, the Yellow Flag, *Iris pseudacorus*, which is not uncommon

in wet places by river sides, near Carleton, Beaumont Banks, etc. The rhizome or creeping underground stem, is regarded in many parts of the Highlands as a sure cure for toothache.

On the Skew Banks used to be found (I could not find it this year,) that very favourite flower the Daffodil, *Narcissus pseudo-narcissus*; the nearest place to Carlisle where one might say it was growing really wild. Belonging to the same order, AMARYLLIDACEÆ, is the Snowdrop, *Galanthus nivalis*, which is found growing wild by the side of the Caldew, at Cargo Beck, and near Moorhouse.

In the order LILIACEÆ. we have several of the onion or garlic family. The Sand Garlic, *Allium scorodoprasum*, peculiar to the north of England, I found last year on the Scar; this year, on the banks of the Eden, near Linstock. *A. vineale* is common on Stainton Banks, and might be found this year at the entrance to Kingmoor. *A. ursinum*, Ransoms, or Ramps, is common in many places by the sides of the Eden, the Petterill, and the Caldew. I am informed by Mr. Hands that *Gagea lutea*, a rare plant, was found by one of the Grammar School boys near Wetheral. *Hya-cinthus nonscriptus* is plentiful in Spa Well Wood, and other places. Many a racy controversy has taken place about this plant, whether it or another, the *Campanula rotundifolia*, has the proper title to be called the Harebell; and enough has been written at one time and another to form a separate paper at some future meeting; it is too long to go into here. *Polygonatum multiflorum* occurs in Newby Woods.

Paris quadrifolia grows in Wreay and Peastree Woods. It is often found with five or six leaves instead of the usual four; and this year, in company with Mr. Hodgson, we found near Lowther a plant with seven, the largest number I think which is known.

Colchicum, or Meadow Saffron, I once found some years ago on the railway banks between Kirkandrews and Burgh.

In the following order, HYDROCHARIDACEÆ, we have but one plant generally known, *Anacharis alsinastrum*, which has caused a good deal of excitement in its day. It first appeared in Ireland in 1836, then in Scotland in 1841 or 1842, and about the same

time in England, in the Grand Junction Canal, near Market Harborough; afterwards in nearly every stream in the country. Dire were the prognostications about it: soon would all our lakes be a mass of green weed through which no boat could be pulled; our rivers choked with it, and our ponds but mud-holes. Like many another Yankee scare, it has had its day. Though I believe the sports on Talkin Tarn were stopped through it one year, if not more. I remember in February, 1873, coming round by the north end of the tarn, where there was a bank of this weed, blown up by a severe gale some time before, six or seven feet high, and ten or eleven broad at the base.

In the ALISMACEÆ, *Alisma plantago* is common in the ditches about Kingmoor, Rickerby, etc., and *A. ranunculoides* in Monkhill Lough. The very handsome and stately *Butomus umbellatus*, is found in Brunstock Beck, and *Triglochin palustre* grows at Cummersdale.

The various species of Pondweeds have not yet been worked out, though I expect we shall be pretty strong in them from what I already know. Belonging to the order ARACEÆ is *Arum maculatum*, which grows on Davidson's Banks, and not again, I think, till you come near Wetheral. In Westmorland I have seen children using the purple spadix for ear-rings. The most curious thing about the *Arum* is the method adopted by it to ensure crossing. At the point where the spathe is constricted, there is a ring of hairs so arranged that insects can creep into the hollow below, but can't get out again until these hairs wither, which they do when the pollen is ripe and discharged from the anthers. These insects get dusted with the pollen, and then are allowed to go, carrying the pollen to other flowers, whose pistils are ready to receive it; if fertilization takes place. *Acorus calamus* is found in only one place that I know in this district—Stonebriggles. *Sparganium ramosum* and *S. simplex* are common in many pools. *Typha latifolia* is found at Moss Pool, and near Cotehill.

The last wild flower I have anything to say about belongs to the JUNCACEÆ, and a very pretty and sweet-scented one it is, the

bright golden yellow of its racemose flowers, with their deep orange anthers, give it a most charming appearance when set off by dark pools of peaty water. The perfume—which is not constant, but given off occasionally—is exactly like the *Stephonitis*.

What reminiscences have been brought to my mind while writing these notes on the wild flowers! This last plant, the Bog Asphodel, *Narthecium ossifragum*, calls up to me a bright May day spent on a border moss. The keeper and I had been examining some scores of nests of the Blackheaded and the Lesser Blackheaded Gulls, and having got through from one end of the breeding-ground to the other, we sat down to eat our lunch, with our feet in a ditch and our backs against a pile of turf. The incessant cries of the gulls we had disturbed in their work of incubation, was something terrible. But after we had sat some time, and a pipe had followed the lunch, while anecdote after anecdote anent the wild life on a border moss, fell from the keeper's lips;—the gulls which were sitting began to settle on their nests, Blackheads in the near distance and then from right to left over a wide expanse of ground Blackbacks; further away, Blackheads again. It was interesting to see, as each female gull settled herself on to her nest; some dropping right on to it, others alighting at some distance and walking quietly to it; the male bird taking his position on some hillock a short distance away, and standing bolt upright—a sentinel on duty; sometimes two or three on the same hillock. These hillocks were worn quite smooth and bare with the use made of them. While this most interesting scene was going on, the keeper asked if I could tell him the name of a flower which grew later on by the sides of the ditch we were sitting in, and which had such a sweet smell. This I at once made out to be the Bog Asphodel; the grass-like leaves were then showing about an inch high. So I never see the Bog Asphodel without seeing the gulls as well.

In conclusion, I wish to say that we have commenced a collection of plants for the Museum, and should be very glad if any members will help us in the matter. It is rather hard when it is left to one or two to do it. Already between three and four hundred

plants have been collected, dried, and mounted, and will be placed in the Museum by the time it is opened in spring. A London Catalogue of British Plants will be kept, and the plants ticked off as they are added, so that any one can see exactly what is wanted. Informal meetings are held in the Museum every Saturday night, at eight o'clock, by a few members interested in Ornithology and Botany, and any members with information to give, or who want information on these subjects, will be gladly received.



THE ORIENTATION OF ANCIENT CHURCHES.

BY GEORGE WATSON.

*(Read at Penrith.)**

THE subject of this paper—the placing of Churches East and West—may be thought by some persons not worth enquiring into; and I am ready to admit that, so far as modern utilitarian ideas go, they may be right. But surely when we find a custom religiously adhered to all over Christendom from the earliest times, and in our own country observed with especial reverence, we ought to consider it worth at least a brief investigation. In Italy we are told there are many exceptions to the general rule of orientation, originating, it is supposed, in the early christians taking the basilicas and other public halls into use as places of worship, not deeming their non-orientation any serious objection.

When, however, old pagan temples were converted into churches, or churches built upon their sites, the east and west position would, for the most part, be found already fixed. Vitruvius, the father of architectural literature, who, about the time of Christ, wrote what is to this day the text-book of classical architecture, says, “If nothing prevent, the temple should be so arranged that the image may look towards the west;” consequently the worshippers would look to the east.

There is, however, a general opinion amongst men of research that we should go still further back in time for the origin of the reverence for the eastern point of the heavens, and find it in

* Inserted under Rule 8.

ancient sun-worship. However that may be, it is certain that the early christians accepted the principle of orientation as a matter of course.

The first mention of the word church, as applied to a place of worship, is said to occur in the fourth century; in the "Apostolical Constitutions" of that century it is ordered, "Let the church be oblong, turned towards the east, with lateral chambers on both sides, towards the east, as it is to resemble a ship: let the bishop's throne be in the midst, with the presbytery sitting on either side and the deacons standing by."

The oblong form, allegorical of a ship, as an emblem of the "Ark of Christ," is said, with great show of reason, to give us the origin of our word *nave*, as applied to the body of a church, the original word in Latin being *navis*—a ship. A church in Rome built A.D. 630, is said to have had its sides curved like the hull of a ship.

In A.D. 390 St. Augustine wrote, "When we offer up prayer we turn to the east, whence cometh the light." These words no doubt have primarily christian reference, but they would appear to refer also to the extinct sun-worship of the eastern nations. And here in England it is also believed by many that it is to the sun-worship of our forefathers, whether as Druids, as converts to Roman pantheism, or as Scandinavian pagans, that we owe the deep-rooted veneration for the eastern aspect in church-building and ritual.

While the pious Hebrew saw in the glorious sun rising "like a giant to run his course," only the most magnificent of God's created agencies, our rude forefathers saw a god himself; and it was but natural that sun-worship should be a leading feature in the religion of the dwellers in the cold north, for to them the sun's genial influence was of the utmost importance; and no wonder that they should worship the most glorious and beneficent object with which they were acquainted, and we suppose that a special time for their adoration was when after a night of coldness and gloom the bright orb again showed himself upon the horizon.

It is recorded that at the winter solstice, when it appeared as

if the sun were leaving the earth to an icy death, there were twelve days sacrifice to induce him to return; and the solstice being passed, they lit up their yule fires and rejoiced over his welcome return. These fire rejoicings, like other old pagan customs, were seized upon by the early teachers of christianity and turned into christian customs, that being an easier expedient than their total annihilation. In this way the sun-worshippers' yule-fire became a christian festivity with a new signification attached to it. The Saxons, we also know, dedicated one day in the week to the sun, and we know it still as *Sunday*.

It is a curious reflection that when we speak of yule-tide, or put on the Christmas yule-log, when we call the christians' day of worship *Sunday*, and when we take our places in church with our faces towards the east, we unconsciously perpetuate reminiscences of that old world sun-worship which moved to righteous indignation the prophet Ezekiel when in his vision he saw apostate Hebrews who had "turned their backs towards the temple of the Lord and their faces towards the east, and worshipped the sun towards the east."

The policy of adopting pagan customs and christianizing them was, the Venerable Bede tells us, ordered by Pope Gregory the Great, when he sent his forty missionary priests to convert the Anglo Saxons. "Idol temples," he ordered, "are not to be destroyed, but only the idols which are in them; let the fanes be sprinkled with holy water and the altars consecrated by relics. If these edifices be well built, it is desirable that they should be converted from the worship of demons to the use of the true God; and since the people are accustomed to slay oxen in sacrifice to their gods, let this be turned into a christian solemnity; so that on the day of dedicating a church, or on the festivals of the holy martyrs whose relics may be there preserved, booths of green boughs may be erected round these same churches, and christian rites be celebrated. By retaining these outward forms of rejoicing you will more easily bring the people to participate in spiritual joys."

Here we evidently come upon the origin of "Chapel Sundays,"

“Rush-bearings,” and other annual village feasts, hardly quite extinct even now.

Under such a policy as that of Gregory the Great, no wonder that the old veneration for the east as the point to which prayer should be directed should not only be allowed, but in accordance with the same feeling coming from the Latin churches, be firmly established, and the principle of orientation become universal.

We sometimes hear the opinion hazarded that it is to the Crusaders' veneration for the east, as the position of Jerusalem, we owe the eastward position of churches; we have seen, however, that the principle of orientation was fixed centuries before the Crusades took place. Besides, Jerusalem is not east, but south-east, of England; and the famous Temple Church in London built by the Knights Templars, does not point south-east to Jerusalem, but is set ten degrees north of the true east; clearly proving that the Knights Templars did not regard the geographical eastward position of Jerusalem in placing their church, but set it to the typical east, as indicated by the rising sun.

In the building of a superior class of churches—whether these were monastic, cathedral, or parochial—the highest constructive talent was employed, and that was found amongst the various lodges of Freemasons. Freemasonry then was by no means identical with the society bearing that name at the present time; the old freemasons were the hard thinkers and workers of their time; with them lay the mysteries and secrets of constructive art, which they guarded with the most vigilant care from the uninitiated. I have no doubt, however, that these secrets related principally to only such technical knowledge of science and art as any studious youth, any builder's apprentice, may now acquire if he is so disposed.

That one of the freemason's secrets was the knowledge of how to fix the true eastern orientation of a church, may, I think, be inferred from the fact that generally the superior churches are set as near as may be true east. It may also be inferred from a curious event well authenticated, that in the eleventh century a certain Bishop of Utrecht was killed by the father of a young freemason from whom the prelate had extracted “the mystery of laying

the foundations of a church ;” the mystery is termed “*arcanum magisterium*,” which appears to indicate that it was a secret known only to the master of the lodge. Now, one cannot well imagine that there could be any secret of a constructional nature about the foundations of a church that it would be possible to keep from the eye of the uninitiated, and I think we may fairly infer that the revealed mystery was the art of determining the true eastern orientation ; if so, it was a miserable bit of knowledge to cost the life of a bishop. While, however, large and important churches are generally found to be set as near as may be due east, ordinary parish churches are found to have a great variety of orientations. A group of eighty-seven churches in Cumberland and Westmorland, the bearings of which I have ascertained with sufficient accuracy for the purpose from the Ordnance maps, range from 12° south to 40° north of the true or equinoctial east. The group comprises only ancient fabrics, or churches, known or believed to be re-built upon the lines of an original church. St. Andrew’s, Penrith, is a case in point ; for though, unhappily, no vestige of stone or record of pen or pencil is left to tell what old St. Andrew’s was like, its noble old tower remains to certify that in the present fabric the original orientation has been preserved.

The accompanying table shows the great variety of orientations in the group of churches ; and to account for the diversity, I venture to suggest that, as before mentioned, while the superior churches were set out by the more skilled lodges of freemasons to point due east, other church-builders preferred the traditional method of setting the church to the rising sun at the time they commenced to work ; and as in our bleak north country, and in the absence of made roads, they would naturally commence building in spring or early summer, that circumstance would account for the great variety of orientation.*

* Some months after reading this paper, a singular confirmation of the theory suggested appeared on the walls of the Royal Academy’s exhibition, in a picture by John Pettie, R.A., entitled, “*Site of an Early Christian Altar.*” The artist’s explanation of the subject is given in the catalogue as follows :—“The method adopted in fixing the orientation of churches has been preserved in some of the Scotch lodges. . . The site of the altar was decided upon and marked by a pole fixed in the ground. . . The sun’s rays appearing above the horizon fixed the line of orientation.”—*Laurie’s History of Freemasonry.*

There is a record by a contemporary monk of the building of a priory church in Anglo Saxon times, in which he tells us that in the winter they provided the iron and timber and utensils that were wanted for a handsome church, and *in the spring* a firm foundation was laid and the work proceeded with.

There are several interesting matters detailed in this record of the monk of Ramsey, but the only one illustrating my subject is, that the work of setting out the church was deferred until the spring.

I am sorry not to have been able to obtain the orientations of a group of country churches in the south of England, but I am informed by an authority that they are very various. I did, however, ascertain the orientations of twelve old churches in Yorkshire, and found the same variety of bearings, but with a larger proportion south of true east. This is also the case with the ancient churches of London, which, however, in consequence of the devastations of the great fire of 1666 and subsequent rebuildings and demolitions, are not numerous. Guided by reliable authorities, I have been enabled to identify on the Ordnance map some thirty churches as either original ancient churches, or in which some part of the old church is incorporated, together with a few other rebuilt churches which there is reason to believe were built on the old lines. The orientation of this group may be briefly summarised as follows:—*True East*, none. *South of East*, 2° to 10° , twelve churches; 10° to 20° , fourteen churches; 20° to 28° , four churches. *North of East*, 2° to 10° , six churches; and four churches respectively 20° , 30° , 41° , and 43° ; *i.e.*, thirty churches set from 2° to 28° south, and ten from 2° to 43° north.

There were also a large number of city churches rebuilt since the great fire, upon the sites of the destroyed fabrics, of which there is no certain evidence that they preserve the original orientations; but they nevertheless present very much the same variety of bearing as the group I have summarised.

On comparing the general orientation of these London churches with our northern group, we observe that while the former are principally south, the latter are north, of true east; indicating, on

the sunrise theory of orientation, that the builders in the south were, on account of the milder character of the climate, able to commence building operations much earlier in the spring.

At first sight it may appear, that not sunrise orientation, but proximity of streets, influenced the peculiar and varied positions of the city churches; but I submit that at the early period of most of these churches' foundation, in Norman or even earlier times, that cause could not exist. For the most part, I should say, the churches were built in open ground, and the streets took their direction; and so gave rise to the great irregularity and obliquity of the old streets. A curious example of this is evident in the case of St. Bartholomew the Great, in Smithfield, an interesting original Norman priory church, built outside the city walls in the open fields with the extraordinary orientation of 40° north (*i.e.* midsummer orientation), and that bearing has evidently ruled the direction of the streets subsequently formed in its vicinity.

The ancient churches of the two archiepiscopal cities of Canterbury and York present a remarkable contrast in their respective orientations.

In Canterbury all the old churches—thirteen in number—are oriented *south* of east; the most eastern is Saint Martin's (the oldest and most historical church in England), it is 7° south, the Cathedral 8° , the rest ranging 9, 18, 23, 26, 28, 28, 31, and three at 39 degrees south, the latter being midwinter orientations.

In York all the old churches—twenty-five in number—are, with one exception, set *north* of east, beginning with the Minster, 3° north, they range gradually up to 43° north, that being midsummer orientation. The exception referred to is that of St. Michael-de-belfrey, within the Minster precincts, and is set 37° south: the reason, however, for giving it that position appears evident—the church was entirely rebuilt in the late Perpendicular period when, probably to disengage it as far as possible from the Minster, it was set close up to and in a line with the adjoining street.

The cathedral city of Norwich (exactly half-way between Canterbury and York as to latitude) has its thirty-four old churches set both north and south of east, but with the larger proportion north,

and with a greater number due east, or nearly so, than is usually met with. They are as follows: eight churches within 4° each way, or 4° N. and S. of east; the Cathedral at 6° , and nineteen churches from 9° to 27° , all north of east; and four churches from 5° to 20° south of east.

There is a theory that churches were set to the rising sun on the day of the saint to whom the church was dedicated. So far, however, as the group of churches in the table, and the twelve in Yorkshire alluded to, can be taken as proof, this theory is without any sufficient foundation. An examination of the table will show that only in two or three instances of St. Marys and St. Michaels set nearly true east is there even an approximation to the orientation implied by this theory; while, on the other hand, we find churches with the same dedications set at widely-different bearings. It is also to be observed that while for the group of eighty-seven churches there are only twenty-four patron saints, the festival days of thirteen of the number are in the winter on days which would give orientations much further south than any of the group. Thus, St. Andrew's day is, as every Scotchman, and I may also say every Penrithian, knows, on the 30th of November, when the sun rises about 40° *south* of true east; but instead of that saint day orientation, we find six St. Andrews set from 4° to 22° *north* of true east; neither do I find on comparing the dedications with the orientations of the large number of city churches before referred to, that they lend themselves to the saint's day theory any better than do our northern group. I need not, however, pursue the subject further; a glance at the table will show that the Patron Saint-day theory is untenable. I will only further point out that, when we correct the dates of the saints' days for the "old style," by advancing them five to eleven days further into the year, according to the early or late period in which the church was built, even these occasional approximations of saint-day to actual orientations will be very likely to disappear.

On the theory of the orientation being fixed by the rising sun, a reference to the table will show the time of year when any church in the list was commenced; and on the supposition that

building would be commenced only in spring or early summer, we have in the first column of sun-rise dates the time when each church was set out.

Occasionally a slight difference of orientation may be observed between the nave and the chancel of an old church, to account for which some fanciful theories have been advanced. In "Brandon's Parish Churches," plans of over sixty notable old churches in the southern counties are given, most minutely measured and drawn, and with every little peculiarity carefully noted; but in none of them does this change of orientation appear; and from my own observations also I am inclined to think that such cases are so exceptional, that they do not justify the advancement of any theories of general application: they were probably only the result of careless setting out when a chancel has been re-built at a period subsequent to the building of the original church.

To determine the true east without having recourse to celestial observations by theodolite or other instrument is a very simple operation. Like the well-known preliminary to jugging hare—first catch your hare; we must catch the sun and trust to his shining for a few hours near noon, then upon a level piece of ground set up a pole perpendicularly, or, as a neater operation, upon a sheet of paper upon a level board fix a straight wire—say a knitting-needle—at right angles, i.e., perpendicular to the board; from the point where the pole or needle is placed describe at random a few concentric semicircles on the north side of the needle, now observe when the end of the needle's shadow crosses the circles before noon, and mark each point of intersection; repeat the operation after noon, and draw a line from the point so marked on any one of the circles before noon to the point of shadow intersection on the same circle after noon, and the line so drawn will be true east and west. As a check or an alternative, by careful observation about noon mark where the end of the shadow just touches the circumference of a circle without crossing it, then the shadow is shortest and gives the true north and south; it is also twelve o'clock by the sun, and a line drawn at right angles to the line of the shadow is true east and west.

The deviation of a church from true east and west is frequently made apparent to the eye by a sun-dial upon its southern wall, when either the face of the dial is set at an angle with the wall to be true east and west, or the "gnomon" or hand is set obliquely so as to correct the erroneous orientation of the wall—this is so with the dial on Penrith Church.

Closely allied to the orientation of churches is the application of the same idea to the burial of the dead, from the earliest times. Bourne, in his book on "Popular Antiquities," quotes Cassalion, a writer in the fourth century, as saying: "The faithful of old were so observing of this ceremony of looking towards the east, that they not only strictly observed it in their prayers when living, but even when they were dead their bodies were placed with their faces upwards in the sepulchre looking towards the east."

The "Giant's Grave," in Penrith churchyard, is perhaps as complete an illustration of ancient sepulchral orientation as can be found. It has a high pillar, surmounted by a cross, at each end of the grave; the crosses, though much defaced, are still unmistakeably indicated. The grave has an orientation four degrees more northerly than the church; and, if set to the rising sun, the burial took place either about the end of April or the middle of August. The grave having an orientation distinct to that of the church, appears to indicate a greater antiquity than that of the original church, which, if then built, would have naturally ruled the orientation of the grave.

Although more remotely connected with our special subject, the discredit attached to the ground on the north side of the church is too curious to remain unnoticed; our forefathers considered the south side of the church as the only properly sacred ground. That at the east end and at the west end might in case of necessity, arising from over-crowding, be ventured upon; but the north side was in every way diabolical—the haunt of evil spirits, and the place of burial for the unbaptised, the excommunicated, and the suicide. The history of any old churchyard in a sparsely-populated place will illustrate this; we may still find instances where the ground on the south side of the church is crowded with graves,

while the north side is entirely unoccupied, or only beginning to be used.

At Crosthwaite, the church of my boyhood, I remember when there were only two or three graves on the north side, and they were quite recent ones; while the south side was indecently crowded. Nobody liked the "back of the church," as it was called. The graves seemed to be advancing stealthily northwards towards the ill-favoured region, as if supported and backed up by the much good company on their south side, until at length some persons of distinction—Southey for one—were buried there, and then the evil charm was broken, that part of the ground rapidly filled, and additional space for burials had to be procured.

A remarkable relic of this old superstition may be seen in a window of the north aisle of Crosthwaite Church, where a fine specimen of ancient stained glass shows a priest holding in one hand a "holy bell," and in the other the "holy book," evidently engaged in the arduous duty of scaring away or keeping in decent order the disreputable crew supposed to be outside.

The belief in the presence of devils and the efficacy of holy bells must have been very general, since it was deemed necessary in the reign of Edward VI. to enact that "all ringing of holy bells to drive away devils should be forborne, and all ringing of knowling bells save one before service."

The discredit anciently attached to the north side of the church is also illustrated by the existence of a small door in the north side of old churches known as the penitents' or devils' door, which it is said was set open during baptisms, for evil spirits, supposed to be driven out by the holy rite, to find ready egress to their assigned location.

A "Bell and Book" reminiscence, it has occurred to me, remains in a perverted form in this town; we have two hostelries of ancient origin—the "Bell and Bullock" and the "Mitre;" they adjoin each other, and are in proximity to places still bearing ecclesiastical names—the Church, Bishop-yards, Friarage, Abbots' Bank, Friar Street (or Gate); and until recent years the hostelries were of

Bishophold tenure, pretty clearly indicating their original ecclesiastical connection.

The "Mitre" speaks for itself; and the sign of the "Bell and Bullock," I venture to suggest, is a perversion of the holy "Bell and Book," and perhaps even the word "bull" might have been there indicating the Pope's bull or sealed and certified benediction of the bell; in this way the Bell, Bull, and Book might be the ancestor of the modern "Bell and Bullock."

While (as I intimated at the commencement) the subject I have brought before you has no important practical bearing on modern life, I trust that the old world reminiscences; the strange phases of religious and social feelings in bygone times brought to our notice by the subject; may have been of sufficient interest to be worth the time you have given to it, and in some measure compensate you for your patient attention.

ORIENTATION OF CHURCHES IN THE DIOCESE OF CARLISLE.

FALCON SAINTS' DAYS, or the times of Orientations due to their day.	DATES AND DEGREES OF ORIENTATIONS.			Degrees 43½	GROUP OF CHURCHES, comprising Churches wholly or in part mediæval fabrics, having the original orientations indubitably preserved, these being indicated by an asterisk preceding the name. The remainder are Churches re-built on the sites of ancient foundations, there being no reason to suppose that the original orientation has been departed from. ABBREVIATIONS: Duplicate names are distinguished by C. for Cumberland; W. for Westmorland; Car. for Carlisle District. DEDICATIONS: ? indicates doubtful; †† lost or not ascertained. Abbreviated names, as Mag. for Magdalene, will be self-apparent.	
	WINTER.		SUMMER.			N. & S. of LEASE.
	WINTER.	SUMMER.	WINTER.			N. & S. of LEASE.
	JUNE 21st				NORTH OF EAST. MIDSUMMER.	
S. John Bap., June 24	June 13	June 29	43		*EDENHALL, <i>S. Cuthbert</i> .	
S. Peter, June 29	„ 7	July 5	42		*GILCRUX, <i>S. Mary</i> . *CROTHWAITE, <i>W. S. Mary</i> . *CROOK, <i>S. Catherine</i> . IRTHINGTON, <i>S. Kentigern</i> .	
S. Mary Visit., July 2	„ „	„ 19	38		*KIRKOSWALD, <i>S. Oswald</i> . CROGLIN, <i>S. John Bap.</i>	
S. Margaret, July 20	May 25	„ 21	37		CLIBURN, <i>S. Cuthbert</i> . *ALDINGHAM, <i>S. Cuthbert</i> .	
S. Mary Mag., July 22	„ 22	„ 21	37		*BOLTON IREBY, <i>All Saints</i> . RENWICK, <i>All Saints</i> . GREAT ASBY, <i>S. Peter</i> .	
S. James, July 25	„ 20	„ 24	36		*ST. BEES, <i>S. Bega</i> . *DISTINGTON, †† STANWIX, <i>S. Michael</i> . ASKHAM, <i>S. Peter</i> or <i>S. Columba</i> ?	
	„ 13	„ 31	33		*AIKTON, <i>S. Andrew</i> . *BROUGHAM CHAPEL, <i>S. Wilfred</i> .	
	„ 7	Aug. 6	30		*MELMERBY, <i>S. John Bap.</i> *LONGMARTON, <i>S. Margaret</i> . *DEAN, <i>S. Oswald</i> . *ARLECDON, <i>S. Michael</i> .	
S. Lawrence, Aug. 10	„ 6	„ 8	29		*PENRITH, <i>S. Andrew</i> . *GREYSTOKE, <i>S. Andrew</i> . *GOSFORTH, <i>S. Mary</i> .	
S. Mary Assum., Aug. 15	„ 28	„ 15	25		*CROTHWAITE, <i>C., S. Kentigern</i> . *ASPATRIA, <i>S. Kentigern</i> . *OUSBY, <i>S. Luke</i> . HARRINGTON ††	
	„ 27	„ 17	24		*ADDINGHAM, <i>S. Michael</i> . *THURSBY, <i>S. Andrew</i> . PATERDALE, <i>S. Patrick</i> .	
	„ 25	„ 19	23		*DACRE, <i>S. Andrew</i> . *MORLAND, <i>S. Lawrence</i> . *BOWNESS, <i>W., S. Martin</i> . EMBLETON, <i>S. Cuthbert</i> .	
	„ 23	„ 20	22		*BROUGH, <i>W., S. Michael</i> . *NEWTON ARLOSH, <i>S. John</i> . THRELKELD, <i>S. Mary</i> . BAMPTON, <i>S. Patrick</i> .	
	„ 22	„ 22	21		*ABBEY-TOWN, <i>S. Mary</i> . *NETHER DENTON, <i>S. Cuthbert</i> . DUFTON, <i>S. Cuthbert</i> . CULGAITH, <i>All Saints</i> . *BROUGHTON-IN-FURNESS, <i>S. Mary Mag.</i>	
	„ 20	„ 24	20		*BONGATE, APPELBY, <i>S. Michael</i> . *BOLTON, <i>W., All Saints</i> . *MUNCASTER, <i>S. Michael</i> . WATERMILLOCK, <i>All Saints</i> .	
	„ 19	„ 25	19		*CLIFTON, <i>S. Cuthbert</i> . *SHAP, <i>S. Michael</i> . *SHAP ABBEY RUINS, <i>S. Mary Magdalene</i> . *UPPER DENTON, †† GREAT ORTON, ††	
	„ 17	„ 27	18		*DEARHAM, †† *BURTON, <i>S. James</i> . *ST. BRIDGET, BECKERMET, Old Church. MUNGRISDALE, <i>S. Mango</i> .	
	„ 15	„ 30	17		*BRIGHAM, <i>S. Bridget</i> . LAZONBY, <i>S. Nicholas</i> . GREAT MUSGRAVE, <i>S. Theobald</i> . HAILE, <i>S. Thomas A' Becket</i> ? *URSWICK, <i>S. Michael</i> .	
	„ 13	„ 28	16		*BROUGHAM, <i>S. Ninian</i> . *BROMFIELD, <i>S. Mungo</i> . PLUMBLEND, <i>S. Cuthbert</i> .	
	„ 12	„ 11	15		*SEBERGHAM, <i>S. Mary</i> . *CROSCANONBY, <i>S. John</i> . *EGREMOND, <i>S. Mary</i> .	
	„ 11	„ 2	14		*ORTON, <i>W., All Saints</i> . *GREAT SALKELD, <i>S. Cuthbert</i> . *HAYTON, <i>Car., S. Mary Mag.</i> LORTON, <i>S. Cuthbert</i> . BRAMPTON, Old Ch., <i>S. Martin</i> .	
	„ 9	„ 4	13		*DALSTON, <i>S. Michael</i> . KIRKBRIDE, <i>S. Bridget</i> . *TORPENHOW, <i>S. Michael</i> . *MORESBY, <i>S. Bridget</i> .	
	„ 8	„ 5	12		*APPELBY, <i>S. Lawrence</i> . *KIRKLAND, <i>S. Lawrence</i> . *KIRKBYTHORPE, <i>S. Michael</i> . *WHITBECK, <i>S. Mary</i> .	
S. Bega, Sep. 6	„ 9	„ 4	13		*KIRKBY LONSDALE, <i>S. Mary</i> . *KIRKBAMPTON, <i>S. Peter</i> . *CROSBY-UPON-EDEN, <i>S. John</i> . *ST. JOHN BECKERMET. *MILLOM, <i>Holy Trinity</i> . *KIRKLINTON, <i>S. Cuthbert</i> .	
Old Lady Day, April 6	„ 6	„ 8	11		*CROSBY RAVENSWORTH, <i>S. Lawrence</i> . *ISELL, <i>S. Michael</i> . *BEAUMONT, <i>S. Mary</i> . *SCALEBY, <i>All Saints</i> . *LANERCOST ABBEY, <i>S. Mary Mag.</i> *BEETHAM, <i>S. Michael</i> .	
S. Mary Nativ. Sep. 8	„ 5	„ 10	10		*BARTON, <i>S. Michael</i> . *CAMERTON, †† HESKET-IN-THE-FOREST, <i>S. Mary</i> . TEMPLE SOWERBY, <i>S. James</i> .	
	„ 3	„ 11	8		*CARLISLE CATHEDRAL, <i>S. Mary</i> . *KIRKBY-STEPHEN, <i>S. Stephen</i> . *ALLHALLOWS, <i>All Saints</i> . *MILBURN, <i>S. Cuthbert</i> . *LAMPLUGH, <i>S. Michael</i> .	
	„ 2	„ 13	7		*NEWTON REIGNY, <i>S. John</i> ? CASTLE CARROCK, <i>S. Peter</i> . *BOOTLE, <i>S. Michael</i> . *CUMWHITTON, <i>S. Mary</i> .	
	„ 1	„ 11	6		TRUE EAST—*SKELTON, <i>S. Mary</i> . *BRIDEKIRK, <i>S. Bridget</i> . *WARWICK BRIDGE, <i>S. Leonard</i> . *CORNEY, <i>S. John Bap.</i> *ULVERSTON, <i>S. Mary</i> .	
S. Cuthbert, March 20	„ 20	„ 24	4	NORTH OF EAST	*WETHERAL, <i>Holy Trinity</i> . *BASSENTHWAITE, <i>S. Bridget</i> .	
S. Ninian, Sept. 25	„ 18	„ 25	2	SOUTH OF EAST	*LOWTHER, <i>S. Michael</i> . *WHICHAM, <i>S. Mary</i> . *WORKINGTON, <i>S. Michael</i> . CARTMELL PRIORY Ch., <i>S. Mary</i> .	
S. Patrick, March 17	„ 16	„ 28	1		*VARCOP, <i>S. Columba</i> . AINSTABLE, <i>S. Michael</i> . *PONSONBY, ††	
S. Michael, Sept. 29	„ 15	„ 29	4		*KENDAL, <i>Holy Trinity</i> . *ORMSIBLE, <i>S. James</i> .	
	„ 14	Oct. 1	6		*GALDBECK, <i>S. Kentigern</i> . *NEWBIGIN, <i>W., S. Edmund</i> .	
	„ 12	„ 2	6		*BURGH-BY-SANDS, <i>S. Michael</i> . *HEVERSHAM, <i>S. Peter</i> .	
	„ 9	„ 5	8		*WESTVARD, <i>S. Mary</i> ? *CLEATOR, <i>S. Leonard</i> . *LITTLE ASBY (ruins), <i>S. Leonard</i> .	
	„ 6	„ 8	10		*ULDALE Old Ch., <i>S. James</i> . *FARLAM Old Ch., <i>S. Thomas à Becket</i> .	
	„ 3	„ 11	12		*BEWCASTLE, <i>S. Cuthbert</i> . *GRINSDALE, <i>S. Kentigern</i> .	
	„ 2	„ 12	13			
	„ 2	„ 14	14			
	„ 26	„ 18	17			
	„ 9	Nov. 1	26			
	„ 6	„ 6	28			
	Jan. 31	„ 11	31			
	„ 23	„ 19	35			
	„ 21	„ 20	36			
	„ 16	„ 24	37			
	„ 17	„ 25	38			
	„ 13	„ 28	39			
	„ 11	„ 30	40			
	„ 8	Dec. 5	41			
	„ 4	„ 9	42			
	Dec. 29	„ 14	43			
	DECR. 21st		43½		SOUTH OF EAST. MIDWINTER.	

NOTES REFERRING TO THE TABLE.

The degrees of orientations are obtained as nearly as may be from the 25 inch and 6 inch Maps of the Ordnance Survey made 1856-63, and will not apply to Churches re-built since the Survey, unless re-erected upon the old lines.

Churches re-built on sites of ancient fabrics known or suspected of being changed as to orientation, and post-Reformation Churches of new foundation, have, when known, been omitted.

The East and West points of the Ordnance Maps (identical with the top and bottom marginal lines of the sheets) are set to the true or sun's meridian, the magnetic meridian not being recognised.

The left-hand column of the Table is introduced to facilitate the enquiry how far sun-rise on Patron Saints' Days may have ruled the orientations of the Churches bearing their names; but, to be exact in this matter, the Saints' Days should be corrected for *old style*, (see page 66), thus for a 12th century S. Cuthbert's church the Saint's Day, March 20th, would be our March 27th, and the orientation due to it 4° north of east, while for a 16th century S. Cuthbert's church it would be our March 31st, with orientation 7° north of east.

This Table, referred to in the Paper as comprising eighty-seven churches, has, since the sheets were printed off, been considerably enlarged by the addition of several important typical churches.

S. Cuthbert's, Carlisle, the church referred to in page 63 as being 40° north of east is now omitted, the originality of its orientation being found doubtful.

ADDENDA TO "ORIENTATION OF ANCIENT CHURCHES."

IF the early church builders could be credited with the knowledge of the magnetic needle, the variety of church orientations might to some extent be attributed to its use, because the needle itself has varied considerably at different times. The earliest record of its variation is in 1576, when it was 11° east of true north; in 1662 it was true north; then it gradually went to the west until 1804, when it was 24° west; since then it has been returning towards the true north, and is now, for this longitude 20° , and for that of Norwich 17° , west of true north. I do not, however, believe that the early church builders used the needle, or even knew of its existence; but if they did, and its variations were the same before 1576 as since, the use of the needle would account only for 48° degrees of variation, whereas on collating the orientations of the cathedral city churches (pages 64-5) and those of our own diocese, we find a range of 80° , in short they are spread over the entire range of the sun's eastern amplitude, proving, I think, that to sunrise between winter and summer, and not to the limited variations of the magnetic needle, is due the great variety of church orientations.

In *Notes and Queries*, August 29th, 1885, appears a quotation from a French author attributing the origin of the eastern position in prayer, and the consequent orientation of churches, to the belief of the early christians that the terrestrial paradise in the garden of Eden was in the east, and ought to be turned to in prayer. This tradition is likely enough to be true of the early christians of Palestine and the southern parts of Christendom, and furnishes an additional illustration of the temporising policy by which pagan observances, instead of being eradicated, were converted into christian ritual and clothed in Biblical dress; thus the reverence for the region of the rising sun was transferred to the supposed position of the terrestrial paradise.

Now if this tradition had reached the early church builders of Britain, and ruled their church orientations, we should expect to find all their churches set from 25° to 30° south of east, that being the direction of Palestine and its eastern regions; or lacking sufficient geographical knowledge to arrive at that result, they would surely have adopted some one eastern point—naturally the true east—as an ideal position of the garden of Eden; we cannot well suppose they believed the terrestrial paradise to be at all points wherever the sun rose throughout the year. The French author's theory therefore leaves untouched the problem of the great diversity of English church orientation.

In addition to the notices of churches in cathedral cities, it has been ascertained that in Exeter the cathedral alone is south of east 6° , and all the ancient churches from 4° to 39° north of east.

TRILOBITES OF THE SKIDDAW SLATES.

BY J. POSTLETHWAITE, F.G.S.

(Read at the Bowness Annual Meeting.)

I believe the earliest record of the discovery of Trilobites in the Skiddaw Slates occurs in the "Quarterly Journal," for November, 1866, in a note by Mr. Salter, "on two new species of Trilobites." One of these, *Phacops nicholsoni*, was a Skiddaw Slate specimen, found by Professor Harkness on Whiteside, about five miles west of Keswick.* Ten years later, Mr. J. Clifton Ward's "Memoir of the Geology of the Northern Part of the English Lake District" was issued, containing an appendix by Mr. Etheridge, in which four trilobites from the Skiddaw Slates are described, namely, *Niobe doveri*, sp. nov., *Æglina* sp., *Asaphus* sp., and *Cybele ovata*, sp. nov. The first three are from the cabinet of Mr. W. Kinsey Dover, and are figured on plate 12; but the last, which was found by Mr. Birkett, at Sandy Beck, south of Cockermouth, arrived too late to be included in the plate. Since the publication of Mr. Ward's memoir, a number of trilobites have been found in the Skiddaw Slates by various collectors, differing in some points from all known forms. Some of them resemble *Illænopsis thomsoni*, (Salter's "Monograph of British Trilobites," p. 213, plate 20,) in the widely-divergent and deeply-cut axial furrows, reaching to the front of the carapace, and in the short pointed and grooved pleuræ,

* The discovery of Trilobites in the Skiddaw Slates is also mentioned in Murchison's "Siluria," p. 146.

but differ from it in having a comparatively-flat glabella, whereas Mr. Salter's specimen is remarkable for its convexity.

The features of trilobites on which authors chiefly base their classification, are the perfect or imperfect development of the eye, the form and position of the facial suture, the number of body segments, and the relative size of the pygidium. In our Skiddaw Slate specimens, the eyes and facial sutures are either indistinct or altogether absent; therefore, any classification, if attempted, must be based on other features; but, as the materials at hand are meagre and imperfect, it would be premature to name or to classify them until we obtain a larger assemblage of their fossil remains, I shall, therefore, merely group them together in the following order, namely:—

A. Trilobites having the thoracic portion of the axial furrows more or less curved, caudal shield doubtful or altogether absent.

B. Forms having the thoracic portion of the axial furrows more or less curved, and a well-developed caudal shield.

C. Those having the axial furrows straight, except the outward curve near the margin of the carapace, and the rounded posterior extremity of the axis; a caudal shield being present.

And I shall distinguish each specimen by a number instead of a name.

Group A. No. 1.

The body is broadly ovate, tapering slightly towards the caudal extremity; the entire length is eight-tenths, and the width six-tenths of an inch; axis, narrow; pleuræ about one-half wider than the axis. Cephalic shield short and broad, the glabella expands slightly towards the front margin, which is well rounded, and the upper, middle, and basal lobes are well developed. The cheeks are ornamented with lateral ridges and furrows, in a line with the lobes and furrows of the glabella; axial furrows clearly defined, eyes indistinct. The axis expands slightly from the posterior margin of the glabella to the middle of the thorax, and then tapers gently towards the tail. There are nine thoracic segments left, but

probably the number may have been greater, as the remainder of the thorax and pygidium are wanting, the outer shelly covering having disappeared, but the size and shape are indicated by a smooth surface on the slate. The first segments of the pleuræ curve backwards at the extremities, and the curvature increases towards the pygidium, until at the ninth segment it commences one-tenth of an inch from the axis. This specimen, which is only a cast or mould in the slate, approaches very nearly in general form, size, and structure to *Cybele ovata*, the principal difference being that our specimen shows no trace of the upward curve at the extremities of the pleuræ.

Locality—summit of Skiddaw. The specimen was found by a lady tourist, who having climbed to that elevation with much toil and fatigue, wished to carry away some memento of her exploit, and picked up a piece of slate for that purpose, near the base of the pile of stones which marks the highest point. Looking at it closely, she observed what she supposed to be a shell, and on returning to Keswick, submitted it for examination to Mr. Birkett, assistant-curator of the Museum of Local Natural History, and he induced her to place it in the museum. The locality is within the area over which the metamorphic action of the Skiddaw Granite extends, and the slate contains numerous well-developed crystals of chialtolite.

Group A. No. 2.

This specimen consists of the impression of a large and very beautiful trilobite, representing part of the left pleuræ, axis, and pygidium, in a fair state of preservation, but the remainder of the body is partly imperfect, partly covered by overlying slate, and partly obliterated. The thoracic portion of the axis is faintly rounded, and measures an inch and nine-tenths in length, and an inch and a half in width; it appears to maintain its width to the third segment, and then to taper rapidly towards the pygidium; the right axial furrow is partly covered, but the left is clearly defined. Body segments, eight, smooth and well-rounded; thoracic portion of pleuræ about half the width of axis, segments pointed

and curved upwards at the tip, and along the middle of each there is a deep furrow. The pygidium is obscure, except the left margin, which consists of segments similar to those of the pleuræ, but they extend three-tenths of an inch beyond it, showing that this part of the animal must have been unusually large. Cephalic shield entirely obliterated.

Locality—Randel Crag, on the north-west side of Skiddaw. This specimen is from my own cabinet.

Group A. No. 3.

This specimen consists of an incomplete impression of the thorax and pygidium of a very peculiar species; the three lobes are of equal size, and each tapers rapidly to a point. The edge of one lobe is broken off, but when complete, the entire width at the front margin would be about six-tenths, and the length only four-tenths, of an inch. Each lobe is well-rounded, and would probably have eight segments—the number cannot be clearly determined, as they are filled up at the caudal extremity. There is no trace of the head. If trilobites cast their shells at certain periods, like crabs, this specimen may represent the dorsal portion of a cast-off shell.

Locality—Outerside, on the north-east of Causey Pike. From Mr. Dover's cabinet.

Group B. No. 1.

Body elongated oval, length eight-tenths, and width four-tenths, of an inch. The cephalic shield, which is somewhat indistinct, occupies nearly half the entire length of the body; the front margin of the glabella is slightly pointed, and there is a small triangular projection in the centre of the posterior margin, which partly overlaps the first thoracic segment. The cheeks are small, and the outer angle of the posterior margin seems to be furnished with a minute spine. The front portion of the axis is three times the width of the pleuræ, but it tapers with a rapid curve, and terminates in a slender needle-like spine, which reaches nearly to the posterior margin of the caudal shield; there are eight segments

on the axis, but five only appear to belong to the thorax, and the remaining three to the pygidium. The segments of the pleuræ curve faintly backwards, and increase in length towards the pygidium, in proportion as the axis decreases in width, so that the entire width of the body is maintained until it terminates in a semi-circular caudal shield.

Group B. No. 2.

On the same fragment of slate there is the hollow cast of another trilobite, about half the size of the one just described, and apparently of the same species, as the general form and proportions are alike in both.

Locality—Randel Crag. From Mr. Dover's cabinet.

Group B. No. 3.

This specimen is a good deal distorted, especially the head. Length six-tenths, and width four-tenths, of an inch. The glabella appears to have been small, and almost circular, while the cheeks are large, swelling out in front beyond the margin of the glabella, which is rather depressed. The thorax and the pygidium are slightly rounded and well-defined, axial furrows deep; axis double the width of the pleuræ in front, and tapering to a point at the caudal extremity; thoracic segments seven in number. The body maintains its width nearly to the tail, caudal shield obtusely pointed, and terminated by a small thread-like ridge, which extends round the margin.

Group B. No. 4.

On the same fragment of slate there are the crushed remains of another trilobite, apparently of the same species, but not more than a third of the size.

Locality—Buzzard Crag, on the north-west side of Skiddaw. From Mr. Dover's cabinet.

Group B. No. 5.

This is a very beautiful and almost-perfect specimen. The head is nearly half the entire length of the body, well-rounded in front,

but a little narrower than the truncated pygidium; length two inches and a tenth, width an inch and three-tenths. Glabella large and baloon-like in shape; the eyes appear to occupy the greater part of the cheeks, which are not more than one-eighth the size of the glabella. The front portion of the axis is about three times the width of the first segments of the pleuræ, it then tapers with a rapid curve nearly to the posterior margin of the caudal shield, where it is considerably less than half the width of the opposite end. There are six thoracic segments, the first two are straight, but the remaining four are slightly arched. The posterior segments of the pleuræ are almost double the length of the front segments; all of them curve gently backwards. The caudal shield is an elongated oval, along the posterior margin of which there is a raised rounded band.

Locality—Outside. From Mr. Harrison's cabinet.

The matrix in which it is imbedded is the light grey indurated Skiddaw Slate which occurs at that place. If the slate had been of the ordinary type the fossil would have disappeared long ago, as the rock to which it was attached projected about eighteen inches from the ground, and the fossil being on the upper surface, must have been subjected to the abrading action of the weather for a great length of time. I was in company with Mr. Harrison when he found it, and had the pleasure of chiselling it from the rock.

Group B. No. 6.

General form oblong, tapering slightly towards the head; length fourteen-twentieths, and width eleven-twentieths, of an inch. The axis is well-rounded, and is about one-third wider than the pleuræ; it maintains its width from the posterior margin of the cephalic shield to the fourth segment, and then tapers rapidly to the extremity, which is about one-twentieth of an inch from the margin of the caudal shield: at that point its width is one-tenth of an inch. The axial furrows terminate at the base of the cephalic shield; there are five thoracic segments, and five on the pygidium. The head is imperfect, and the portion remaining is indistinct, but it appears to have been very small; the glabella is baloon-like in

form, and there is a crescent-shaped furrow at the base ; the cheeks do not appear to extend outwards so far as the first pair of segments ; eyes indistinct. The thoracic segments of the pleuræ are very-clearly defined, they spread outwards horizontally from the deep axial furrow, but curve backwards at the outer extremity. The caudal shield is large and semi-circular, indeed it appears to be nearly double the size of the cephalic shield ; the pleural segments of the pygidium, as well as those on the caudal portion of the axis, are fainter than the thoracic segments : the first three of the former extend to the margin of the pygidium, but the remainder of the caudal shield terminates posteriorly in a broad fascia of equal width all round.

Locality—This specimen was found, I believe, by Mr. Ward, placed on a large stone at the roadside, beneath White Pike. It is imbedded in a fragment of the hard Skiddaw Slate grit which occurs near that place. It now belongs to the Keswick Museum.

Group C. No. 1.

General form oblong, tapering a little towards the tail ; a small portion of the front margin of the cephalic shield is wanting. When complete, the length would be about three inches and eight-tenths, and the width two inches and three-tenths. The glabella is slightly convex and very large, occupying about three-fourths of the cephalic shield ; axial furrows curve outwards in front of the cheeks, which are small and almost triangular in shape. The eyes are indistinct, but appear to be placed near the glabella, about one-third of the distance from the posterior margin of the cheeks. The axis is large, and tapers rapidly towards the caudal extremity, the front portion being nearly double the width of the pleuræ. There are eight thoracic segments on the axis, they are well-rounded and quite straight near the head, but faintly arched near the pygidium ; on the pleuræ they droop backwards, and the evenly-rounded surface gives place to a deep furrow. The pygidium consists of a large oval shield, along the posterior margin of which there is a broad depressed band ; the remainder

of the surface is slightly gibbous, but perfectly smooth, except where the raised axis crosses it to the margin of the depressed band.

Locality—This beautiful and well-preserved specimen was found by Mr. Harrison at Randel Crag.

Group C. No. 2.

In general form this species is broadly oval, but the specimen is so much weathered that its distinctive features are almost obliterated. The oval disc and axis, however, are clearly defined. Length three inches and four-tenths, and width two inches and seven-tenths. The axis is well-rounded; it measures one inch and a tenth at the front part, and tapers to half an inch at the caudal extremity, which is about two-tenths of an inch from the posterior margin of the pygidium; on the front portion it shows distinct traces of seven segments. Axal furrows deeply cut and quite straight, except the outward curve at the margin of the carapace. The head appears to have been unusually small, measuring only half an inch from the front segment, but in all probability the latter may have belonged to the cephalic shield, and the remaining six would be thoracic segments. The distinguishing features of the pleuræ and caudal shield cannot be made out.

Locality—Randel Crag. From Mr. Harrison's cabinet.

Group C. No. 3.

This is the largest trilobite that has been found in the Skiddaw Slate formation, but unfortunately it is in a very imperfect state; the pygidium, right pleuræ, and a part of the cephalic shield are broken off; when complete, it would be at least nine inches in length, and five inches in width. The general surface of the body is faintly rounded, cephalic shield almost semi-circular in shape, glabella large, and apparently devoid of ornament, except a faintly-arched furrow at the base; axal furrows curve boldly outwards from the base to the margin of the cephalic shield. The right cheek has disappeared, but the left is clearly defined: it is about one-fourth the size of the glabella, and in form resembles a gothic

arch; the outer posterior angle is prolonged in the form of a small spine. Near the glabella there is a large pear-shaped mark indicating the position of the eye, which appears to have occupied nearly a third of the cheek. Axis about one-third wider than the pleuræ, and tapering gently towards the pygidium; there are seven well-defined thoracic segments, and it is probable that the number may have been eight: they are faintly-arched, and the ends adjoining the axial furrows are well-rounded. The front segments measure nearly half an inch in width, but they are a little narrower towards the pygidium. The segments of the pleuræ correspond with those on the axis, and maintain the same curve, they are also well-rounded at the end adjoining the axial furrow, but are obtusely-pointed at the outer end.

Locality—Randel Crag. From my own cabinet.

The deposition of the slate at Randel Crag must have been under conditions unusually favourable for the growth and development of animal life, and also for the fossilization of their remains, as many of the best-developed and most perfectly-preserved trilobites and graptolites have been found there.

The fossil remains of trilobites differ very much from those of the graptolites occurring in the same beds; the latter, when obtained in relief, always consist of iron pyrites, which has replaced the original chitinous shell of the organism, and the shell appears to have been of equal hardness on every side; but the remains of trilobites almost invariably consist of slate of the same type as that in which they are enclosed, and it is the dorsal surface alone that has been fossilized. It is evident, therefore, that the shell on the ventral surface of the body has been of a very fragile character, and that in almost every case it has perished, together with the legs, swimming appendages, and internal organs of the creature, the dorsal shell alone being sufficiently hard to retain its form until the fine mud of which the Skiddaw Slate is formed became solidified above and beneath it; hence, when the slate breaks up along the bedding planes, we find a cast only of the whole or a part of the internal or external surface of the shell. The shell

itself, which would probably be formed of carbonate of lime, has, no doubt, in most cases, been removed at a later period, thus causing an additional line of weakness in the slate, owing to which, the subsequent exposure of the cast is very often due.

My best thanks are due to Mr. W. Kinsey Dover, Mr. Peter Harrison, and Dr. Knight, Hon. Curator of the Keswick Museum of Local Natural History, for their kindness in lending me specimens; also to Mr. Goodchild, to whom I am indebted for the drawings on the annexed plates, and for the diagrams used at the Annual Meeting of the Association.

ILLUSTRATIONS OF TRILOBITES FROM THE SKIDDA SLATES, drawn from the original specimens. By J. G. GOODCHILD.

The references within parentheses indicate those fossils referred to in Mr. Postlethwaite's Paper (pp. 71-80) On the "Trilobites of the Skiddaw Slates." The size of each fossil is denoted by the fraction next to the figure.*

1. Impression of Asaphoid Trilobite from "Skiddaw"; redrawn from the original specimen figure pl. xii. of Mr. Ward's Memoir. W. Kinsey Dover Collection.
2. Upper and lower figures, *Phacops nicholsoni*. Drawn from the original type-specimen figured by Mr. Salter in *Quart. Journ. Geol. Soc.* vol. xix. Whiteside. Harkness Collection.
- 3 and 4. Drawn from specimens regarded by Mr. Salter as the same species as the last. "Skiddaw." Wyatt Edgell Collection.
5. Weathered specimen of part of the thorax of a species of? *Homalonotus*. Highside, Bassenthwaite. Harkness Collection.
6. (B2.) Randel Crag. W. Kinsey Dover Collection.
7. *Agnostus morca*. Drawn from the type-specimen figured by Salter. *Q. J. G. S.* xix. Ellergill, Milburn. Harkness Collection.
8. *Agnostus* sp. Ellergill, Milburn. Harkness Collection.
9. (A3.) Part of the thorax of a species of? *Calymene*. W. Kinsey Dover Collection.
10. (C3.) Randel Crag. Mr. Postlethwaite's Collection.
11. (B4.) Buzzard Crag, North-west of Skidda. W. Kinsey Dover Collection.
12. *Æglina* sp. Redrawn from the original of figure 3, pl. xii. Mr. Ward's Memoir (where it is misprinted as *Niobe doveri*). Great Knot, Randel Crag. W. Kinsey Dover Collection.
13. Redrawn from the type-specimen of *Niobe doveri*, Eth. Screes below Randel Crag. W. Kinsey Dover Collection.
14. (B6.) Beneath White Pike. Keswick Museum.
15. *Æglina* sp. "Skiddaw." Wyatt Edgell Collection.
16. (B5.) Outerside. Cabinet of Mr. Harrison.
17. (A1.) Summit of Skidda. Keswick Museum.
18. (B3.) Buzzard Crag, North-west of Skidda. W. Kinsey Dover Collection.
19. *Cybele ovata*, Eth. Figured for the first time from the type-specimen described on p. 112 of Mr. Ward's Memoir. Sandy Beck. 3 miles S. of Cockermouth. Keswick Museum.
20. (B1.) Randel Crag. W. Kinsey Dover Collection.
21. (C1.) Randel Crag. Mr. Harrison's Collection.
22. (A2.) Randel Crag. Mr. Postlethwaite's Collection.
23. (C2.) Randel Crag. Mr. Harrison's Collection.

The outlines figured 24-26 represent trilobites that are said to have occurred in the Skidda Slates; but that could not be obtained for the purpose of the present paper.

24, *Ogygia selwyni*; 25, *Æglina binodosa*; 26, *Æ. caliginosa*; 27, *Trinucleus gibbsii*.

* Further observations on these fossils will shortly be given by Messrs. Postlethwaite and Goodchild, in the *Proc. Geol. Assoc.*

It is desirable that the following note by Mr. T. V. Holmes should appear in the present number of the *Transactions*, while the subject referred to is fresh in the minds of the readers of Mr. Kendall's paper. [EDITOR.]

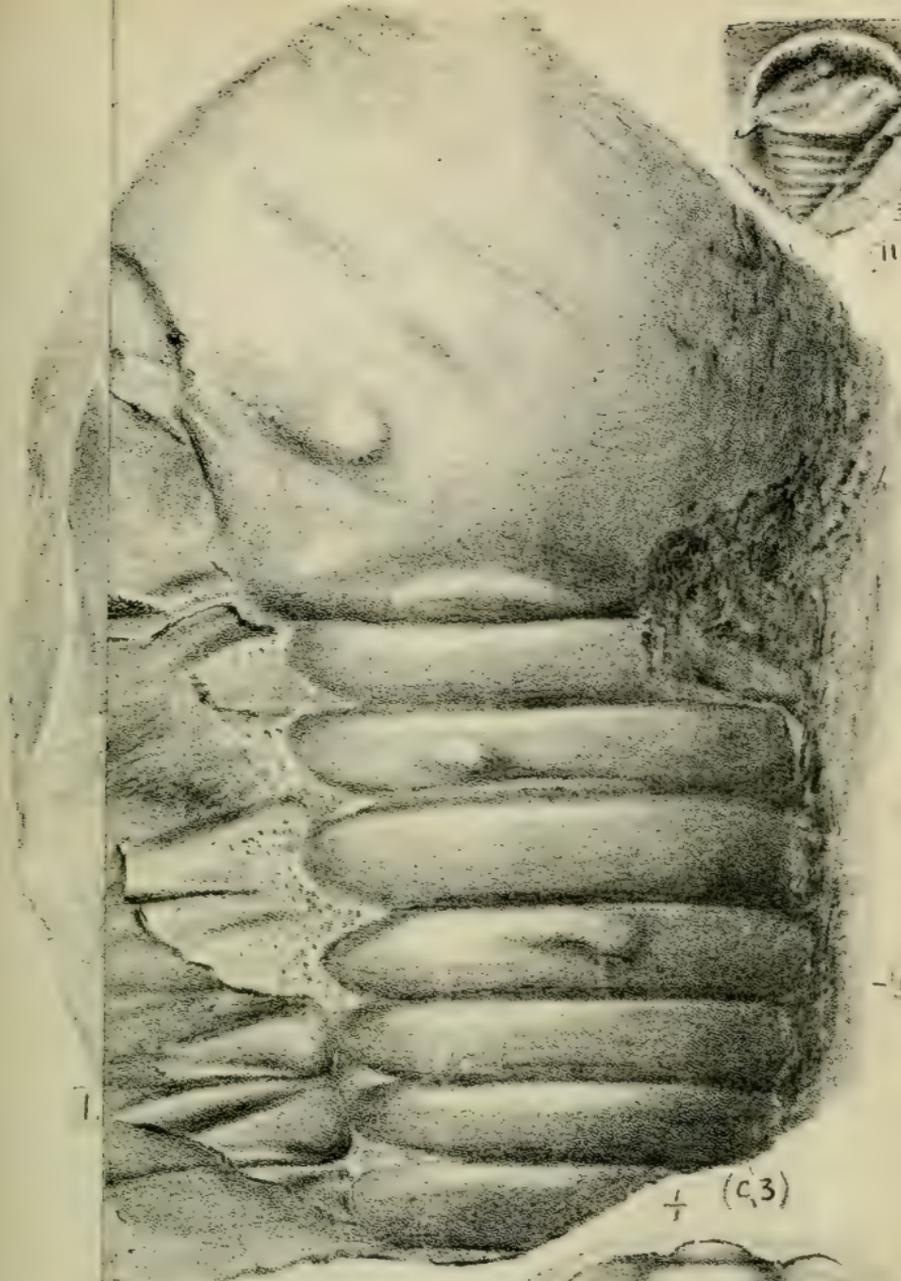
Dec. 1885.

28 CROOMS HILL, GREENWICH,

November, 1885.

Thanks for the sight of Mr. Kendall's remarks. Considering the want of available space in the *Transactions* this year, I am glad to find that there is no urgent need to add anything to what I have already written. On the other hand, I am sorry that Mr. Kendall has not enriched the Trans. Cumb. Assoc. with the plate of sections given by him in Proc. N. Eng. Inst. Min. Eng., and referred to by me in my paper last year, as it would have illustrated better than many pages of writing the difference between our respective views.

T. V. H.



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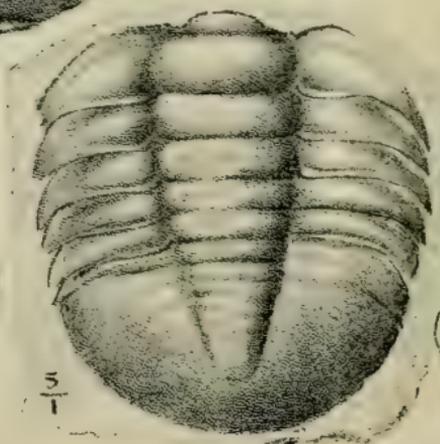
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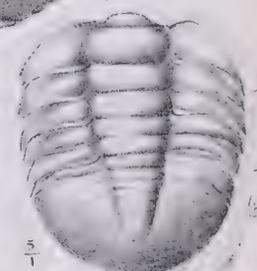
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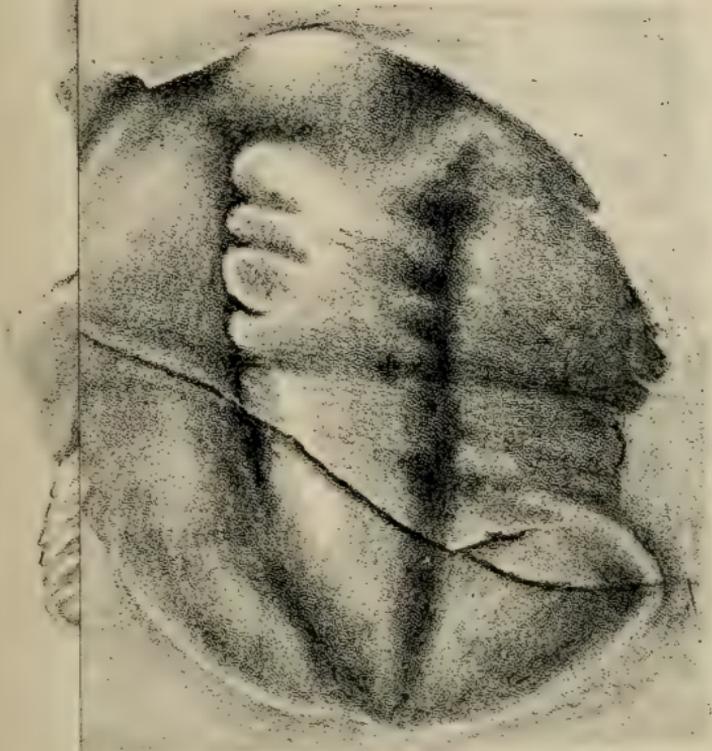
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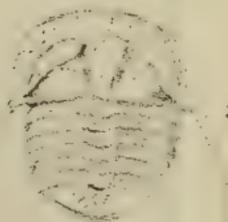
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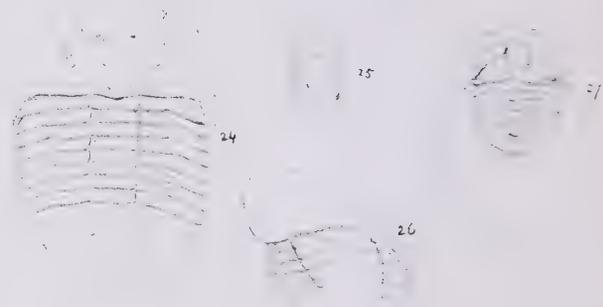
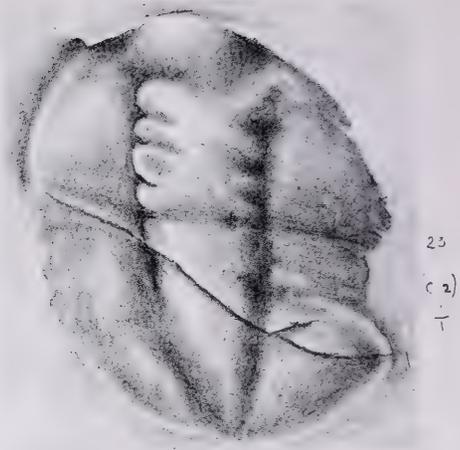
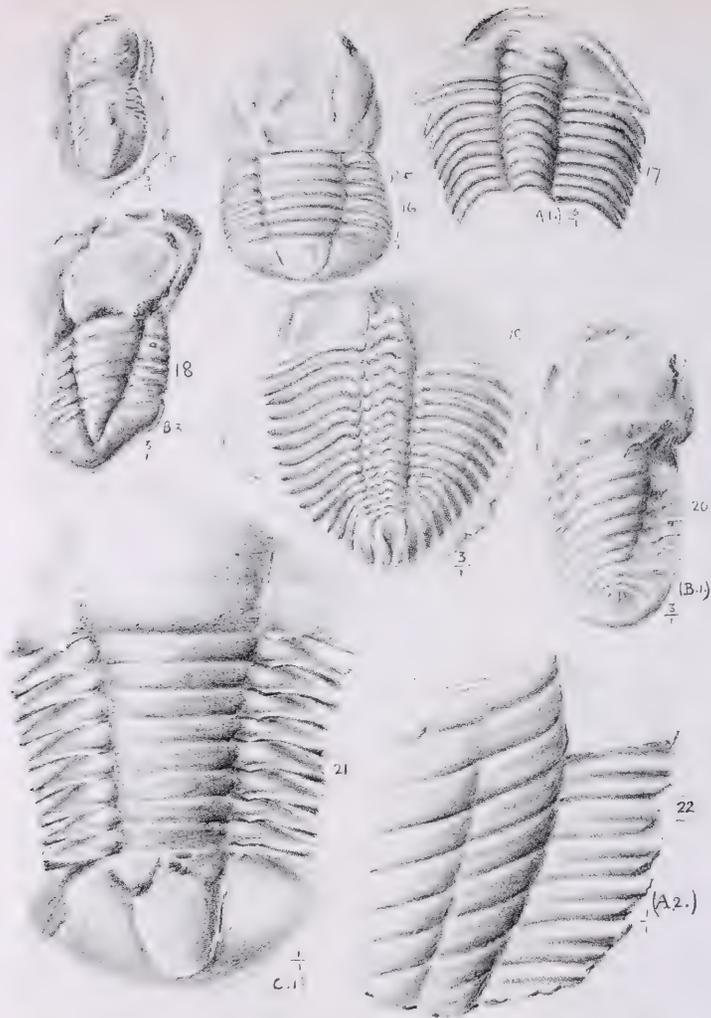
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POTSHERDS AND PIPKINS.

By R. S. FERGUSON, F.S.A.

(Presidential Address at the Bowness Annual Meeting.)

ANTIQUARIES have always afforded a good deal of amusement to other people, for which I doubt if those other people have always been properly grateful; and the collections we form, from Don Saltero's museum downwards, have served as the whetstones for many persons' wits. Sir Walter Scott, himself an antiquary rather than an archæologist, has ridiculed us delightfully in one of the best known of his novels; and Burns has described Captain Grose as having taken up "the antiquarian trade," of which the poet makes out the stock-in-business to be

A fouth o' auld nick-nackets,
Rusty airn caps and jinglin' jackets,
And parritch pats and auld saut-buckets.

The porridge pot business is at the bottom of a good deal that I shall say to you to-day. It is evident that before you can make porridge, you must have a pot of some sort, of earthenware or of metal; and that without one, you would have to be content with cold "crowdy," made in a bag, or in a wooden bowl, or a bison's horn, unless you could warm up the mess by help of a red hot stone.

For my present purpose, I must go back into the very early history of man in this country. I dare say you have heard

of the division of time into the stone, the bronze, and the iron ages. In the first of these, man was ignorant of the use of metal, and his only implements for war, for the chase, or for domestic use, were of wood, stone, bone, or shell. To this followed the bronze age, when man had advanced to the knowledge of weapons and implements of bronze; these did not wholly supersede stone weapons and implements, for the poor man would continue to use the cheaper articles. Next ensued the iron age.

The stone age is again subdivided into two periods,—the earlier or palæolithic age, when man did not know how to grind or polish a stone, but only how to rudely chip it to a rough edge—the later or neolithic, when man knew how to grind and polish a stone. The palæolithic age is again subdivided into two, the age of the river-drift man and of the cave-man.

The river-drift man lived at a period when the whole of this island, including Ireland, as well also as great part of the North Sea, was dry land, and part and parcel of the continent of Europe. His remains have been found not only in southern Britain, but throughout western and southern Europe, northern Africa, Asia Minor, and India, a distribution which makes it certain his age—the age of the river-drift man—was one of great length. But he was a mere hunter, armed with rude stone implements: he had no pottery, or we should have found his potsherds, for they are as little liable to destruction as a fragment of bone or of antler. The river-drift man was the contemporary here in the winter of the reindeer, the lemming, and the musk-sheep. In the spring, summer, and the autumn, he could here hunt the stag, the bison, the urus, the pouched marmot, the woolly rhinoceros, the mammoth, the wild boar, and the hare; but the lion and the spotted hyæna hunted him. He was a man, endowed with all human attributes; he was not a monkey, or an ape, though both English and French professors have suggested that in the miocene age some of the higher apes in France could chip flints, and cut bones.

The river-drift man has perished entirely: he is as extinct as as the mammoth or the dodo.

To the river-drift man succeeded the cave man, who was a hunter, a fowler, and a fisher. His implements, of stone, were superior to those of his predecessor; he was an artist, endowed with the faculty of carving on ivory and other substances animal forms with extraordinary fidelity, and many specimens of his work remain to us. His range was much more restricted than that of the river-drift man—from the Alps and the Pyrenees to Derbyshire and Belgium, and eastward to Poland and Styria. He hunted the reindeer, the horse, the bison, and the mammoth, the woolly rhinoceros, the cave bear, the urus, the musk-sheep, and the ibex. He is now represented by the Esquimos; and the cave man probably disappeared from this country about the time that it became an island, and when its climate changed from an arctic to a temperate one. We know a great deal more about him and his habits than we do about those of his predecessors: we have the Esquimos to go to for explanation of what would otherwise puzzle us. The cave man, again, had no pottery: we have his refuse-heaps and his rubbish-heaps, and not a potsherd among them. But we know how he did without them: we have the Esquimos to tell us; and therefore we say that his vessels for holding water were probably of wood, or skin, or horn. The horns of the bison, the urus, and the musk-sheep would make eligible vessels. He probably, like the Esquimos, made a rude vessel by cementing pieces of stones together with a mixture of fat and lamp-black. Captain Cook saw the Esquimos using vessels made of a flat stone with sides of clay, not unlike a standing-pie. In other instances, they made a hole in the ground, and lined it with clay, or they coated a wooden vessel with clay so as to make it stand heat. No doubt the cave men knew these three simple dodges: and here we have three ways in which pottery may have been invented.

There are races of men even at the present, who have not got even so far as this. The Veddas of Ceylon have no pottery; the Andamanese have none, and use shells and pieces of bamboo, as water vessels. The Australians have none, and use vessels of skin or of bark. The Maories of New Zealand have no

pottery, and use gourds. The Tahitians have no vessels but of wood. The Patagonians use bladders, and the Fuegians vessels of bark.

Of course people who have such vessels cannot boil their food : they can only roast or broil it. If they want hot water, their only way of getting it is by the use of heating stones, or "pot-boilers."

To the palæolithic cave-man succeeded the neolithic man, who could grind and polish a stone. They were a small, dark, long-headed (dolicho-cephalic) non-Aryan people, who are represented to the present day by the small swarthy Welshman with the long head and Iberian physique ; by the small dark Highlander ; and by the black Celts in Ireland west of the Shannon ; but of course they have been much crossed with Celtic, Danish, Norse, and English blood. These dark small men were herdsmen and farmers. The researches of ethnologists and of archæologists have added much to our knowledge of them. They lived in small tribal communities normally at war with each other, like the Afghans and the Kaffirs. I will give an account of a neolithic homestead. Professor Boyd Dawkins says :—

If we could in imagination take our stand on the summit of a hill commanding an extensive view, in almost any part of Great Britain or Ireland in the neolithic period, we should look upon a landscape somewhat of this kind. Thin lines of smoke rising from among the trees of the dense virgin forest at our feet would mark the position of the neolithic homesteads, and of the neighbouring stockaded camp, which afforded refuge in time of need ; while here and there a gleam of gold would show the small patch of ripening wheat. We enter a track in the forest, and thread our way to one of the clusters of homesteads, passing herds of goats and flocks of horned sheep, or disturbing a troop of horses or small short-horned oxen, or stumbling upon a swineherd tending the hogs in their search after roots. We should probably have to defend ourselves against the attack of some of the larger dogs, used as guardians of the flocks against bears, wolves, and foxes, and for hunting the wild animals. At last, on emerging into the clearing, we should see a small plot of flax or small-eared wheat, and near the homestead the inhabitants, clad some in linen and others in skins, and ornamented with necklaces and pendants of stone, bone, or pottery, carrying on their daily occupations. Some are cutting wood with stone axes with a wonderfully sharp edge, fixed in wooden handles, with stone adzes and gouges, or with little saws composed of carefully-notched

pieces of flint about three or four inches long, splitting it with stone wedges, scraping it with flint flakes. Some are at work preparing handles for the spears, shafts for the arrows, and wood for the bows, or for the broad paddles used for propelling the canoes. Others are busy grinding and sharpening the various stone tools, scraping skins with implements ground to a circular edge, or carving various implements out of bone and antler with sharp splinters of flint, while the women are preparing the meal with pestles and mortars and grain rubbers, and cooking it on the fire, generally outside the house, or spinning thread with spindle and distaff, or weaving it with a rude loom. We might also have seen them *at work at the moulding of rude cups and vessels out of clay which had been carefully prepared.*

From this you will see that Professor Dawkins considers that these long-headed neolithic men knew how to make pottery.

He describes their vessels as coarsely made by hand, and composed of clay, in which small pieces of stone, or fragments of shell, have been worked. They are brown or black in colour, and very generally have had rounded bottoms; from which it may be inferred that they were not intended to stand on tables, but were placed in hollows on the ground or the floor. Sometimes they are ornamented with patterns of lines or dots. And in these rude, ill-baked vessels, you have the germs of an art which has culminated in the finely modelled and exquisitely painted vases of the Etruscan Greeks; the majolica ware of Italy; the stone ware of Flanders and of Germany; the porcelain of China and of Dresden; and of many other famous "fabriques" and "bottegas" which I have neither the time nor the knowledge to enumerate, or to instruct you to distinguish between.

I shall confine myself to the four great divisions into which the history of the Ceramic art of this country is to be divided—*The Celtic, The Romano-British, The Anglo-Saxon, and The Mediæval.*

THE CELTIC AGE.

The greater part of the pottery that has come down from the Celtic age is sepulchral in character, and it is divided into four classes, which have been named "cinerary urns," "incense cups," "food vessels," and "drinking cups." Now, it should be noticed that all these four classes differ in a marked manner from the

fragments of domestic pottery found about the habitations. Both are made of clay mixed with broken stone ; sometimes nearly half the paste consists of broken stone—such stone as is usually found in the neighbourhood—and varying in size from grains of sand up to that of a pea. This was done with an object—to prevent the unbaked vessel from losing its form, and to prevent its cracking while it was being baked ; for these vessels have all been baked, not in a kiln, but before an open fire. If they had been merely sun-dried or sun-baked, as many writers have said, they would long ago have returned to their constituent elements. They are always hand-made, the potter's wheel being then unknown.

The difference between the *sepulchral* and the *domestic* vessels is that the former are highly ornamented : the latter are plain and strong ; they are also generally round-bottomed, which shows that their owners did not use tables, and consequently did not use chairs. They probably squatted on their hams, and placed their vessels in hollows on the ground, and took their food from them with their hands, or with a spoon of bark or of wood, or of shell.

From the character of the paste of which these utensils are made, it is obvious they could not be used for cooking. If their proprietors were acquainted with the art of heating water, they did it by a "pot-boiler," or large stone heated red hot in the fire, and then dropped into the water. These stones are often found, and are generally much cracked. They are used to this day in remote parts in Scotland.

Now there is another fact we can gather about our Celtic friend who used this pottery. He must always have had his milk tainted, and as use is second nature, he probably liked it "gamey," and preferred it to fresh milk. Similar pottery is still made and used in the Isle of Lewis, and called "craggans." In consequence of their porousness, the "craggans" generally contain organic matter in a state of putrescence. When fresh milk is poured into a craggan, it almost immediately becomes tainted, and thus where craggans are much used, there is a difficulty in getting fresh milk, whose taste thus becomes unfamiliar, and people soon get to like best

what they know best. This is what happens in the Lewis, and I have no doubt was the case in the prehistoric ages.

I have shown you a little of what we learn from this pottery of its owner's domestic habits. Let us see what these potsherds will tell us of their religion.

His sepulchral vessels have been classified thus: cinerary urns, incense cups, food vessels, and drinking cups; but this is purely a conventional nomenclature, and you must be very cautious about drawing conclusions from the names.



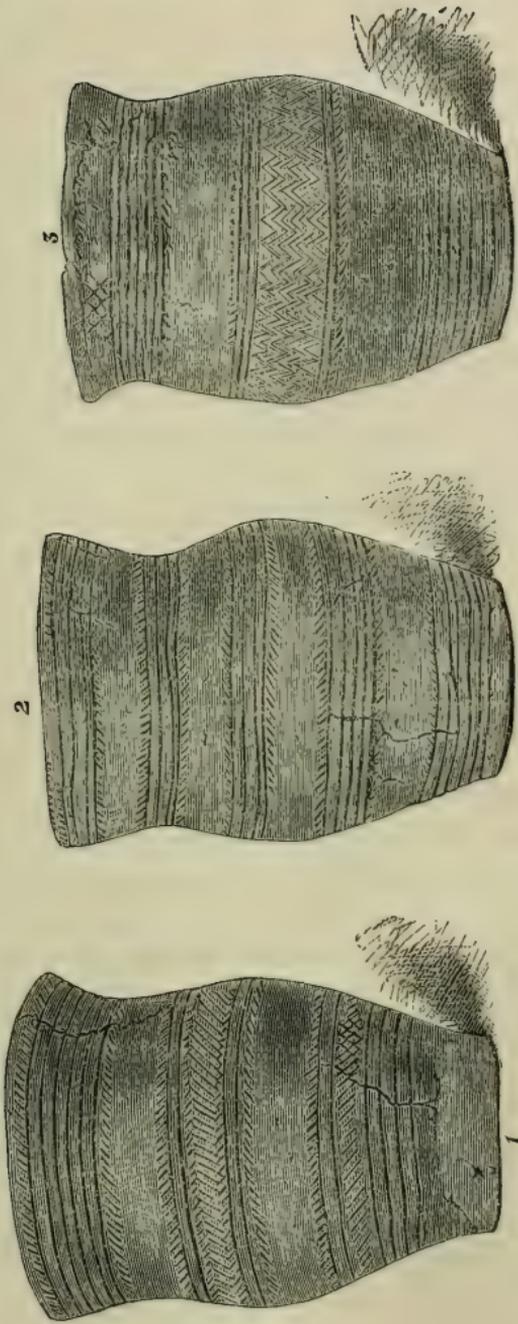
CINERARY URN.

1. The cinerary urns contain a deposit of burnt bones, and in the museum at Carlisle there are some very fine examples, which were found at Garlands, during the building of the large asylum

there. Their commonest shape is that of two truncated cones, inverted one upon the other, so that the mouth is rather contracted, and the upper cone, by overlapping the other, forms a deep rim by which some think it is intended to be lifted. This overhanging rim is the chief mark of the cinerary urns; and it is probable that when the jar was full, a piece of skin or of cloth was placed over the mouth, and tied by a cord or withy under the overhanging rim. In fact, its use is the same as that of the groove round the top of a jam pot, only, the string or withy then used, would be much coarser than that now used by ladies in securing their preserves. Occasionally the urns have handles; for I doubt if the rim would serve to lift them by without breaking.

The ornamentation of these vessels is worth attention: *it is the very earliest dawn of art.* Our present art has no connection with the ivory carvings of the cave-men, but is to be traced from this pottery. The ornamentation of these vessels has never been found to exhibit any representation of either animal or vegetable life. It consists principally of combinations of straight lines in an almost inconceivable variety. The finger nails have frequently been the only tools employed; at other times a piece of hard wood or of bone has been used, sometimes just a simple point, at other times notched, or cut into alternately sunk and raised squares. Most frequently a twisted thong has been used, sometimes of leather, sometimes of some vegetable fibre, with two or three plaits. Curved lines and circular marks occur, but the patterns are generally made up of straight lines arranged in cross, zig-zag, chevron, saltire, reticulated, and herring-bone fashion.

2. The second class is that of the incense cups. They are very small vessels, from an inch to three inches high, and from one inch to four in diameter. They are of very various shapes, and frequently have holes in them, sometimes as many as twenty-seven. They are generally of finer clay and more ornamented than the cinerary urns. They are only found with burnt bodies, and sometimes inside the cinerary urns. They were first called "incense cups" by Sir Richard Colt Hoare; but



URNS (CLASS 3 AND 4) FROM CLIFTON, WESTMORLAND.

their real use is much disputed ; the most probable idea is that they were chafers in which a piece of lighted touchwood was carried for the purpose of igniting the funeral pyre : the holes would cause a draft, which would keep the touchwood burning.

3 and 4. The food vessels and the drinking vessels are rather hard to discriminate between : some are undoubtedly drinking cups ; others may be either. They exhibit great diversity of form. They contained some provision for the departed brother on his unknown journey, and the fact that such provision was made proves that the race who made this pottery—the ancient Britons—had a belief in a future state. As we also find weapons buried with the bodies, their notion of a future state was that it probably was one like that the deceased had just gone through, and in which he would again require his weapons of war and of the chase, and would still wear his decorations of beads and bones.

Before I leave this the first or Celtic period, I will recur to the “craggans,” which I have before mentioned. These “craggans” exactly resemble the domestic division of this Celtic pottery, which is unornamented, and is better baked than the funeral stuff. The craggans are made to this day on the Isle of Lewis, and Professor Mitchell thus describes the making of one by a woman at Barras, whom he engaged to show him the process of manufacture.

This she duly did. The clay she used underwent no careful preparation. She chose the best she could get, and picked out of it the larger stones, leaving the sand and the finer gravel which it contained. With her hands alone she gave to the clay its desired shape. She had no aid from anything of the nature of a potter's wheel. In making the smaller craggans with the narrow necks, she used a stick with a curve on it to give form to the inside. All that her fingers could reach was done by them. Having shaped the craggan, she let it stand for a day to dry, then took it to the fire in the centre of the floor of her hut, filled it with burning peats, and built burning peats all round it. When sufficiently baked, she withdrew it from the fire, emptied the ashes out, and then poured slowly into and over it about a pint of milk, in order to make it less porous. The craggan was then ready for use and sale.

This was no doubt the method employed by the prehistoric

women in making the pots I have here, only a little more care has been given to the ornamentation.

And here Professor Mitchell administers a caution to archæologists, which I will tell you. This woman at Barras lived in a wretched hut, much such as the prehistoric Britons lived in. She had in it cottons from Manchester, crockery from Staffordshire, cutlery from Sheffield, sugar from the West Indies, tea from China, and tobacco from Virginia, yet she used craggans, and a quern, and spun wool with a wooden spindle on which was a stone whorl. Now if you were to bury her, house and all, and dig her up in a century or two, the cottons, the cutlery, the sugar, the tea, and the tobacco, would have disappeared. Her bones, her spindle whorl, her quern, and her craggans would alone remain, and some of the Staffordshire crockery; the antiquary who dug her up would certainly conclude she was a prehistoric Briton, and would say the Staffordshire potsherds were a later deposit. Yet she was living in 1863.

THE ROMANO-BRITISH.

The Potter's Wheel.—I now come to the second of the great divisions which I mentioned to you—the Romano-British.

Vast quantities of pottery, unquestionably the production of the Roman period of British history, are continually found in all parts of the kingdom. Numerous potteries existed, some, as at Upchurch on the Medway, of very large extent; the very kilns in which the ware was manufactured, have also been discovered in many places, and it is certain that a large proportion of the fictile works used in this country were also made in it; and that an export trade in them existed with Gaul.

The pottery of this period differs in every respect—in *shape*, in *ornamentation*, and in *paste*, from that of the preceding period. The Romano-British potters knew also the use of the potter's wheel, which was unknown in the British period. I am unable to tell you anything of the history of the *potter's wheel*. Its invention goes back into remote antiquity; I think I have seen it on the walls of some of the tombs at Thebes. The Egyptians

certainly used it, and the Romans doubtless brought it here, by way of Gaul.

It consists of a circular disc, or solid wheel, revolving horizontally. On this the "ball" of prepared clay or paste is placed, and the "thrower," as the workman is called, puts his thumb, or his fist, into the middle of the clay, and forms the vessel by hand, and by wooden or metallic guides. The rotation of the wheel thus ensures the vessel being symmetrical in shape, that its horizontal section is a circle. The wheels are now generally driven by steam; formerly a boy or girl turned each wheel by hand. But I fancy at first the potter himself worked the wheel by a treadle, as one works a spinning machine, except that the wheel would be horizontal and not vertical. I can't tell you the history of the potter's wheel, or who invented it. But the inventor of the treadle motion was one of the greatest benefactors mankind has ever had. The potter's wheel, the spinning wheel, and the lathe, all depend on it.

The use of this machine gives a great superiority to the pottery of the second period, and constitutes a marked difference between it, and that of the first period. Another difference is in the *paste*: the clay is carefully prepared, and the stones and sand are not left in. When baked the paste is hard, and brittle, and sonorous; it is not porous, and the vessels are light and thin.

The commonest kind of Roman pottery, of which we find potsherds, is the Upchurch ware from the great potteries on the Medway, which extended for seven miles long by two or three in breadth, and from which all Roman Britain, and part of Gaul, was supplied with most of its kitchen pottery. This pottery is of a fine hard texture, and generally of a blue-black colour; sometimes greyish-black, and sometimes drab: the colour is due to its being burnt in *smother kilns*. The forms of these vessels vary amazingly, and they are graceful and elegant. The ornamentation is mainly circles and semicircles, vertical and other lines, raised dots, etc.

Another class of Romano-British ware is the Caistor or Durobrian, a blue-black ware made at potteries on the river Nen. It

bears figures of men and beasts, and various ornaments in relief. They were put on in "slip," that is, after the vessel had been formed, or "thrown," on the wheel, it was allowed to dry, and then "slips" of the same paste, or of a white paste, were trailed on from instruments and formed into figures. Hunting, gladiatorial, and circus scenes frequently occur.

The Salopian ware was both white and light red, and there were many other local varieties.

But the best known is the Samian ware, whose potsherds, from their brilliant colour, attract the eye and are gathered up, where the blue-black are overlooked. The Samian ware is of a delicate texture, much like fine red sealing-wax. It is very brittle, and as it was the ordinary Roman table-ware, this accounts for the abundance of its potsherds. The vessels of it are generally bowls, cups, and *pateræ* or dishes. Sometimes the vessels are quite plain; at other times highly ornamented in relief, by means of stamps. Borders of ivy leaves; of the egg and tongue ornament; of the tassel and festoon; and of small patterns of foliage and flowers, frequently occur. Mythological subjects are common; sacrifices, religious ceremonies, processions, dances of bacchantes and satyrs, combats of gladiators, sports of the amphitheatre, etc., are all represented; and from potsherds of Samian ware we can gather much information as to Roman dresses, observances, and customs; and some indicate a very low tone of morality. On Samian vessels we sometimes find reproduced celebrated works of famous artists: thus on a potsherd of Samian ware, found in Carlisle, Mr. Cory discovered a reproduction of the famous statue known as the Venus de Medicis. On a potsherd in the Carlisle museum is a representation of the battle of the pygmies and the cranes. In another is a spirited boar-hunt—a vast wild boar charges a man on horseback, while a dog attacks the boar.

The potters who made this ware have generally put their stamps on it, giving their names. A list of names found in England, to the number of over 1000, was made by Mr. Wright, and new names are daily added to it. From these names antiquaries

have been able to infer that this Samian ware was mainly made in Gaul, on the banks of the Rhine.

We have proof that Samian ware was expensive in the fact that fragments are often found, which have been broken, and mended with leaden rivets by the Romans themselves. Such have been found in Carlisle.

Another class of Romano-British potsherds consist of the fragments of large jars, of a coarse grey or drab colour, which we generally call *amphoræ*, or wine jars. But this name is incorrect, or rather we include under it many large jars of which the *seriæ* are the most common, while an *amphora* or its potsherds are very rare. These *seriæ* were employed for many other purposes than holding wine; they were used to hold oil, honey, pickled salt fish, sardines, figs, vinegar, dried meat, etc.

Another class of Roman vessels is the *mortaria*, which were used in the kitchen for pounding vegetables in with a pestle. They were shallow dishes, with a mouth at one side for drawing off the water, and their potsherds frequently occur.

The multiplicity of potsherds that occur about a Roman site, shows that the Romans must have used large quantities in their houses. They used it largely in their kitchens, and for their table: they used it where we use wooden casks, for wine, etc.; and they also used it as receptacles for money and little articles, where we use boxes, baskets, bags, and work-cases.

Did nothing remain to us of the Roman in Britain, but the potsherds they have left behind them, yet those alone would tell us much. We should know that they had made cookery one of the fine arts, that their tables were luxuriously served; we could infer much as to their mythology and their religion, as to their games and sports, their ceremonies, their dresses, and their furniture. We should know, too, that concurrent with high refinement and artistic culture, there existed a want of morality hardly conceivable by us.

We should almost be able to recover the works of some of their greatest sculptors.

THE ANGLO-SAXON PERIOD.

Of the pottery of the Anglo-Saxon period I have very little to say. It rarely, if ever, occurs here. In paste, form, and ornament, it exhibits a falling off from the Romano-British period, and it is hand-made, without the use of the potter's wheel. It is very markedly different from the pottery of the first or British period.

The examples we have of Anglo-Saxon pottery are few, and almost all cinerary urns. Our English ancestors mainly took their food out of wooden or metal bowls, and drank out of horn or glass, so that they required little pottery. They were a coarse-feeding, hard-drinking race, who gorged themselves on ill-cooked meat, and then got drunk on mead or beer, which was supplied to them in buckets. Their drinking vessels are round at the bottom, so that bumper glasses were the rule, and heel-taps not allowed.

Their cinerary urns accompany burials by cremation. They are contracted at the mouth, and have a neck instead of the overhanging rim, which marks the Celtic period. They were hand-made, and frequently have great knobs on the exterior; also small punctured ornaments, made by a stick cut and notched so as to make a cross.

THE MEDIÆVAL.

With regard to Mediæval pottery, in England, both in Norman and Tudor periods, it consisted largely of bowls, and dishes, and of pitchers; the first being used for placing the cooked meat in, the latter for holding and carrying wine, ale, mead, and other liquors to table; but these were made in no great abundance. Other materials were in use: *treen*, or wooden trenchers, were used by the poorer, and pewter by the wealthier. A garnish of pewter—which was I believe thirty-six round plates of different sizes—was a mark of respectability and position. For drinking, silver and pewter flagons, mazers of maple wood, rude cups of ash, and black-jacks of leather, were in vogue. Earthenware—such as it was—was expensive, and was mounted with silver for those who sat above the salt; as for those below, and as for servants, the

household book of the Duke of Northumberland in 1512 orders that "*ledder pots* be bought for those serving for liveries and meats in my lord's house." Thus in collections of mediæval earthenware, it is rare to find dishes or small drinking cups; they generally consist of pitchers of various sizes and shapes, suitable for bringing large quantities of liquor to table at once: even these are rare.

In regard to elegance of form and fineness of material, they exhibit a great falling off from the manufacture of the Roman period, when even vessels of the coarsest clay had a pleasing effect.

Costrels, and cruces, and jeroboams, and jacks, and kitties, and greybeards are among the various names by which mediæval pottery was known. The costrel was a bottle with ears on either side of the neck, by which it could be slung with a string; a cruce was a little drinking cup; the greybeards, or longbeards, or Bellermines, were stone pots or jugs with a spreading belly and a narrow neck, on the top of which was represented a rudely executed face with a long flowing beard. These were called Bellermines after the celebrated Cardinal Bellermino, who was the object of much protestant satire; he was a short, stout, pot-bellied man, of hard features, and he must have been ugly indeed, if the portraits on these jugs are like him.

There is a broad distinction between the pottery I have been describing to you, and the mediæval pottery—that lies in the matter of *the glaze*. The Celtic pottery is unglazed.

The Roman pottery found in this country is either, like the *amphora*, unglazed, or is polished, which its hard paste admits of; or is glazed, like the Samian ware, with a coat of some sort of glass, put on so thinly as almost to defy attempts to analyse it. It is mainly absorbed into the ware, and leaves only a faint polish on the surface.

Glaze is a covering or coating applied to porous ware to make it capable of retaining liquids. And glaze is of two kinds—vitreous or glass glaze, and plumbeous or lead glaze, both of which are translucent. Enamel or tin glaze is also used for the same purpose, and is white and opaque. Copper also produces a brilliant blue

enamel. The use of copper for this purpose was known in Assyria and Babylonia at a very early period; so was the use of tin; but the art was kept a secret among the Eastern nations, and ultimately became lost until rediscovered in Europe in the fifteenth century.

The use of the vitreous or glass glaze was well known to the potters of the East, of Egypt, of Greece, of Etruria, and of Rome, and was used by them on many of the noblest productions of the potter's art. The Persian, Damascan, and Rhodian wares are of this class.

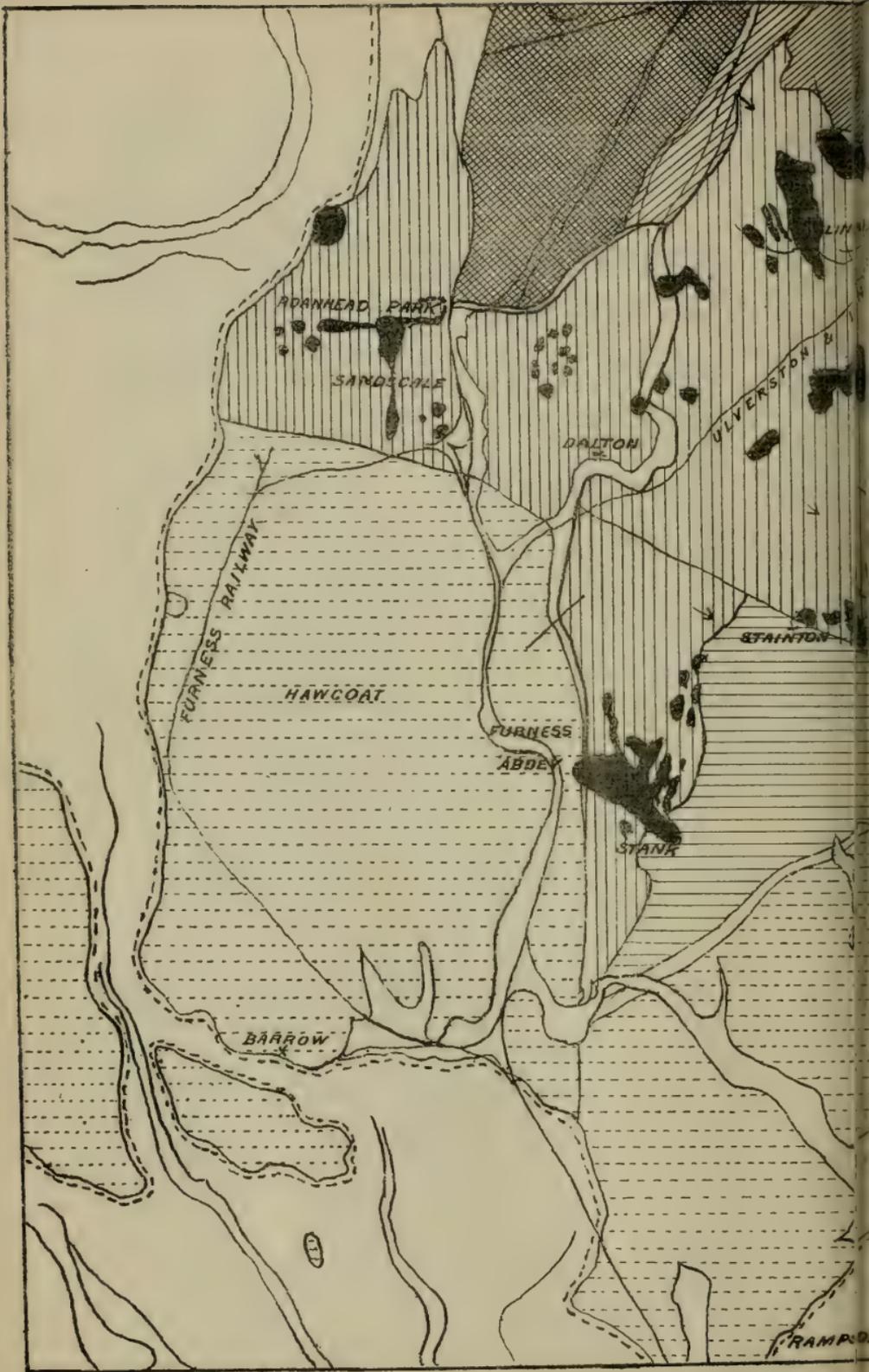
The plumbeous or lead glaze is the characteristic of mediæval pottery; it is made of silica with potash or soda, and oxide of lead. It is generally green; and green-glazed ware may generally be set down as mediæval, but not always, as has been pointed out by both Mr. J. E. Price, F.S.A., in his tract on "London Wall," and Mr. Wellbeloved in his "Eboracum." A remarkable instance was found in building the gaol at Carlisle, fifteen feet below the surface, and underneath Roman refuse. The process therefore was known to and used by the Romans; but for all that, this lead glaze is the mediæval characteristic.

Now I propose to stop here. To bring my "Potsherds and Pipkins" at all into an evening's compass, I have had to lop off many interesting branches. I have confined myself to the practical—very much to the culinary uses of pottery; and for those uses, and for funeral purposes, it was first employed. I have carefully avoided the artistic and æsthetic aspects of my subject matter: I don't quite know where they would have led me to. I have had no time to go into the pottery of the East, of Greece, or of Etruria; and have refrained from mentioning Majolica; and I have not even alluded to the marks on modern China. I have stuck to my Potsherds and Pipkins, such as you may find in or about Carlisle. I claim for Potsherds and Pipkins a higher value than you may be disposed to give them. Sir Samuel Baker says, "Nearly all savages have some idea of earthenware; but the scale of advancement of a country between savagedom and civilisation may generally be determined by the examples of its pottery."

“Potsherds,” says another authority, “to the ethnologist are not less valuable than the characteristic fossils by which the geologist determines the ages of the relative underlying strata.”

Trivial as potsherds may seem, they are milestones, which mark the progress of civilisation. Vast must be the gap, and vast is the gap in point of culture between the maker of these rude cinerary urns and the maker of a piece of majolica ware. And yet the one is the parent of the other. And the rude marks on these urns are the first dawn of our highest art. And if potsherds are the milestones of civilisation, yet the art of pottery has contributed much to help civilisation. In the struggle for existence which goes on in the animal world, the outcome is that the strong are selected for survival; the weak die out. This is the law of natural selection; and man is subject to that law, like all other animals. But with that law of nature man in society continues to wage a successful warfare; animals do not. The outcome of that war—a war waged with nature to prevent her putting into execution in the case of man her law of natural selection—is civilisation. And one great way in which man defeats that law and keeps alive the asthmatic, the bronchial, the rheumatic, the gouty, and the other pets of the doctors, is by the art of cookery; and I think that I have shown you that without pots cookery would be at a very low ebb, and that those who had indifferent pots had but indifferent cheer. Thus the potter’s art not only marks the progress of civilisation, but is one of its most valuable allies.





ADANHEAD PARK

SAND SCALE

DALTON

ULVERSTON R.

FURNESS RAILWAY

HAWCOAT

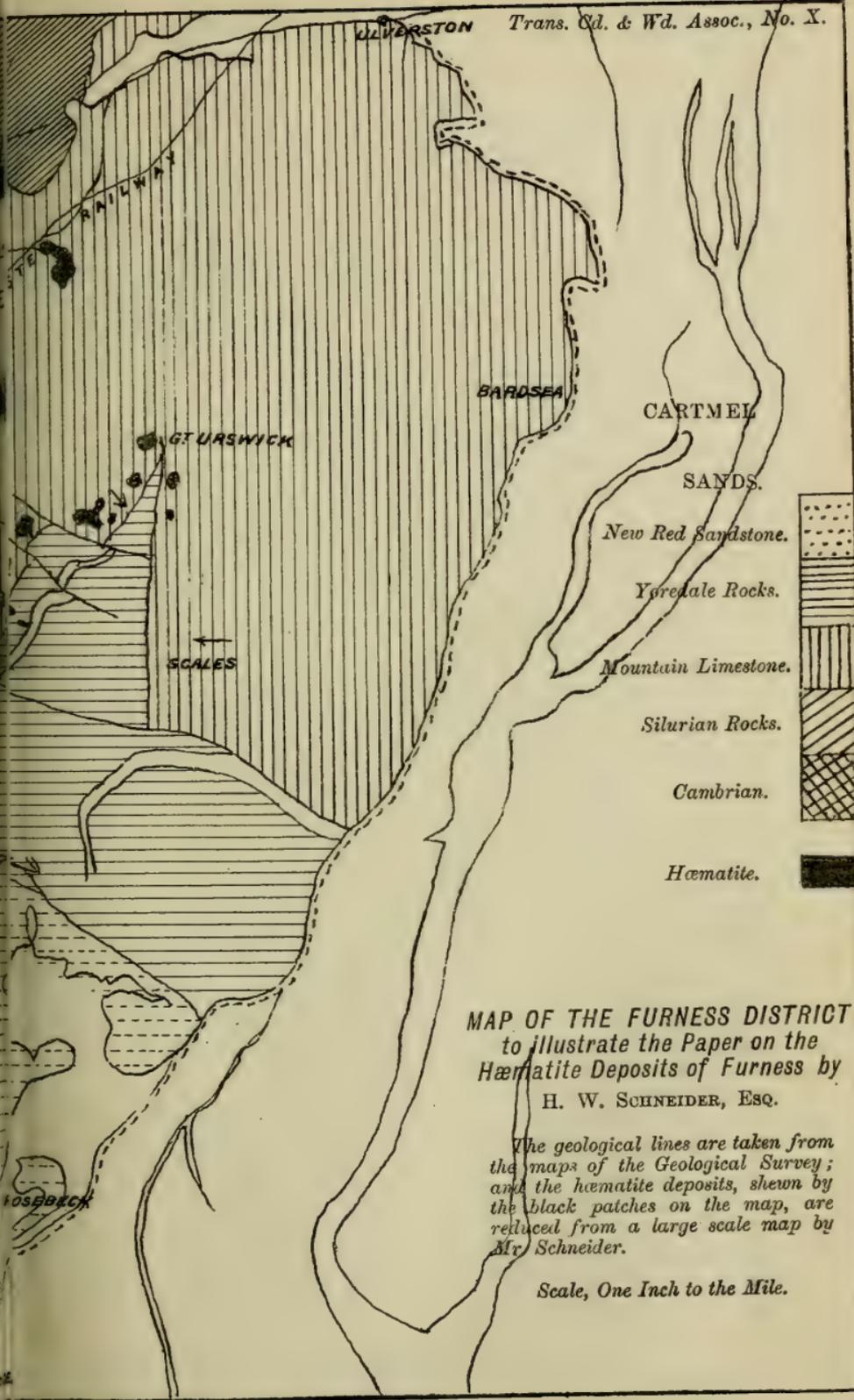
FURNESS ABBEY

STAINTON

STANK

BARROW

RAMP



MAP OF THE FURNESS DISTRICT
 to illustrate the Paper on the
Hæmatite Deposits of Furness by
 H. W. SCHNEIDER, Esq.

The geological lines are taken from the maps of the Geological Survey; and the hæmatite deposits, shewn by the black patches on the map, are reduced from a large scale map by Mr. Schneider.

Scale, One Inch to the Mile.



ON THE HÆMATITE IRON MINES OF LOW FURNESS.

BY H. W. SCHNEIDER.

(*Read at the Bowness Annual Meeting.*)

IN the Furness District the apparent irregularities of the strata are beyond measure bewildering, and Professor Sedgwick and several other eminent geologists have in vain attempted to solve the difficulties they present. Theories, again, as to the origin of the Hæmatite itself, are so various, and so irreconcilable with one another, and with observation, that all is yet hazy and undetermined. It is the object of this paper to contribute something to the facts already accumulated, from which competent geologists may deduce the conditions under which the Hæmatite has been deposited. It is unnecessary to say that such a discovery would render Hæmatite mining, which is now a matter of chance, a science of certainty and exactitude, and by cheapening production, would confer infinite benefit on the Furness District.

Whether Hæmatite be a water formation, or the result of volcanic action, none can say. There appears, however, to be one general law concerning it—and the only law which, up to the present time, has been found consistent in working the Hæmatite mines, viz:—*That the largest masses of ore are found at the junction of the Clay Slate and the Mountain Limestone.* Yet these deposits are so irregular in shape and position, that it would appear utterly impossible to indicate any law regulating their formation.

Another point, however, deserves attention, viz:—That to the south the Mountain Limestone dips below the New Red Sandstone, and to the S.W. beneath the shales and sandstones of the Yoredale Rocks.

The Low Furness Hæmatite Ore District is comprised within a very limited area, and is of a very irregular shape, as may be seen roughly delineated on the map to illustrate this paper.*

In some cases the ore is merely covered by a few feet of drift; in others it is found in the solid limestone rock. In some places the limestone rock surrounding the ore is perfectly free from any stain of iron; in others there are thousands of yards of rock without any appreciable quantity of ore, and yet every crevice and seam of this rock is stained with the red of hæmatite.

The most ancient mine in Furness is Whitriggs. Here ore was quarried near the surface, and smelted into iron in charcoal fires, or Biscayan Bloomeries (similar to the method used in Spain,) many years prior to the Reformation. The earliest mine, however, that in modern times has been profitably worked in Furness, is Lindale Moor, belonging to Messrs. Harrison, Ainslie and Co., whose predecessors have worked this mine for a very long period. In this mine the ore lies on the N.W. in close proximity to slate rocks, and there is a solid mass of ore, with nothing but drift as a cover, which extends in places from thirty to forty, fifty, and even a hundred yards wide, and is some seven or eight hundred yards in length. This mass of ore was found for many fathoms in depth, when it was apparently cut out by a bed of rock, and it was supposed that the life of this mine was ended. But further investigation in depth proved that this bottom of limestone was of no great thickness, and ore was again found beneath it. As time progressed, and improvements were made in the mode of working, this large mass of ore was developed to the south, and at the present time the mine, still producing an enormous quantity of ore, is about a mile in length. But over its whole length and breadth there is nothing to show any regularity of formation, or anything to indicate any system by which further ore should be discovered. In fact in this mine, as in all other mines in Furness, the discovery of ore seems to be a mere matter of chance. It frequently appears where least expected; and where most expected, is not found.

[* See also the Geological Survey Maps 98NW. and SW., 99SE., 91NW., and the Memoir thereon. ED.]

In close proximity to the Lindale Moor is the Whitriggs Mine, and to this the same remarks apply. There is nothing to indicate with certainty the presence of ore. The search is made by driving a heading across the apparent run of deposits, which is N.W. and S.E., so that if there be ore it can scarcely be missed. Yet in driving these headings, cases have arisen in which ore has been discovered in veins of from only two to six inches wide, and therefore neglected; and then perhaps years afterwards, when further exploration has been made, large masses of ore have been found on one or other side of the original drift, and have been missed simply by a few feet.

The Whitriggs Mine, and the runs of ore in connection therewith, and which cover many hundred acres, are still in working, and hitherto no bottom has been found to the ore. The only peculiarity of the mine is that the ore is found nearest to the surface at the N.W., and deepest at the S.E.

Leaving Whitriggs, we traverse to the S.W. a country in which the occurrence of ore is very irregular, and the mineral itself of little value, until we reach a place called Mousell, where we come upon one of the most remarkable phenomena of the district. Here the ore is apparently of a different formation, and is found in the limestone rock in holes of the form of a half-globe, with the convex side downwards, and these pots are covered simply with sand, and what is called "pinnel," and with other gravelly matter. In most cases the limestone surrounding these pots is on every side perfectly free from any stain of ore. The Mousell district is small, being only about two hundred acres in extent, and yet has produced ore to the amount of several millions of tons. Large quantities have been found so near the surface that, when some five to fifteen feet of gravel has been removed, the ore has been extracted by open quarrying.

In direct line from Mousell we come to the great mines of the district—Park and Roanhead. The slate rock makes a sharp turn, throwing in a kind of wedge between Mousell and Park. Round the edge of this point indications of iron ore exist universally; and in one point there is a great mass of lime-

stone thrown up, about three-quarters of a mile in length. Every joint and seam of this limestone is stained with iron ore; and in some cases the stain penetrates into the limestone to the extent of three-quarters of an inch. Yet in no one single point—and the reef has been diligently searched—has a single barrowful of ore ever been found.

To the N.W. a valley intervenes between these mines and the limestone on the opposite side of this valley, which is only about two hundred yards wide, large masses of limestone are again thrown up, vast quantities of which have been taken in connection with the works at Barrow for smelting purposes. Every seam and joint of this rock, too, is stained with iron, yet in no single case has ore been found. This rock lies exactly to the south of the great Park Mine, and where it dips and slopes to the back of the valley, the ore is found. Between this and Mousell the slate rock comes in, and underlies at an acute angle the ore which is here found.

Lying as they do on the opposite side of the valley, these mines somewhat alter their run, and instead of trending N.W. and S.E., they go W.S.W. and E.N.E. Their formation is most irregular. In places large masses of rock jut out into the ore. In other cases large masses of ore project into the rock; and the formation is equally irregular on both sides of the mines. The ore varies in width from one to three hundred yards, and the total length is about one thousand yards.

The workings have not reached a sufficient depth to show what the ultimate result will be; but from experience which has been hitherto acquired at one hundred and twenty fathoms, it would seem likely that at a greater depth, the slate rock on one side, and the limestone on the other will meet, the slate dipping below the limestone, and the ore will thus be cut out. At the E.S.E. end, the ore in one place is within thirty feet of the surface, and with nothing but drift over it. But to the W.N.W. there is a depth of forty fathoms before the ore is reached. In this forty fathoms some drift exists near the surface; then comes a huge mass of red clay, and beneath this, white sand. The rock, which is level with the ore to the E.S.E., is very much above it to

the W.N.W. In fact, while the fissure—although its sides are irregular—remains apparently the same, the ore, lying between walls of solid limestone, is twenty fathoms below the top of the rock at one end, whilst it is level with the top of the rock at the other end.

After the main fissure is passed, branches of ore break off in two directions, one trending N.W. to N., and the other trending nearly south.

These mines were discovered in 1851, and have now been in working for thirty-four years; and during this period from ten to twelve million tons of ore have been extracted. They are very irregular in the quality of the ore, and the shape and direction of the pocket is very uncertain. The best of the ore in the centre of the big mine runs up to 63 % of iron oxide, or 90 % of oxide of iron, whilst the bulk of the ore to the S.S.E. of the mine does not contain more than 70 to 80 %. Where the mine branches off into two different directions (see map), the ore in places falls in per centage as low as 60 % oxide, and here there is a large per centage too of manganese.

The limestone continues apparently free of ore for about half a mile due west. In all this ore-bearing rock the clay occasionally seems glazed with ore, but in no case has any discovery of workable quantities been made in the clay. The limestone then dips under the New Red Sandstone, and of course all hope of iron ore ceases to exist.

To the south of these mines we find, as we approach Furness Abbey, the New Red Sandstone again overlying the Mountain Limestone. But at a few hundred yards past the Abbey the Mountain Limestone again reappears, and half a mile further south, the ore-bearing limestone is met with. Here two mines are working—Yarlside, nearest to Furness, and south of this, Stank. And here too a remarkable phenomenon presents itself.

Near the junction of the two mines the Yoredale Shale appears, the Mountain Limestone dipping under it; and at Yarlside the ore is found nearest to the surface in limestone rock. At Stank the following strange circumstance occurred.

Very many years ago, at some period of which no record exists, two pits were sunk to a depth of twenty fathoms, with the object, it would seem, of discovering coal. None, however, was found, and they were abandoned. After the Yarlside mines were discovered, the then owners of Stank determined to reopen one of these two pits. As they were in close proximity, it was a question which pit should be selected, and by mere accident, and as was subsequently proved—by a strangely fortunate accident, one was chosen; and after passing through the shale, it reached the limestone at the depth of about sixty fathoms. The appearance of the rock, from the very moment it was reached, so indicated the presence of ore, that the shaft was continued; ore was found, and the shaft was ultimately sunk to the depth of one hundred and thirty fathoms. Subsequently the other shaft was sunk, but simply for drainage. At about the same depth as in the first pit, limestone was reached; but this limestone, instead of being mountain limestone, was apparently magnesian limestone*—blue in colour, solid in formation, and without any trace of iron ore. And this formation has been found continuous down to the same depth of one hundred and thirty fathoms. So that if this second shaft had been selected instead of the other, the Stank Mine would not have been discovered, because the limestone in this second shaft was so utterly unlikely to lead to iron ore, that the works would at once have been abandoned. Lastly, when we state the mass of dolomitized limestone does not appear to be more than twenty fathoms in diameter, and that its form is almost circular, we have mentioned perhaps the strangest peculiarity of this singular mine.

The Stank Mine has been worked for about twenty years, and has produced some two-and-a-half million tons of ore; but the formation is more irregular than in any other mine in Furness, not even excepting Whitriggs. No rule governs it, except the general one, that the ore runs N.W. and S.E. Yet so many branches lie in a direction opposite to the ordinary apparent vein, that the general

[*Probably Carboniferous Limestone, locally converted into dolomite, as it often is where it has been affected by magnesian matter percolating downward from the New Red that formerly covered all that part of the country. ED.]

rule affords but little guidance in working the mine. Trials by means of drifts are frequently disappointing. Occasionally some enlargement inside the drift will lead to workings being carried on in a direction which brings them to some old drift that has been abandoned, and would, if carried a few feet further, have discovered a valuable bed of ore.

It should be remarked that as the mine is worked towards the south, the superincumbent mass of Yoredale shale increases, and the limestone dips at the same rate. The ore from one end to the other of this mine, apparently maintains the same relative depth in the limestone, and it is only the increasing thickness of the shale that causes the ore to be worked at an increasing depth.

The progress and development of the iron ore district of Low Furness is interesting and instructive. Up to the year 1840 the production of iron ore in the whole district did not exceed 30,000 tons, and this was raised in the most primitive manner by a machine called a horse-gin. The miners were raised and lowered in buckets. There were no pumps in the whole district, and, in fact, water being reached, put a stop to further operations.

In the years 1840 and 1841 an effort was made to get a tramway from the mines to the port of Barrow. The miners appealed to the Duke of Buccleuch, who was then the only mineral owner whose mines were in operation. This assistance was refused, and the origin of the Furness Railway Company was due to pure chance. In consequence of a scheme having been propounded to connect Preston with Carlisle by a railway across Morecambe Bay and Duddon Sands, prior to the formation of the Lancaster and Carlisle Railway, the Duke of Buccleuch, the Duke of Devonshire (then Earl of Burlington), and the Earl of Lonsdale, employed the celebrated engineer, Mr. James Walker, to survey the district, with the object of ascertaining—first, the advantages or disadvantages that might accrue to their respective properties in consequence of the formation of such railway; and, secondly, to ascertain whether in their joint interests any enclosure of the Duddon Sands could be made with advantage. It so happened that the writer of this paper was a personal friend of Mr. James Walker, and talked to

him on the subject generally, and especially drew his attention to the advisability of the formation of a railway from the mines to Barrow. With his usual foresight, Mr. Walker entertained the proposal favourably, and instructed his surveyors to ascertain the advantages such a railway would confer both on the district and on the mineral owners. The result was the formation of the Furness Railway Company, with the Duke of Devonshire at its head, who has remained the Chairman up to the present time. This railway only extended, in the first instance, from Barrow five miles up the country; but it reduced the distance the ore had to be carried from seven to two miles. This railway, while in progress of formation, was supplemented by another, which, branching off near Furness Abbey, was carried out along the coast up to the Duke of Devonshire's slate quarries, and is now a portion of the main line into Cumberland. This railway passes the mines of Park and Roanhead, which were at that time undiscovered. The railway was completed and opened in 1847, and Sir James Ramsden was appointed the resident manager, and by his energy and talent the Furness Railway Company has been brought into its present condition. The effect of this railway was to give an enormous impetus to the development of the mines, and led to the extension being made to Ulverston, and subsequently to Carnforth. The progress of mining industry was great, and the amount of ore, which in 1841 amounted to less than 30,000 tons, was increased in 1851 to 300,000 tons; in 1861, to 670,000 tons; and in 1871, to over 1,000,000 tons; and ore has continued to be produced at an average rate of from one to one-and-a-quarter million tons per annum up to the present time.

The opening of the Ulverston and Carnforth Railway for the first time rendered it possible for ore to be smelted in the district, and in 1859, the writer of this paper, with his partner, Mr. Hanney, commenced building furnaces in Barrow, and this, it may fairly be said, was the foundation of the present prosperity and development of the entire district.

In 1860 the production of pig-iron was only a trifle, in 1861 it reached 60,000 tons, and it has gained up to the present time

annually. The Barrow works are now producing over 300,000 tons ; the North Lonsdale Smelting Company, at Ulverston, about 80,000 tons ; the Askham Furnaces, from 60,000 to 80,000 tons ; and Carnforth Furnaces, from 80,000 to 100,000 tons : making the total production of the district at the present time somewhat over 550,000 tons.

The great drawback to the Furness District is, that it is entirely without coal ; and the problem to be solved was, whether it was cheaper to take ore to coal, or to bring coke, made out of coal, to the ore. The result has proved that it is cheaper to bring the coke to ore, and hence the successful erection of iron works in the Furness District.

As soon as the railway was in progress, it became evident that more scientific means of raising the ore must be used. Engines were erected, shafts were sunk deeper, and the water pumped in large quantities. And here we may observe that the difference in the quantity of water in various districts is very great. The Lindale Moor mines have comparatively little water ; but to the south end of Whitriggs, passing into the royalty worked by the Lindale Cote Company, the quantity is comparatively large, rising up to 1200 gallons per minute. At Mousell the quantity of water is very small, and engines of a very small power only are necessary to keep the mine clear. At Park, also, the quantity of water is small, and during the bulk of the year does not exceed two hundred and fifty gallons per minute, and the largest quantity of water ever known has not exceeded five hundred gallons per minute ; while at the extreme south end of the district, in the Stank mines and the adjoining royalty of Yarlside, the quantity of water amounts to 4,000 gallons per minute, and after a wet season has exceeded 5,000 gallons per minute.

The future of these Low Furness mines is problematic. Fresh discoveries are occasionally made, and ore is continually being found laterally ; and hitherto, except in a few cases, the mines have increased in depth, and ore still is found. But it seems pretty evident that in all cases, after a certain depth, which is at present unknown, but which probably will not exceed one hundred

fathoms below the top surface of limestone, the ore will be, so far as present knowledge goes, entirely worked out. It is not only impossible to say, but it is extremely improbable that the whole of the district has yet been explored, and at any moment a discovery equal to the Park and Roanhead conjoined mines may be made.

To shew the immense mass of wealth that lies within a very small space, it may be said that from under the surface of one acre at the Park mines one and a quarter million tons have been produced, and upon this minute area of surface a royalty of £80,000 has been paid to the mineral landlord, equal to a surface value of £16 per square yard.

Such is a short outline of the history of the rise and progress of the Hæmatite Iron Industry of Low Furness. And it is hoped that whilst it may prove interesting to those who visited the district yesterday, it may stimulate some of the members of the Association to a personal investigation of the geological problems to which reference has been made.

ON THE BEST LOCALITY FOR COAL
BENEATH THE PERMIAN ROCKS OF NORTH WEST
CUMBERLAND.

By J. D. KENDALL, C.E., F.G.S.

(*Read at the Bowness Annual Meeting.*)

IN the latest number (IX.) of the *Transactions*, there is a communication by Mr. T. V. Holmes, bearing the above title, in which appear several criticisms of a paper of mine on "The Structure of the Cumberland Coalfield," which was read about two years ago before the North of England Institute of Mining and Mechanical Engineers. Mr. Holmes' criticisms are directed against that part of the paper which deals with the formation known as the Whitehaven Sandstone. That formation, as you may know, is unconformable to the main body of the Coal Measures. It was first studied in the neighbourhood of Whitehaven, where most, if not all, its visible outcrops are mainly of a sandy nature, whence its name—Whitehaven Sandstone.

In my study of the Coalfield generally, I arrived at the conclusion that the formation in its north-easterly extension becomes somewhat modified, but that by taking the purple-grey colour which characterises it near Whitehaven as a guide, we are able to mark out its extent with considerable accuracy, although other considerations are necessary to determine its downward limit exactly, as pointed out by me in Vol. 33, Part IV., of the "Transactions of the North of England Institute of Mining and Mechanical Engineers."

Mr. Holmes says that "mere tint itself, without specific evidence

of unconformity in each case, can give no presumption of any weight as regards affinity or age." With that I agree entirely, and would point out to Mr. Holmes that he has altogether misunderstood me, for I hold that the purple-grey colour *accompanies an unconformity* (in the district under consideration), and do not assume, as he supposes, that there is an unconformity because some of the uppermost rocks of the Coal Measures differ in colour from the main mass below. In support of my view some evidence has already been given, but as it may generally be considered insufficient—as it clearly is to Mr. Holmes—I will herein adduce more. If colour alone had weighed with me, as Mr. Holmes supposes, I should have included in the Whitehaven Sandstone series (had my paper dealt with a larger area,) such rocks as the sandstone at Fort Putnam, near Blencow Station, which has exactly the colour of the Whitehaven Sandstone; but, as I have elsewhere shewn, the Fort Putnam rock is down among the Yoredales, so that clearly colour alone is not to be relied upon in determining the relative age of rocks. Other illustrations of the inadvisability of relying, in scientific investigations, upon one set of characters, will readily occur to most working naturalists. And here I would allude to Mr. Holmes' correlation, in the same paper, of the coal seams at Bullgill and Aspatria. In tracing out the identity of the seams at those two places, he apparently relies entirely upon the *distance* which the seams are apart; in other words, *because* at Bullgill there are two well known seams, and at Aspatria there are also two seams about the same distance apart, and the lower of which is known to correspond with the lower seam at Bullgill, Mr. Holmes concludes that the upper seam at both places is identical. This appears to me—to borrow an illustration from Botany—like employing the limited System of Linnæus for the purpose of determining the systematic position of a particular plant, instead of having recourse to the much more reliable Natural System. As Mr. Holmes must very well know, from his experience as a stratigraphist, there are many other circumstances of which it is necessary to take note in the correlation of coal seams besides their distance apart, such for example as their sections, thicknesses,

and qualities, and the mineral character of their associated rocks, as also the important consideration whether these are expanding or contracting. Looked at in this more general way, Mr. Holmes will find his correlation untenable. There is one *obvious* error in it, even supposing his mode of procedure be admitted. The dark shale band in Aspatria No. 3 Pit which he correlates with the Rattler band of Bullgill, is, if it corresponds with any seam in the Lower Measures, rather the correlative of the Slaty band of that place—a seam which there occurs below the Rattler band. This is best seen by passing from the section at Bullgill to that at Brayton Domain first, and then on to Aspatria. With this important amendment Mr. Holmes' Ten Quarters seam at Aspatria becomes the Rattler band, so that he would have to take the next seam higher for his Ten Quarters, and that is a seam which is still more unlike the real Ten Quarters than the one he has already fixed upon. Moreover, the general section at Aspatria, from this new Ten Quarters down to the thirty inch coal, is so unlike that at Bullgill, as to make it most improbable that they are equivalent parts of the Coalfield; so much so in fact that unless some evidence of the transition from one section to the other could be produced from an intermediate position, I should, irrespective of other considerations, most unhesitatingly reject such a supposition.

But to return to the Whitehaven Sandstone series. The remarks of Mr. Holmes relative to the occurrence of purple-grey rocks outside the area embraced in my paper are altogether beside the question. The conclusions drawn by me from the study of a *particular* district are not intended to have a *general* application, and therefore I must decline to follow Mr. Holmes when he proceeds to test my conclusions in any such way, especially when he employs for that purpose negative evidence only.

If the purple-grey colour of the rocks in the neighbourhood of Aspatria and Mealsgate, etc., which I include in the Whitehaven Sandstone series is due to Permian staining, as held by Mr. Holmes, I suppose it will be generally admitted that the Whitehaven Sandstone proper, that is, the rock of that name which occurs in the neighbourhood of Whitehaven, was tinted in the

same way. Now, as the rocks throughout the Cumberland Coalfield are of the same argillaceous and arenaceous nature it might be expected that the Permian staining would originally extend everywhere to about the same depth, that is to say, *its lower limit would be parallel to the base of the overlying Permians*. These latter rocks, as is known, are unconformable to the Coal Measures, and therefore the staining would cut across the bed planes of those rocks in such a way as to suggest that the tinted strata were unconformable to those below them. It is thus clear that if the unconformity of the Permians were sufficiently great we should have a tinted band of Coal Measures which would include the "rise" part of every seam in the field.

The unconformity actually occurring in the district under consideration is of this extent, but the inferences which have just been drawn, and which I hold to be legitimate deductions from the premises, are not paralleled by the facts, and therefore I doubt the validity of those premises; in other words, I dispute that the purple-grey rocks are stained Lower Coal Measures. For in the first place we find that at Croft Pit, near Whitehaven, they extend only to a depth of one hundred and seventy-five feet from the base of the Permians, whereas at Mealsgate, where the Permians have been removed, the purple-grey rocks occur more or less throughout a depth of five hundred and fifty-two feet. Then again there is not a single place throughout the whole Coalfield, so far as I know, where purple-grey rocks occur *below* any *well known* seam in Lower Coal Measures,* which there certainly should have been if the purple-grey rocks which I include in the Whitehaven Sandstone series are simply Lower Coal Measures that have been stained, as supposed by Mr. Holmes. Not one of the many seams worked in the Cumberland Coalfield has ever been worked or traced from the purple-grey rocks into the darker rocks of the Lower Coal Measures, or *vice versa*. This fact to my mind is perfectly conclusive against Mr. Holmes' argument. Again, if the purple-grey rocks were simply stained Lower Coal Measures, their

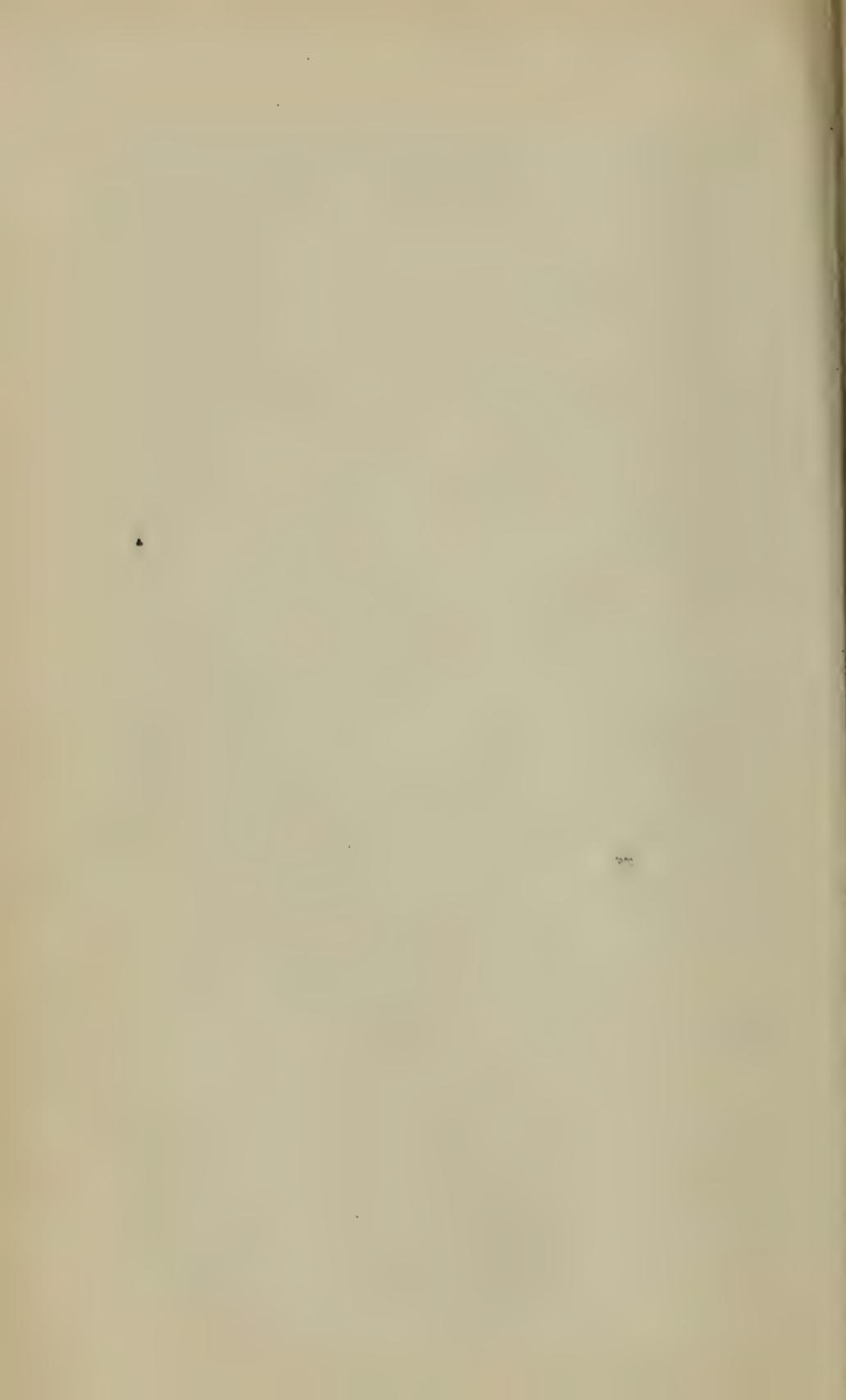
* This expression is used here and throughout this paper in the same sense as in "The Structure of the Cumberland Coalfield."

lower edge would cut obliquely across the bedding when seen in vertical section, whereas the base of the purple-grey rocks is parallel to the bedding, as shewn by me in Vol. 33, Part 4, of the "Transactions of the North of England Institute of Mining and Mechanical Engineers."

If we look upon the purple-grey rocks as part of another series resting unconformably upon the Lower Coal Measures, as shewn by me first in Vol. 32, and again in Vol. 33 of the above-named Transactions, one of the greatest difficulties we meet with in our attempts at correlation is removed, and we can then understand—and we cannot otherwise—why seams that have been worked over extensive areas should disappear all at once in the midst of coal strata, and without any dislocation of that strata, or without any previous thinning of the seam. On my explanation this is brought about simply: the seams in the Lower Measures being cut off by the overlying Whitehaven Sandstone series in a manner similar to that which is known to occur in the Coalfield of Coalbrookdale.

Under other circumstances I should have liked to reply to each of Mr. Holmes' objections in the order in which they occur, but want of space compels me to deal with his observations generally.

Before concluding I would draw attention to what must be an oversight in Mr. Holmes' paper. In his two diagrams of the Coalfield he shews the Permians as if lying at a greater angle than the Coal Measures. So far as my experience goes, the reverse is the fact, so that the further we go to the dip the greater is the number of seams we are likely to meet with in the Coal Measures. I mention this simply because it has an important bearing on the question under discussion by Mr. Holmes, and not by way of reply to any of his criticisms.



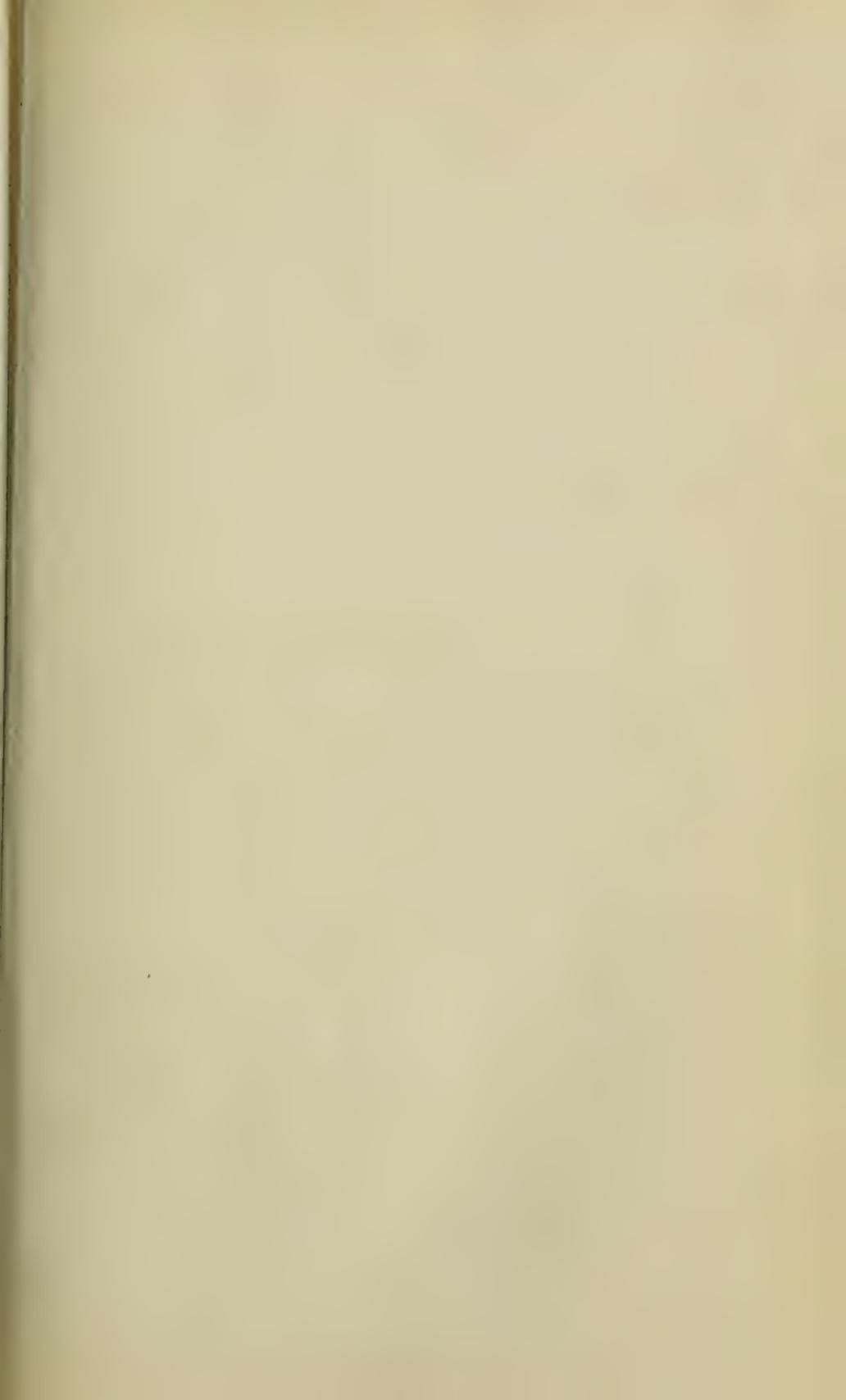
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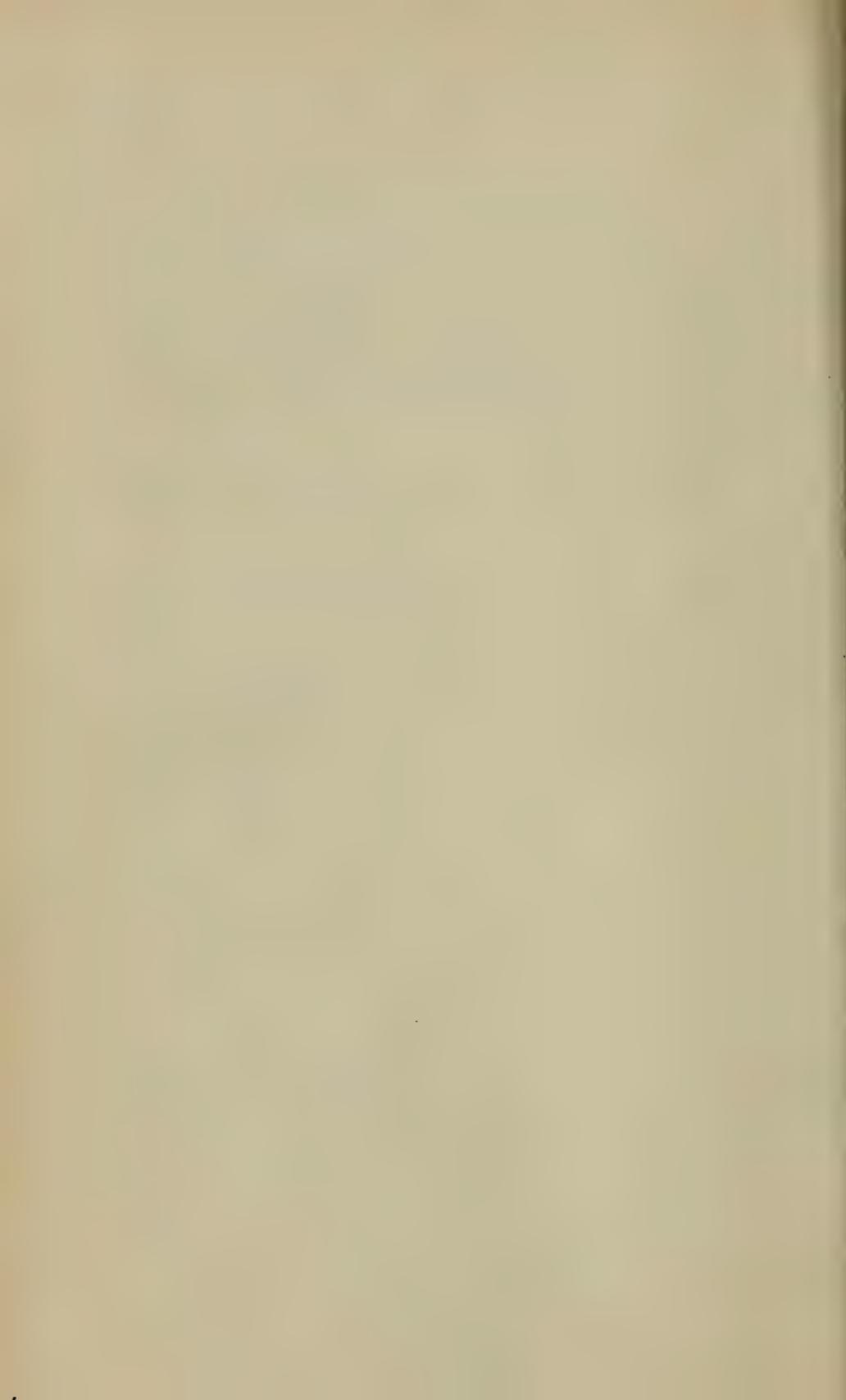
NOTE.—*The entries in this index comprise only the authors and titles of complete papers, save in some few cases where an asterisk denotes a sub-title in a longer paper.*

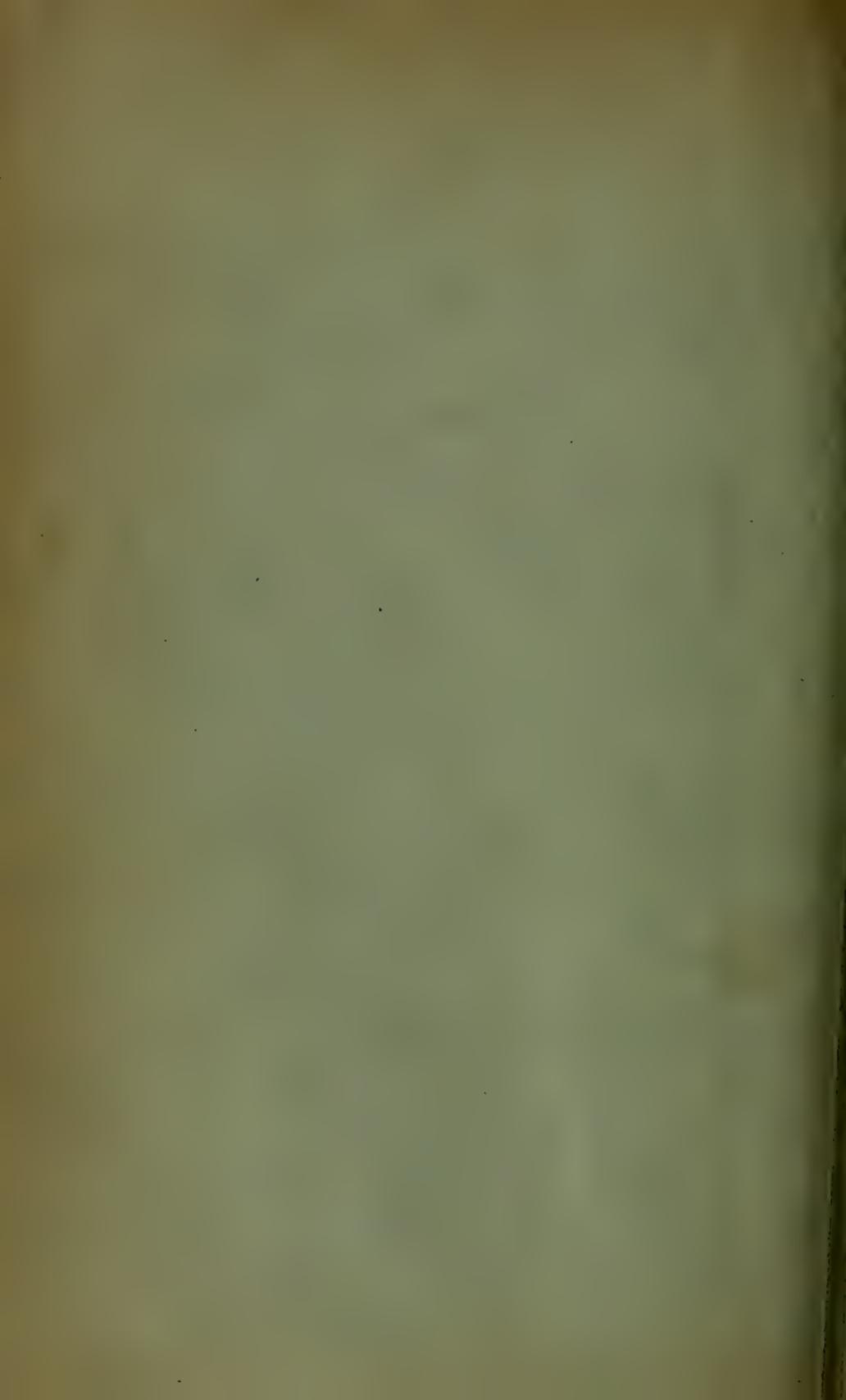
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Cumberland and Westmorland Association

FOR THE

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AND SCIENCE,*

No. XI.—1885-86.

EDITED BY J. G. GOODCHILD, F.G.S., F.Z.S.,

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION;
R. M. GEOL. SURVEY.

PRICE TO MEMBERS, ONE SHILLING.

NON-MEMBERS, TWO SHILLINGS AND SIXPENCE.



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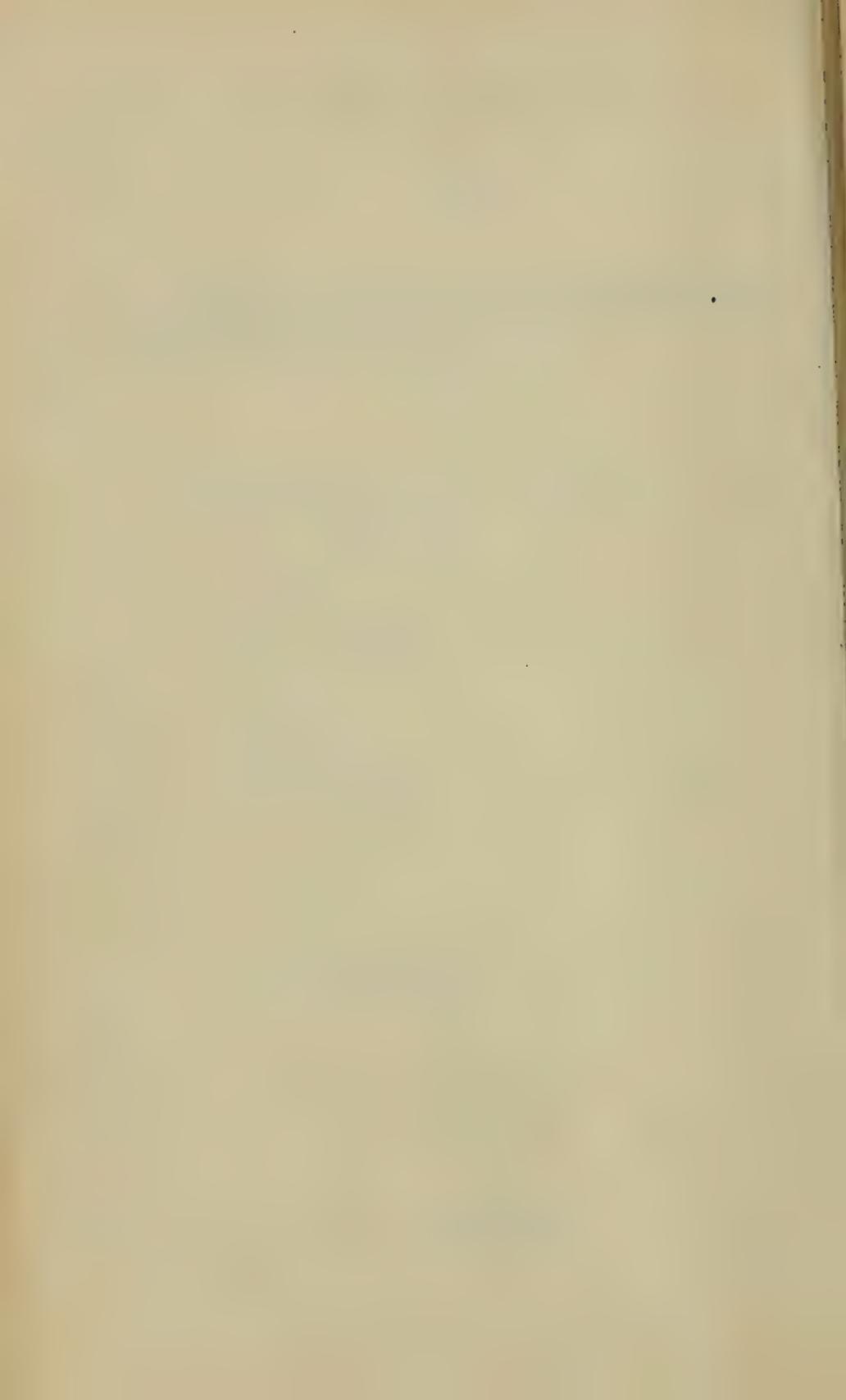
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NOTE.

Spare Copies of Nos. 1, 3, and 4 of the TRANSACTIONS will be gladly received by the Secretary (Mr. Crowder, Stanwix, Carlisle), and One Shilling will be allowed for each copy.

CUMBERLAND AND WESTMORLAND ASSOCIATION
FOR THE
ADVANCEMENT OF LITERATURE AND SCIENCE.

Proceedings at the Annual Meeting at Keswick, 1886.

THE ELEVENTH ANNUAL MEETING of the Association was held this year at Keswick, on *Tuesday and Wednesday, May 25th and 26th.*

The Proceedings opened, as usual, with the Address by the PRESIDENT, (David Ainsworth, Esq.,) whose subject was—"London Past and Present." The history of our great metropolis was sketched through the Roman, Saxon, Norman, Tudor, and Stuart periods, to our own days; the remaining part of the able and interesting address being devoted to a consideration of the condition of the masses in the East-end, and of the means that had been, and might be, adopted for its amelioration. On the motion of the Chairman, the Rev. J. N. Hoare, President of the Keswick Society, seconded by the Rev. E. W. Chapman, a hearty vote of thanks was accorded the President. The Members, to the number of about sixty, then sat down to an excellent Lunch, provided by Mr. W. Wilson, of the Keswick Hotel, to whose efforts for their comfort and convenience during the Meeting, the Members of the Association are much indebted. Before rising, the Rev. J. N. Hoare said a few words, welcoming the Members to Keswick.

The party then divided into two portions. One chose the Excursion on Derwentwater, by boat to Lord's Island, the party being received by the proprietor, Mr. R. D. Marshall. Here a paper was read by Mr. J. F. Crosthwaite, F.S.A., on the residence built on the Island about 1450, by Sir T. Radcliffe, from whom descended the Earls of Derwentwater. Remains of the mansion still exist, over which the party was conducted. S. Herbert's Isle was then visited. Here a paper on the Saint whose name it bears—the friend and contemporary of S. Cuthbert—was read by the Rev. H. D. Rawnsley. The party then went to Portinscale, where, through the kindness of Mrs. Leitch, they partook of tea, afterwards proceeding to Crosthwaite Church. The many interesting features of this edifice were pointed out by the Vicar and Mr. Crosthwaite. Mr. Wivell's Pencil Works at Greta Bridge were then inspected, and the process of manufacturing pencils described. The Excursion concluded with a visit to Greta Hall, for many years the residence of Southey. By the kind permission of Miss Brindle, the present occupant, every facility was afforded the party of inspecting the Hall.

The remainder of the Members went with the alternative Excursion, by coach, to S. John's Vale and Thirlmere, visiting *en route* the Druids' Circle. Features of geological interest were pointed out by Mr. Postlethwaite, F.G.S., especially the junction of the Skiddaw slate with the granite. Castle Rock, associated with Sir Walter Scott's *Bridal of Triermain*, was then passed, and Thirlmere soon afterwards reached. At Armboth the party divided,

one section proceeding on foot to visit the Armboth Dyke and the old British Camp behind Raven Crag, joining the rest of the party at Shoulthwaite, whence they returned to Keswick. The inclement weather of the morning, which had doubtless prevented many Members from visiting Keswick, fortunately changed during the afternoon for the better, and the excursions proved very enjoyable.

In the evening the usual Council Meeting was held, and was attended by a fair number of Delegates from the various affiliated Societies. Between seven and eight, a *Conversazione* was held in the Museum at the Town Hall, and a paper was read by the Rev. H. D. Rawnsley, on "The Epitaphs of Wordsworth," especially referring to that on Southey in Crosthwaite Church. Soon afterwards the company adjourned to the Battersby Lecture Hall in the Library, where a Lecture on "The Tombs of the Early Martyrs" was delivered by Professor Baldwin Brown, of Edinburgh. At its close, a hearty vote of thanks was, on the motion of the President, accorded to the Lecturer.

The proceedings of the second day commenced with a Council Meeting, adjourned from the previous evening, which was succeeded by the Annual General Meeting of the Association. The Annual Report and Balance Sheet were read by the Hon. Secretary, which will be found on pp. xxv.—xxvii. The improved financial condition of the Association, showing a small balance in hand, was considered very satisfactory.

The Reports of the Societies having been taken as read, it was moved and carried that the Report and Balance Sheet be adopted.

Major Arnison moved, and Mr. Thompson (Windermere) seconded the motion, that Mr. Ainsworth be re-elected President for the ensuing year, which was carried unanimously. The President having acknowledged the compliment paid him by the Association in his re-election, on the motion of the Rev. J. N. Hoare, seconded by Mr. G. Watson, Mr. Goodchild was re-appointed Editor; Mr. R. Crowder, Secretary and Treasurer; and Mr. Duckworth, co-Recorder in Zoology along with the Rev. H. A. Macpherson.

On behalf of the Maryport Literary and Scientific Society, Mr. D. Irving then invited the Members to hold their next Annual Meeting in that town. This, on the motion of Dr. Knight, was agreed to.

A hearty vote of thanks was then passed to the President, Secretary, and Committee of the Keswick Society, for the efforts they had made to render the Meeting a success. Thanks were also voted to Professor Brown; to the writers of papers; to those who had so generously entertained, or opened their grounds to, Members during the Meeting; and finally, to the President, for his services during the past year.

Shortly afterwards the party left by coach for Buttermere, going by the west side of Derwentwater, through Borrowdale and Honister Pass. At Hollas, most of the party, led by Mr. Goodchild and Mr. Postlethwaite, went to visit the junction of the volcanic rocks of Borrowdale with the Skiddaw slate, the former gentleman reading an interesting paper on the subject, while Mr. Postlethwaite made a few remarks on the Salt Springs at Brandley Mine and Saltwell Park. Rejoining the carriages, the party soon reached Buttermere, where an excellent luncheon was provided at the Victoria and Fish Hotels. A paper was afterwards read by Mr. Postlethwaite on the Honister Slate Quarries, and on the habits and qualities of the workmen engaged in them. A pleasant hour having been spent on the shores of Crummock Water, the party returned to Keswick by the vale of Newlands. The brilliantly fine weather, and clear atmosphere, made this Excursion exceptionally enjoyable, and it appropriately concluded the proceedings of the Meeting of 1886.

R U L E S
OF THE
Cumberland and Westmorland Association
FOR THE
Advancement of Literature and Science.

1.—That the Association be called the “CUMBERLAND AND WESTMORLAND ASSOCIATION FOR THE ADVANCEMENT OF LITERATURE AND SCIENCE.”

2.—The Association shall consist of the following Societies :—
Keswick Literary and Scientific Society, Maryport Literary and Scientific Society, Longtown Literary and Scientific Society, Carlisle Scientific Society and Field Naturalists' Club, Ambleside and District Literary and Scientific Society, Silloth and Holme Cultram Literary and Scientific Society, Brampton Literary and Scientific Society and Field Naturalists' Club, Penrith and District Literary and Scientific Society, Windermere Literary and Scientific Society; and of such other Societies as shall be duly affiliated. Also of persons nominated by two members of the Council; this latter class of members shall pay the sum of 5s. annually.

3.—All members of affiliated Societies, unless otherwise ruled by the regulations of their respective Societies, shall be members of the Cumberland and Westmorland Association.

4.—The Association shall be governed by a Council, consisting of a President, Vice-Presidents, Secretary, who shall also be Treasurer, an Editor, and of ordinary members, two to be elected by each affiliated Society. The President, Secretary, and Editor shall be elected annually at the Annual Meeting, and shall be capable of re-election.

5.—The Vice-Presidents shall consist of the Presidents of the various affiliated Societies; and the delegates of the various Societies shall be elected annually by their respective Societies.

6.—An Annual Meeting of the Association shall be held at such time and place as may be decided upon at the previous Annual Meeting, or (failing such appointment) as may be arranged by the Council.

7.—At each Annual Meeting, after the delivery of the President's Address, and the reading of the Reports from the affiliated Societies, the objects of the Association may be furthered by Lectures, Papers, Addresses, Discussions, Conversaciones, &c.

8.—The Committee of each affiliated Society shall be entitled to recommend one original and local paper communicated to such Society (subject to the consent of the author) for publication in the *Transactions* of the Association; but Societies contributing capitation grant on a number of members exceeding one hundred and fifty shall have the privilege of sending two papers. The Council shall publish at the expense of the Association the papers recommended, either in full, or such an abstract of each or any of them as the author may prepare or sanction; also those portions of the Association Transactions that may be deemed advisable.

9.—The Council shall endeavour to promote co-operation among

existing Societies, and may assist in the formation of new ones ; it may also aid in the establishment of classes in connection with any of the associated societies.

10.—Affiliated Societies shall contribute annually towards the general funds of the Association, Sixpence for each of their members ; but when the number of members of the affiliated Societies exceeds one hundred and fifty, a reduction of fifty per cent. shall be made upon the payment for each member in excess of that number.

11.—The rules can be altered only by a majority of two-thirds of the members present at an Annual Meeting. Any member desiring to alter the Rules must send a copy of the proposed alterations to the Secretary, at least two weeks before the meeting is held.

12.—Past Presidents of the Association shall be permanent members of the Council, and be described as Past-Presidents.

13.—The travelling expenses of all who assist in carrying out the programme of the various affiliated Societies shall be defrayed by the Society assisted.

The Twelfth ANNUAL MEETING will be held in the Summer of 1887, and due notice of the place of Meeting and of the arrangements will be sent to all members of the Association.

Members willing to contribute original *Articles* on subjects of local interest, or short *Notices* of anything that may be considered worth recording of local and scientific value, should communicate with the Honorary Secretary, ROBERT CROWDER, Esq., Stanwix, Carlisle.

OFFICERS FOR THE SESSION 1886-87.

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Rev. S. FALLE, M.A.,	}	Brampton.
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Major W. B. ARNISON,	}	Penrith.
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T. THOMPSON,		

Hon. Association Secretary and Treasurer.

ROBERT CROWDER, M.A., Stanwix, Carlisle.

Editor.

J. G. GOODCHILD, F.G.S., F.Z.S., H.M. Geol. Survey, 28 Jermyn-St., London

Zoological Recorders.

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London, W.

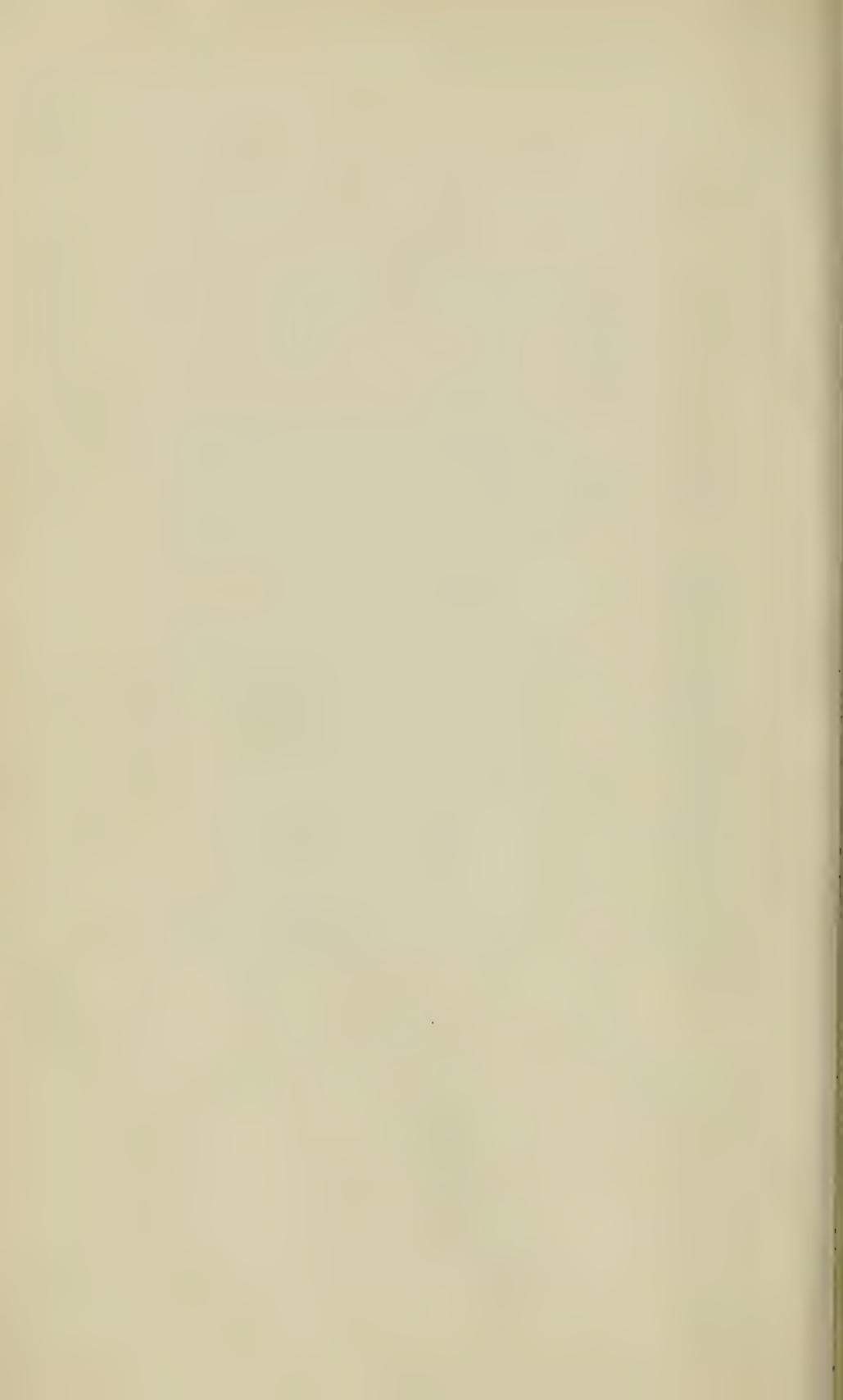
W. DUCKWORTH, Carlisle.

Botanical Recorders.

Rev. R. WOOD, M.A., Rosley Vicarage, Carlisle.
W. HODGSON, A.L.S., Flimby, Maryport.

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Longtown	WILLIAM JARDINE, The United School.
Carlisle	JOHN SINCLAIR, 6 Hawick Street.
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Silloth	JAMES B. BINKS.
Brampton	C. J. RIGG.
Penrith	H. M'LEAN WILSON, M.B., C.M.
Windermere		}	Col. W. C. MACDOUGALL. F. BARTON, 8 Biskey Howe Terrace, Bowness.



Reports from the Associated Societies.

WHITEHAVEN SCIENTIFIC ASSOCIATION,

HOWGILL STREET.

19TH SESSION, 1885-86.

President J. VIVIAN, C.E.

Vice-Presidents.

W. MC.GOWAN. | W. I'ANSON, M.B.

Past-Presidents.

T. F. I'ANSON, M.D., F.R.H.S.	|	H. A. FLETCHER, F.R.A.S.
W. JACKSON, J.P., F.S.A.	|	JAMES BAIRD.
AUGUSTUS HELDER.	|	R. RUSSELL, C.E., F.G.S.
W. H. KITCHIN.	|	A. KITCHIN, F.C.S.

J. G. DEES, C.E.

Committee.

E. ABLETT, M.D.	|	T. JACKSON, M.D.
B. TAYLOR.	|	JOHN NIXON, B.A.
T. GORDON.	|	E. CROMPTON, C.E.

G. SCOLAR, C.E.

<i>Curator of Museum</i>...	...	...	...	W. I'ANSON, M.B.
<i>Curator of Building</i>...	...	...	...	R. PICKERING, C.E.
<i>Treasurer</i> ...	...	...	...	J. S. HELLON.
<i>Hon. Librarian</i> ...	...	...	...	R. B. GORDON.

Hon. Secretaries.

W, H. KITCHIN. | E. DOBSON,

The following *MEETINGS* were held during the Session:—

- Oct. 20.—CONVERSAZIONE. THE PRESIDENT'S ADDRESS.
 Nov. 10.—Rev. W. LYTTEL, (Longtown.)—"Border Clans: a narrative of the Heroic Age."
 Nov. 24.—Rev. E. P. KNUBLEY, M.A., (Rector of Staveley.)—"A Visit to Canada."
 Dec. 8.—J. D. KENDALL, F.G.S.—"Formation of the English Lakes."
 Dec. 22.—W. MC.GOWAN and R. RUSSELL—"An Hour with the Scottish Minstrels."
 Jan. 12.—E. T. TYSON—"Captain Joseph Huddart, F.R.S."
 Jan. 26.—D. BURNS, C.E., (Carlisle.)—"Notes on the Copper Ores in the Southern Urals."
 Feb. 9.— $\left\{ \begin{array}{l} \text{J. BAIRD.—"Recent Improvements in the Manufacture of} \\ \text{Iron and Steel."} \\ \text{J. VIVIAN, C.E.—"Salt and Salt-mining."} \end{array} \right.$
 Feb. 23.—H. WOOLCOCK, M.E.—"Manitoba, the North-west Territories, and the United States, as seen in 1884."
 Mar. 9.—G. H. PARKE, F.G.S., F.Z.S.—"Some Lower Forms of Animal Life."
 Mar. 23.—Rev. J. MACARTHUR, M.A., (Rector of Lamplugh.)—"Studies in Sociology."
 Apl. 6.—Rev. A. SUTTON, M.A., (Rector of Bridekirk.)—"Experiences in Abyssinia."
 Apl. 20.—Business Meeting, Election of Officers, &c.

KESWICK LITERARY AND SCIENTIFIC SOCIETY.

17TH SESSION, 1885-86.

President Rev. J. N. HOARE, M.A., F.HIST.S.

Vice-Presidents.

Rev. W. COLVILLE. | J. R. ANDERSON, B.A.

Secretary T. E. HIGHTON.

Treasurer EDWIN JACKSON.

Committee.

REV. H. D. RAWNSLEY, M.A.
 GEORGE BLACK, M.B.
 J. FISHER CROSTHWAITE, F.S.A.

J. POSTLETHWAITE, F.G.S.
 WILLIAM WOOD.
 G. H. DIXON, B.A.

Hon. Curators of the Museum.

A. A. H. KNIGHT, M.D.

JOHN BIRKETT.

The following MEETINGS were held during the Session :—

ORDINARY MEETINGS.

1885.

Oct. 26.—PRESIDENT'S ADDRESS.

Nov. 16.—MR. J. POSTLETHWAITE, F.G.S.—“The Trilobites of the Skiddaw Slates.”

Nov. 30.—REV. H. LONSDALE, M.A.—“Frank Buckland, the Naturalist.”

Dec. 14.—REV. H. WHITEHEAD, M.A.—“Crosthwaite Churchwardens' Accounts.”

1886.

Feb. 8.—REV. A. R. GODDARD, B.A.—“Lives and Adventures of Germanicus and Agrippina.”

Feb. 22.—MR. W. WILSON.—“Old-fashioned Inns.”

Mar. 8.—DR. T. H. BROWN.—“Mrs. Browning and her Works.”

Mar. 22.—REV. H. D. RAWNSLEY, M.A.—“Footpaths.”
 General Meeting.

LECTURES.

1885.

Nov. 3.—F. W. H. MYERS, Esq.—“Nelson.”

Nov. 23.—W. R. FITZPATRICK, Esq.—“Molière and his Times.”

Dec. 7.—REV. J. SHARPE OSTLE, M.A.—“Notes on the Cumbrian Dialect.”

Dec. 23.—PROFESSOR KNIGHT, LL.D.—“Shakespeare, as Dramatist and Moral Teacher.”

1886.

Feb. 15.—REV. W. S. CALVERLEY.—“The Gosforth Cross.”

Mar. 1.—REV. C. H. GEM, M.A.—“Tennyson.”

Mar. 15.—REV. A. SUTTON.—“A Journey from Cairo to Khartoum.”

Mar. 29.—J. G. GOODCHILD, Esq., F.G.S.—“Fowling.”

MARYPORT LITERARY AND SCIENTIFIC SOCIETY,

ASSEMBLY HALL, HIGH STREET.

10TH SESSION, 1885-86.

President J. B. BAILEY.
Vice-President Rev. W. P. SCHAFFTER.

Past-Presidents.

J. HEWETSON. | J. CARTMELL, A.M.I.C.E. | W. HINE.

Committee.

Rev. J. S. CRAIG.	|	A. HINE.
Dr. W. B. MATHIAS	|	F. WALKER.
J. ROSS.	|	J. WILLIAMSON.
P. B. MELMORE.	|	R. H. HAMILTON.
G. M. TICKLE.	|	C. EAGLESFIELD.

Delegates.

Dr. MATHIAS. | J. CARTMELL.

Treasurer Q. MOORE.
Hon. Secretary D. IRVING.

The following *MEETINGS* were held during the Session:—

1885.

Oct. 27.—CONVERSAZIONE.

Nov. 10.—W. HODGSON, A.L.S.—“Seaside Botany—St. Bees to Bowness.”

Nov. 26.—R. RUSSELL, C.E., F.G.S.—“What is Limestone?”

Dec. 8.—THOS. BLAIN.—“Charles Dickens.”

Dec. 22.—J. B. BAILEY, (*President*.)—“Shakespeare,”—a Suggestive Sketch.

1886.

Jan. 5.—G. H. BAILEY, D.Sc., Ph.D.—“The Spectroscope and its uses.”

Jan. 19.—J. NEWBY HETHERINGTON, F.R.G.S.—“Chaucer, the First English Humourist.”

Feb. 2.—H. A. LEDIARD, M.D., F.R.G.S.—“Cremation.”

Feb. 16.—WILFRED HINE.—“The Congo.”

Mar. 2.—C. S. HALL, M.R.C.S. ENGD., (*President of the Carlisle Microscopic Society*.)—“An Evening with the Microscope.”

Mar. 16.—WELBY I'ANSON, M.B., C.M.—“Bacteria.”

Mar. 26.—J. G. GOODCHILD, F.G.S., &c.—“Coal.”

Apl. 6.—General Meeting and Election of Officers.

LONGTOWN LITERARY AND SCIENTIFIC SOCIETY,

9TH SESSION, 1885-86.

President Rev. J. R. GIBSON.

Vice-Presidents.

R. A. ALLISON, Esq., M.A., M.P.	|	S. F. MC.LACHLAN, Esq., M.B.
Rev. P. CARRUTHERS.		WM. EASTON ROBERTSON, Esq.

Treasurer and Secretary WM. JARDINE.

Committee.

I. RIGG.	|	Rev. WM. LYTTEIL.
WM. LITTLE.		A. TWEDDLE.
A. P. WILKIE.		WM. KILGOUR.

JOHN WILSON.

Sub-Committee.

Mrs. MC.LACHLAN.	|	Mrs. WANNOP.
Mrs. MORTON.		Miss A. RIGG.

Miss L. FARRIES.

The following MEETINGS were held during the Session:—

1885.

- Nov. 3.—Inaugural Tea Meeting. Rev. J. R. GIBSON, (*President.*)—
“The Human Mind: Speech.”
- Nov. 10.—Rev. GEO. LAMBERT.—“Trinidad—Historical and Descriptive.”
- Nov. 17.—Debate: “Should Education be Free?” *Affir.* A. P. WILKIE;
Neg. Rev. J. R. GIBSON.
- Nov. 24.—W. PEARSON, Esq., London, (*late Lecturer Palestine Exploration Fund.*)—“What the Bible has gained from the recent Discoveries in Palestine.”
- Dec. 1.—J. H. PARK, Esq.—“Credulity and Superstition—what the World has Suffered from them.”
- Dec. 8.—Miss MARY BASKIN.—Miscellaneous Poems from English and American Authors.
- Dec. 15.—Rev. J. PHELPS.—“Bee-keeping.”
- Dec. 22.—Debate: “Does the Newspaper Press fulfil its proper object?”
Affir. Dr. S. F. MC.LACHLAN; *Neg.* Mr. J. WILSON.
- Dec. 29.—Mr. J. WILSON.—“Social Forces.”

1886.

- Jan. 5.—Musical Evening, Readings, &c.
 Jan. 11.—Dr. MC. LACHLAN.—“English Literature.”
 Jan. 19.—Rev. J. WALLACE, M.A.—“The Voice of Nature and the Voice of God.”
 Jan. 26.—Mr. A. P. WILKIE.—“Yarrow and its Associations.”
 Feb. 2.—Debate: “Are the Present Times Better than the Past for Working Men?”
 Feb. 9.—Mr. J. CHALMERS, V.S.—“Influences of the Diseases of our Domestic Animals on Human Health.”
 Feb. 16.—W. EASTON ROBERTSON, Esq.—“Unwritten History.”
 Feb. 23.—Mr. W. JARDINE.—“Local Superstitions.”
 Mar. 2.—Dr. TAYLOR.—“Athletics in relation to Health.”
 Mar. 9.—Mr. R. G. BATY, M.R.A.C.—“Insect Depredators.”
 Mar. 16.—Mr. FRED. HARRISON.—“The Effects of Cultivation on Scenery.”
 Mar. 23.—Rev. C. J. SENIOR.—“Frances Ridley Havergal’s Life and Writings, illustrated by her Songs.”
 Apl. 1.—J. G. GOODCHILD, F.G.S., H.M. Geol. Survey.—Geological Lecture.
 Apl. 6.—Business of the Society, Election of Officers, &c.

CARLISLE SCIENTIFIC SOCIETY AND FIELD
 NATURALISTS’ CLUB.

9TH SESSION, 1885-86.

President Rev. C. H. PAREZ, M.A.

Past-Presidents.

The Right Rev. the LORD BISHOP OF CARLISLE.

ROBT. FERGUSON, Esq., M.P., F.S.A. | MILES MACINNES, Esq., M.P.
 R. S. EERGUSON, Esq., M.A., F.S.A.

Vice-Presidents.

S. J. BINNING, Esq. | Dr. CARLYLE.

Treasurer WM. NANSON, Esq., B.A., F.S.A.
Hon. Secretary JOHN SINCLAIR, 6 Hawick Street.

Committee.

R. J. BAILLIE.
 ISAAC CARTMELL.
 J. A. WHEATLEY.
 ROBT. CROWDER.
 DR. MACLAREN.
 DR. BARNES.

F. HARRISON.
 T. DUCKWORTH.
 W. DUCKWORTH.
 R. M. HILL.
 GEO. DAWSON.
 W. B. DODD.

The following MEETINGS were held during the Session :—

LECTURES.

1885.

Nov. 3.—Inaugural. Rev. C. H. PAREZ, M.A., (*President.*)—"History of Education."

Dec. 8.—Rev. H. D. RAWNSLEY, M.A.—"Recollections of a Personal Tour from Cairo to Sinai,"—illustrated with Magic Lantern.

1886.

Jan. 5.—J. HEPWORTH, Esq., A.M.I.C.E.—"The Standard of Light."

Feb. 2.—R. J. BAILLIE, Esq., F.S.Sc.—"The Earth's History from a Scientific point of View."

Mar. 2.—R. S. FERGUSON, Esq., M.A., F.S.A.—"The Siege of Carlisle, 1644-45."

Mar. 30.—J. G. GOODCHILD, Esq., F.G.S.—"Fowling."

ORDINARY MEETINGS.

1885.

Nov. 24.—Mr. WM. HODGSON, A.L.S.—"Botany of the Solway Beach—St. Bees to Bowness."

Dec. 22.—Mr. F. HARRISON.—"Some Old Cumberland Customs."

1886.

Jan. 19.—Mr. J. SINCLAIR.—"Insects mentioned in Shakespeare." Part 2.

Feb. 16.—Mr. T. DUCKWORTH.—"Our Woodlands."

Mar. 16.—Dr. CARLYLE.—"Leathery Fungi."

Apl. 13.—Dr. LEDIARD, F.R.C.S.—"Drains and Drain Fevers." Annual Meeting.

AMBLESIDE AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

9TH SESSION, 1885-86.

President Rev. E. M. REYNOLDS.

Past-Presidents.

R. CREWDSON, Esq. | Rev. H. S. CALLENDER.

Vice-Presidents.

F. M. T. JONES, Esq. | G. GATEY, Esq.

Treasurer W. LISTER.

Secretary J. BENTLEY.

Delegates.

C. W. SMITH. | J. BENTLEY.

Committee.

T. BELL.	|	W. E. PERCIVAL.
Rev. C. H. CHASE.	|	H. REDMAYNE, Esq.
J. FLEMING.	|	J. RUSSELL.
J. HIRD.	|	Mr. STALKER, Senr.
T. MACKERETH.	|	C. W. SMITH.

The following MEETINGS were held during the Session :—

1885.

Oct. 30—J. C. BUCKMASTER, B.A., F.S.A.—“Art in its relationship to Houses, Furniture, Dress,” &c.

Nov. 6—A. HAMILTON, Esq., M.D.—“History of Vaccination and its results.”

Nov. 20—A. STRAHAN, Esq., M.A., F.G.S.—“Our Lake Basius; their origin and contents.”

Dec. 4—W. G. COLLINGWOOD, Esq., M.A.—“Stories of the Stars.”

Dec. 18—Rev. G. E. P. READE, M.A.—“Lord Clive, and the Foundation of the British Empire in India.”

1886.

Jan. 29—F. BARTON, Esq.—“Beethoven and his Influence on Music.”

Feb. 12—Rev. H. HAYMAN, D.D.—“Russian Central Asia.”

Feb. 26—J. K. KENDALL, B.A.—“The Electrical Transmission of Power.”

Mch. 12—B. JUMEAUX, Esq., F.R. MET. SOC.—“The Comet of 1882, and its probable influence on the Earth.”

ANNUAL MEETING; Election of Officers.

Mch. 23—J. G. GOODCHILD, Esq., F.G.S.—“Westmorland Dialects.”

SILLOTH AND HOLME CULTRAM LITERARY
AND SCIENTIFIC SOCIETY.

7TH SESSION, 1885-86.

President H. L. BARKER.

Vice-Presidents.

JOHN LEITCH, M.B., C.M.

JOHN GRAHAM.

Committee.

Rev. J. BROWN, M.A.
G. T. CARR.
W. CRABB.
JOHN GLAISTER.

Rev. S. HEBERT, M.A.
W. M. HUDSON.
J. MADAGAN.
J. M. PAULL.

W. F. WILSON, J.P.

Hon. Treasurer J. STRONACH
Hon. Secretary J. B. BINKS

The following MEETINGS were held during the Session:—

1885.

- Oct. 9—THOMAS THOMPSON.—“Cumberland Past and Present.”
Oct. 23—P. GEDDES, F.R.S.E.—“Natural Science in its bearings on Life.”
Nov. 4—JOHN GLAISTER.—“An Introduction to our Lepidoptera.”
Nov. 18—DR. BLACK, Keswick.—“Sick Nursing.”
Nov. 25—Rev. S. HEBERT, M.A.—“Ten Days in Rome,” illustrated by
the Magic Lantern.
Dec. 11—Rev. JAMES CHRISTIE, B.A.—“Through Norway to the North
Cape.”

1886.

- Jan. 13—J. NEWBY HETHERINGTON, F.R.G.S.—“Chaucer, the first English
Humourist.”
Jan. 27—J. M. PAULL.—“Alpine Incident and Adventure.”
Feb. 10—Dr. WELBY P'ANSON, Whitehaven.—“Infection.”
Feb. 24—Rev. JOHN BROWN, M.A.—“Thomas de Quincey.”
Mch. 10—Dr. LEDIARD, Carlisle.—“Drains and Drain Fevers.”
Mch. 24—JAMES B. BINKS.—“Iron Manufacture,” illustrated by Diagrams
and Models.
Mch. 31—J. G. GOODCHILD, F.G.S., F.Z.S.—“Fowling.”
April 7—H. L. BARKER.—“Earthquakes and Volcanoes.”

BRAMPTON LITERARY AND FIELD NATURALISTS'
SOCIETY.

SESSION 1885-86.

President G. J. JOHNSON, Esq.

Vice-Presidents.

Rev. S. FALLE.

Rev. H. J. BULKELEY.

Treasurer ISAAC B. HODGSON.

Hon. Secretary C. J. RIGG.

Committee.

J. THOMPSON
G. BURTON
J. FARRER
W. HUGILL
T. RIDLEY

Dr. WOTHERSPOON
Mrs. H. Y. THOMPSON
Miss BELL
Miss MACQUEEN
Miss THOM

The following MEETINGS were held during the Session :—

1885.

Oct. 8—SOCIAL MEETING.

Oct. 27—Rev. H. WHITEHEAD.—“Brampton 17th Century Presbyterians.”

Nov. 9—Mr. R. HORNSBY.—“Agriculture : its Antiquity, Progress, and Importance.”

Nov. 24—CARLISLE MICROSCOPICAL SOCIETY.

Dec. 8—Rev. ADDISON CROFTON.—“Old Drinking Customs.”

Dec. 22—Mr. J. B. LEE.—“Some things about Law.”

1886.

Jan. 12—Conversazione.

Jan. 19—Rev. C. F. GUNTON.—“Music.” (Illustrated.)

Jan. 26—Dr. H. Y. THOMPSON.—“The Chemistry of the Air we Breathe.”
(Illustrated by numerous Experiments.)

Feb. 9—Rev. H. J. BULKELEY.—“Eminent Persols who died in 1885.”

Feb. 23 Magic Lantern Entertainment.

Mch. 9—Mr. H. JACKSON.—Debate : “Compulsory National Insurance
against Pauperism.”

Mch. 23—Rev. S. FALLE.—“Sign Boards.”

April 2—Mr. J. G. GOODCHILD. - “Birds of Prey.”

PENRITH AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

5TH SESSION, 1885-86.

President Rev. EDW. W. CHAPMAN, M.A.

Vice-Presidents.

Rev. J. H. OUSTON.

W. B. ARNISON.

Treasurer J. B. SHAWYER.

Secretary H. M'LEAN WILSON, M.B.

Committee.

Rev. W. M. SCHNIBBEN.

T. LESTER.

J. G. GOODCHILD, H.M.G.S.

Rev. H. WHITEHEAD.

J. THOMPSON.

GEORGE WATSON.

F. KING.

G. V. SMITH.

J. SIMPSON YEATES.

C. H. GRAHAM.

The following MEETINGS were held during the Session:—

1885.

Nov. 5.—CONVERSAZIONE and Annual Meeting.

Nov. 12.—C. H. HIGGINS, Esq., M.D.—“Who wrote the Plays ascribed to Shakespeare?” Lecture 1.

Nov. 19.—C. H. HIGGINS, Esq., M.D.—“Who wrote the Plays ascribed to Shakespeare?” Lecture 2.

Dec. 3.—GEO. WATSON, Esq.—“Anne Clifford, Countess of Pembroke.”

Dec. 10.—Rev. H. D. RAWNSLEY, M.A.—“Personal Reminiscences of a Tour from Cairo to Mount Sinai, in the Track of the Children of Israel,” illustrated by Photographs.

Dec. 17.—C. REDDIE, Esq., D.Ph.—“The Chemistry of Combustion,” illustrated by Experiments. Lecture 1.

1886.

Jan. 7.—C. REDDIE, Esq., D.Ph.—“The Chemistry of Combustion,” illustrated by Experiments. Lecture 2.

Jan. 14.—J. N. HETHERINGTON, Esq.—“The Rise of Periodical Literature.”

Jan. 28.—The Right Rev. the LORD BISHOP OF CARLISLE.

Feb. 4.—HENRY MARTEN, Esq.—“Fifteen Years in New Zealand.”

Feb. 18.—Rev. J. S. OSTLE, M.A.—“Notes on Cumberland Dialect.”

Mar. 4.—Rev. H. WHITEHEAD.—“George Fox, the Quaker.”

Mar. 25.—J. G. GOODCHILD, Esq., H.M.G.S.—“Fowling.”

WINDERMERE LITERARY AND SCIENTIFIC
SOCIETY.

4TH SESSION, 1885-86.

President H. W. SCHNEIDER.

Vice-Presidents.

E. P. STOCK. | B. A. IRVING.

Secretaries.

W. C. MACDOUGALL. | FRANK BARTON.

Treasurer JOHN HOLLAND.

Delegates.

G. HEALEY. | T. THOMPSON.

Committee.

J. W. ATKINSON. J. T. BOWNASS. J. R. BRIDSON. J. BELL. W. E. BOND. R. CLEGG. F. CLOWES. H. CROSSLEY.		T. DOBSON. G. HEALEY. R. MORGAN. A. RAWSON. J. ROBINSON. W. TAYLOR. T. THOMPSON. W. V. YATES.
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The following MEETINGS were held during the Session :—

1885.

Oct. 15.—CONVERSAZIONE.

Oct. 19.—Mr. FREDERICK GALE.—“Story of Newspapers from the time of Oliver Cromwell till now.”

Nov. 23.—Rev. J. BULKELEY.—“Two Months in Italy and Switzerland.”

Dec. 7.—Miss BASKIN.—Dramatic Recitals.

Dec. 21.—Members' Meeting. Mr. B. A. IRVING will open a Debate on the subject—“That Bounties are Pernicious.”

1886.

Jan. 11.—Rev. A. RAWSON.—“Migration, Food, and Nests of Birds.

Jan. 18.—Professor FRANK CLOWES, D.Sc.—“Accidental Explosions.”

Feb. 1.—Mr. FRANK BARTON.—“Mendelssohn—with musical examples.”

Feb. 15.—Rev. G. E. P. READE.—“Lord Clive and the Foundation of the British Empire in India.”

Mar. 1.—Mr. T. HART, F.G.S.—“The Sculpturing of the Earth's Surface by Denudation, and How Hills and Valleys are Formed,” illustrated by maps and sections.

Mar. 22.—Mr. J. G. GOODCHILD, F.G.S.—“The Lion and its Kindred.”

Report of the Association Secretary,

FOR THE YEAR 1885-86.

THE past year presents a few features calling for remark in the work of the Association.

The Council are glad to congratulate Members on the fact that in place of the heavy deficits of the last two years, amounting last June to over £26, the Association has this year an estimated balance in hand of over £3. This is not owing to increased membership, the number of Members being nearly the same as last year, viz.—1283 as against 1290. It is due, partly, to greater economy in the cost of publishing No. X., which has necessarily had to be curtailed in bulk, while fewer copies have been printed than usual; partly, to the decreased expenditure incurred at last year's Annual Meeting; and partly, the Council are glad to observe, to the increased demand for the *Transactions*, especially of the earlier numbers, during the past year.

The Council trust that the circular issued by their desire to Local Secretaries, impressing on them the importance of endeavouring to extend the sale of *Transactions* in their respective districts, has not been altogether without avail.

Still, they feel that Members as yet do not generally realize the value of the Publication, as they think its merits deserve. As an example:—Six Societies out of the ten, with a total membership of 590, take altogether only one hundred copies; and, but for the commendable action of the Penrith Society, which, like that of Carlisle, has resolved on presenting its Members with copies (an example which every Society, whose funds permit, might, the Council think, with advantage follow), the sale of No. X. would have fallen short of that of even last year.

The Council have to report with much regret the secession of the Whitehaven Scientific Association during the year. This would appear to be mainly owing to the objection of that Society to the Rule which requires papers inserted in the *Transactions* to be both original and local in character. The Council have always held that the distinctive value of an annual publication like the *Transactions*, which records for future reference the work of the Societies, is largely due to their adherence to this Rule, and they see no reason for materially altering that view, though they are

willing that "Abstracts" of papers not necessarily of that character should, subject in every case to their sanction, be occasionally admitted, when such papers are of especial value.

The Council have decided that the Association shall be represented this year at the annual meeting of the British Association, with several important Committees of which learned body, the co-operation of local Societies is cordially invited. The Delegate's Report will be printed in the next number.

There is reason to regret that there has not been, hitherto, that demand for the Publications of Societies which exchange *Transactions* with us, as would encourage any large development of the exchange system at present. The printed list in the next No. will show that the Association possesses a fair number of more or less valuable works (especially the splendid Publications of the United States Geological Survey, and the Memoirs of the Geological Survey of Great Britain), which the Secretary would be only too glad to distribute among Societies requiring them.

In conclusion, the Council can only express the hope that the present year may prove an auspicious one in the interests of the Association, and of the Societies affiliated to it, which it desires to assist in every way possible, and with which it wishes to be more closely and thoroughly identified in the future than it may have been in the past. The Association cannot, however, do the full work it was intended to do, without the necessary funds; and the Council now appeal to each individual Member to do what he can for it, chiefly by making better known, and thus increasing the sale of the *Transactions*, and by trying to augment the list of its Associate Members not belonging to any Society. They trust it will thus, in time, be enabled to accomplish the work which its lamented founder so untiringly laboured that it might be enabled to effect, viz.—to encourage and assist local scientific and literary research, and also to help to diffuse the love of these pursuits among the people of the two counties over which its influence extends.

Society	No. of Members on whom Grant is paid.	Copies taken of No. X.	Terms
Whitehaven	... 264 ...	80	Free to Associate Members
Keswick	... 141 ...	40	To Members at 1/-
Maryport	... 92 ...	66	Free to Gentlemen; Ladies at 1/-
Longtown	... 61 ...	7	To Members at 1/-
Carlisle	... 135 ...	110	Free to Members
Ambleside	... 113 ...	25	To Members at 1/-
Silloth	... 73 ...	7	To Members at 1/-
Brampton	... 80 ...	9	To Members at 1/-
Penrith	... 180 ...	150	Free to Members
Windermere	... 120 ...	12	Members at 1/-
Assoc. Members	... 24 ...	24	At 1/-
Total	1283	530	

Cumberland and Westmorland Association for the Advancement of Literature and Science.

BALANCE SHEET FOR THE YEAR ENDING APRIL 30, 1886.

1885	RECEIPTS.		PAYMENTS.
Balance brought forward	£23 15 1		Messrs. Coward for Printing
Grant due 1884-5 3 15 6		No. IX. ...
Subs. do. do. 1 4 0		£52 15 9
<i>Trans.</i> sold No. IX. (129)	6 9 0		Authors' Copies ...
Back Numbers 0 10 0		... 5 1 11
1886			Postage of <i>Transactions</i> ...
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<i>Trans.</i> sold No. X. (470)	23 10 0		... 0 17 0
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- 1 United States Geological Survey Annual Reports for 1880-81,
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- 2 Transactions of Yorkshire Naturalists' Union for 1882 and 1883.
- 3 Do. of Essex Field Club, 1883-84.
- 4 Do. of Bristol Naturalists' Society, 1882-83, 1883-84,
1884-85.
- 5 Do. of Burnley Literary and Scientific Club for 1883,
1884, 1885.
- 6 Do. of Berwickshire Naturalists' Club for 1882, 1883,
1884.
- 7 Do. of the Midland Union of Natural History Societies
for 1881, 1882, 1883, 1884, 1885.
- 8 The Proceedings of the London Geological Society for 1880-81,
1881-82, 1882-83, 1883-84, 1884-85.
- 9 Transactions of the Birmingham Natural History and Micro-
scopical Society for 1883 and 1884.
- 10 The Memoirs of the Geological Survey, Vols. 1 & 2 (Pts. 1 & 2).
- 11 Do. do. do. Decades 1 to 13.
- 12 Mineral Statistics of the United Kingdom, 1864 to 1873.
- 13 Iron Ores of Great Britain, Parts 2 and 3.
- 14 The Geology of Londonderry (Portlock).
- 15 Guide to the Geology of London (Whittaker).
- 16 Catalogue of Models in Jermyn Street Museum.
- 17 Do. of Publications of the Geological Survey (1884).
- 18 Transactions of the Hertfordshire Natural History Society
(2 Parts, 1886).
- 19 Do. of the Norfolk and Norwich Naturalists' Society,
1884-85.
- 20 L'exposition Géographico-Botanique de Copenhague.
- 21 Vol. 2 (No. 1) Memoirs of the Geological Society of Russia.

HOW CUSTOMARY TENURE WAS ESTABLISHED IN WESTMORLAND.

BY G. GATEY.

(Read at Ambleside, March 20th, 1885.)

A PAPER was read before this Society a few sessions ago by Mr. Heelis, upon the Customary Tenures of Westmorland,* in which the peculiar customs incident to these tenures were explained and the history of the Barony of Kendal was minutely investigated. I do not propose to go over the same ground, but rather to begin where that paper ended, and to endeavour to explain how it was that the peculiar customs now existing in the Baronies of Westmorland grew into existence, and the reason why the tenure of land in this small portion of the country is unlike that prevailing in any other portion. I shall not state either the law or the facts relating to this question with the precision observed in a legal document, but I shall endeavour to deal with it so as to be intelligible to everyone.

It may be assumed roughly that the distinctive peculiarities of the customary estates in Westmorland, as distinguished from freeholds, are as follows:—If the owner of a freehold estate dies without making a will, his widow is entitled to one-third of the profits during her life; but in the case of a customary estate, the widow is entitled to the whole of the profits during her life. In both cases, subject to the widow's right, the estate descends to the eldest son; but if there are no sons, in the case of freeholds,

* Transactions Cumberland & Westmorland Association, No. IV.

the estate goes amongst all the daughters equally ; but in the case of customaryholds, the estate goes to the eldest daughter, to the exclusion of her younger sisters.

These may be considered the distinguishing characteristics of the tenure, but in addition there are peculiarities as to the method of conveyance ; there are small annual rents payable to the lord of the manor, and certain payments to be made on the death of the lord or the tenant, and my object to-night is to endeavour to trace how these peculiarities arose, and how it is that they have been preserved intact up to the present time. In order to do this, I shall have to go back to the time of the Norman Conquest and the old system of feudal tenure. With the exception of a few isolated cases, such as the case of Westmorland, the whole of the lands in England may, roughly speaking, be considered as being either freehold or copyhold. Their origin is distinctly traceable, and dates from the Norman Conquest.

As soon as the Normans obtained possession of this country, much land was without any owner, as they had killed many of the original owners of the land, or driven them from their estates. The king accordingly rewarded his more conspicuous followers by grants of the land so left without an owner. These grants were originally of considerable extent, and were chiefly given to the nobles about the court, or to those who held high rank in the army. They, having neither leisure nor inclination for a pastoral life, did not attempt themselves to bring the land into cultivation, but retained a dwelling-house and a considerable tract of land in their own hands. They allotted out other portions to farmers, on condition of their keeping their lord's land in cultivation, and the remainder was allowed to be common land for the joint feeding of the flocks of both the lord and his tenants. The land retained in hand by the lords being subject to no services except a nominal duty of homage and fealty to the king, became freehold, and was conveyed as freehold from hand to hand by mere delivery of possession. The land kept by the tenants gradually by custom was allowed to pass from father to son, or from the tenant to a purchaser from him, until a right to convey the property grew up,

although nominally the holding was at the will of the lord, and the lord exacted certain services which were afterwards commuted into money payments, and he retained all timber and mines upon the property; and this property is now what is known as copyhold.

In form, the conveyance of a copyhold estate is to this day a surrender to the lord of the manor, who admits the nominee or the tenant as the new tenant, his right of veto having ceased to exist, although for a long time it was in active operation; and by custom copyhold estates follow freehold in their method of descent.

These two classes of property—freehold and copyhold—embracing as they do almost the whole of the land in England, it becomes of interest to trace how it is that the land in this immediate neighbourhood should form an exception to the general rule. The writers on the subject of the tenures of land treat customaryholds with scant notice: none of them seem to have thought it worth while to ascertain the real state of the case; and, as a rule, customaryholds and copyholds are treated as one and the same thing; and there is no doubt that they do possess certain points of resemblance, but they also possess essential points of difference. The method of conveying a customaryhold estate is by an ordinary deed of conveyance, and the purchaser is afterwards admitted tenant upon the Court Roll; but, whereas the copyholder is said to hold at the will of the lord, there is no such restriction in the case of a customaryhold, and the admittances of customaryholders seem to have been merely for purposes of registration, the admittance being in no way necessary to complete a conveyance. Again, the timber upon customary estates belongs to the customaryholder, and not to the lord of the manor, in which respect the customaryholder is superior to the copyholder; and although the mines and minerals beneath the customaryhold estates belong to the lord of the manor, the reason of this will be shown hereafter as not derogating in any respect from the nobility of the tenure.

The explanation of the existence of this peculiar tenure in this portion of the country is an easy one, and one which will, I trust,

appear satisfactory when I have given it, although I must admit at the same time that many of the deductions are simply my own, as I have not anywhere been able to find any treatise which has gone into this subject in a satisfactory or exhaustive manner. Now, although the system of tenure which eventually resulted in freeholds and copyholds, which I have before mentioned, was satisfactory enough in all settled parts of the country, it was necessary that special precautions should be taken near to the border.

As may readily be imagined, the only natural bulwark against the inroads of the Scots was the range of hills forming the present watershed between the northern parts of Cumberland and Westmorland and the remainder of those counties on the south. The inhabitants of the plains of Cumberland were easily driven back, and it was not until the invaders reached this range of hills that an effectual barrier could be interposed to their further advance, and therefore it happened that the whole of the lands behind this range of hills were parcelled out to warlike men placed here for the purpose of repelling invasion, who held the land upon what was known as border service. The inhabitants of the dales of Cumberland, in return for their lands, had certain military services to perform, such as lighting beacons, carrying warnings, blowing horns, &c., when the Scots invaded the territory; and the men of Westmorland held their farms upon the condition of providing a certain number of horsemen, bowmen, or javelinmen, to take the field against the Scots whenever it was required, this service however being limited to forty days in each year. Now, in order to maintain this service, it was essential that the properties should each provide a fixed number of men, and that that number should not be liable to variation, and also that there should be no liability to any difficulty in consequence of the splitting up of the estates. In early times the leaving of property by will was not allowed, the sale of small portions of an estate was not thought of, and the lands descended from father to son; and as there was a register kept of all the estates and of their owners, and of the number of men to be supplied by each, there was no difficulty in at once summoning the men necessary to protect the borders. Now, if, as in the case

of freeholds, the widow of a tenant had been entitled to one third of the property for her life, or if, there being no sons, all the daughters had had the property subdivided amongst them, there would have been no certainty as to the number of men to be obtained from any particular person or estate when required, as possibly in a small tenement providing only one man for service, the widow might have had to provide one third, and the son the remainder, which might have produced a difficulty; and this being the case, it became necessary to make some arrangement by which there should be absolute certainty that the assistance required should be forthcoming. This was done by adopting a system which has now become one of the distinguishing characteristics of Westmorland customaryholds, namely, that the widow shall be entitled to the rents of the whole property for her life, and that the eldest daughter shall take to the exclusion of her younger sisters. By this means each estate was kept whole and undivided, and to this custom of keeping estates in one hand may in great measure be traced the existence down to recent times, of the large body of Westmorland statesmen whose estates, unaltered, had been in their families for generations; for it became not only a legal custom, but also an honourable tradition, that the estates should not be diminished or parted with.

There is no doubt whatever that the customary tenants of Westmorland paid very dearly for their estates, for although they paid no rent, they often paid with their life's blood for the possession of their small holdings; and things continued in this way until long after the remaining portions of the country had settled down to peaceful avocations; and it was not until the reign of James I., when the thrones of England and Scotland became united, that the necessity for border service ceased. That king, like all the Stuarts, was frequently in want of money, and he began, after he had been a short time upon the throne, to wonder by what means he could replenish his exhausted exchequer; and amongst other things, it struck him that if he were to take into his own possession the whole of the lands in Westmorland which had been held upon border service, they could be sold for a large sum

of money, or could be let so as to produce a considerable revenue, as the old border service by which they had been held had become a thing of the past, now that he was king of both England and Scotland. In order to effect his purpose and yet not to appear too prominently in the matter, the king in the twelfth year of his reign granted to his son Charles, Prince of Wales, the unfortunate Charles I., the whole of the crown manors in Westmorland, and then, in order to keep up a certain show of legality, the Prince of Wales commenced proceedings in Chancery to have it declared that the Westmorland customary estates belonged to him under the king's grant, and that the claim which was set up by the tenants of customary estates was bad, as the service in respect of which it was claimed had become obsolete. The tenants of the manor filed their answer in Chancery, setting forth their claim; and in several cases tenants were evicted without waiting for the more tedious process of the law.

The customary tenants of Westmorland were now in a sore strait; they saw before them only two courses open, either of which was most distasteful to them: they must either give up the lands which they and their ancestors had held by honourable service for centuries, or they must rebel against their sovereign; and on the 2nd of January, 1620, an event occurred memorable in the history of this county. On that day, all the prominent customary tenants of Westmorland assembled in the churchyard of the little old church at Staveley, in order to discuss their position, and to decide upon what course they should take. The meeting was summoned by James Smith, high constable of the county, on the pretence of viewing a bridge, and deciding as to its repair; but it was thoroughly understood by the tenants what this pretence meant, and they mustered there from all parts of the county; they then and there passed a number of resolutions binding themselves to the utmost of their power to defend their homes and their properties from spoliation; but at that time they qualified the resolution by agreeing to undertake such defence only so far as they lawfully might. Samuel Knipe was chosen to be agent and manager to the tenants in this matter, and it was decided to

present a petition to the king to allow the ancient customs of tenant right; and it was further decided to present a bill in Parliament to establish those rights.

The bill was duly presented to the House of Commons, but was rejected by them; and on the 28th of July, 1620, the king published a proclamation suppressing all customary estates, and abolishing all tenure by border service. The tenants met again, and published a remonstrance, in which they did not confine themselves to peaceable expressions, but stated their intention of resisting to the utmost all attempts to deprive them of their property. Upon this, proceedings were at once commenced in the Court of Star Chamber against those who were known to have had a part in this remonstrance; and it is worth while to chronicle the names of those men who stood forward in the defence of their lands, and even at the risk of their lives protested against so unjust a forfeiture. They were—Anthony Wetherell, vicar of Kirkby Stephen, who drew out the protest; Samuel Knipe, James Smith, John Cartmell, Thomas Prickett, John Beck, Rowland Harrison, Robert Mawson, Francis Washington, and Edward Tarne, who were charged with taking part in a riotous assembly at Staveley Chapel on the 2nd of January, 1620. James Smith, the high constable, was further charged with summoning the petty constables under pretence of considering the repair of a bridge; Robert Rawes, William Duckett, Francis Washington, Thomas Washington, Edward Tarne, Rowland Harrison, Richard Helm, Arthur Briggs, and many others, were charged with subscribing to the expense of resisting the king's decree. It is interesting to notice amongst these names many surnames which are still prominent in the county, and it is also a matter for comment that the name of Washington appears twice over, when we remember that George Washington, the great American liberator, was himself a Westmorland man: and in all probability these were his ancestors who were suffering in the cause of liberty; showing that their great descendant inherited his spirit of independence from his Westmorland forefathers. The Court of Star Chamber could not make up its mind upon the question; it was presided over by a very able

man, whose reputation has come down to posterity somewhat sullied—Francis Bacon, Lord Verulam ; but whatever else he was, there can be no doubt that he was a clever lawyer, and able thoroughly to appreciate the strength of the tenants' case, and therefore the Court of Star Chamber reserved their judgment as to the rights of the customary tenants, and said that they would hold their decision over until after the trial at the Carlisle Assizes of those who were accused of riotous assembly.

His Majesty, King James, seems to have been equal to the occasion. He forthwith wrote a letter to the Bishop of Carlisle, instructing him that certain of the inhabitants of Westmorland had been guilty of unlawful assemblies and publishing seditious proclamations in maintenance of their pretended custom of tenant right, and that he, in order to avoid the inconvenience that might happen from the insolence of such people, had given command to the judges of assize to give no countenance to any estate claimed to be customary, or having reference to border service ; and further instructing the bishop to confer with the judges upon the subject, to see that they proceeded in conformity with the king's directions. Nothing can show better than this the state of thralldom in which even the Courts of Justice at that time were ; and it is difficult for us in the present day to understand the possibility of any king so far forgetting himself as to try to influence judges, or of judges permitting themselves to be so influenced. Nothing, however, seems to have come of the king's interference, as he was taken ill about this time, and the judges therefore postponed coming to any decision until they were forced. Fortunately for the customary tenants of Westmorland, King James shortly afterwards died, before the Court of Star Chamber had been coerced into coming to any decision. So soon as he was dead, the judges decided according to law and right ; and the Court of Star Chamber, on the 9th of June, 1625, passed the decree which confirmed to the tenants of Westmorland their customary estates in perpetuity, to be held according to those honourable customs which had distinguished them. That decree was subsequently confirmed, and a commission was issued which settled the amount of fines

and fees payable in respect of admittance to the property, and also the rents payable in lieu of border service, which had now become unnecessary.

The whole of the tenants of Westmorland, however, did not wait until the struggle was fought out to the bitter end, for many of them, including the tenants of Grasmere, Langdale, Loughrigg, Clappersgate, Rothay Bank, Ambleside, Troutbeck, Applethwaite, Undermillbeck, Winster, and several others, combined, and knowing that the king's opposition to their custom was merely a device for the raising of money, contributed amongst them the sum of £2700, which they paid to the king, who forthwith became satisfied that their rights were good and lawful, and proceeded to confirm them without any difficulty; and the confirmation of those rights states that the customary tenants and their ancestors have from time immemorial been seized to them and their heirs of good and lawful customary estates of inheritance called tenant right, which customary estates are divisible according to the course of descents at common law, save only where a customary tenant dieth having no heir male of his body, his customary lands descend to his eldest daughter, sister, or cousin, and not all the daughters as heirs female or coparceners; for which premises they have been accustomed to pay certain yearly rents or fines, namely: two years' rent by change of lord by death, and three years' rent for change of tenant by death or alienation, except the tenants of Ambleside and Troutbeck, who pay one year's rent upon change of lord, and two years' rent upon change of tenant.

A question here arises—why should the tenants of Ambleside and Troutbeck pay only one year's rent where the others pay two? and that question I think, although it is lost in antiquity, is capable of a reasonable explanation. The fine payable upon the death of the lord or upon the accession of a new tenant, was to enable the new lord to purchase his knighthood, or to pay the cost of registering the tenant upon the manor books. The tenants of most of the lands had a considerable beneficial enjoyment in their property, and the services which as a rule they were required to render were by no means commensurate with the amount of benefit they

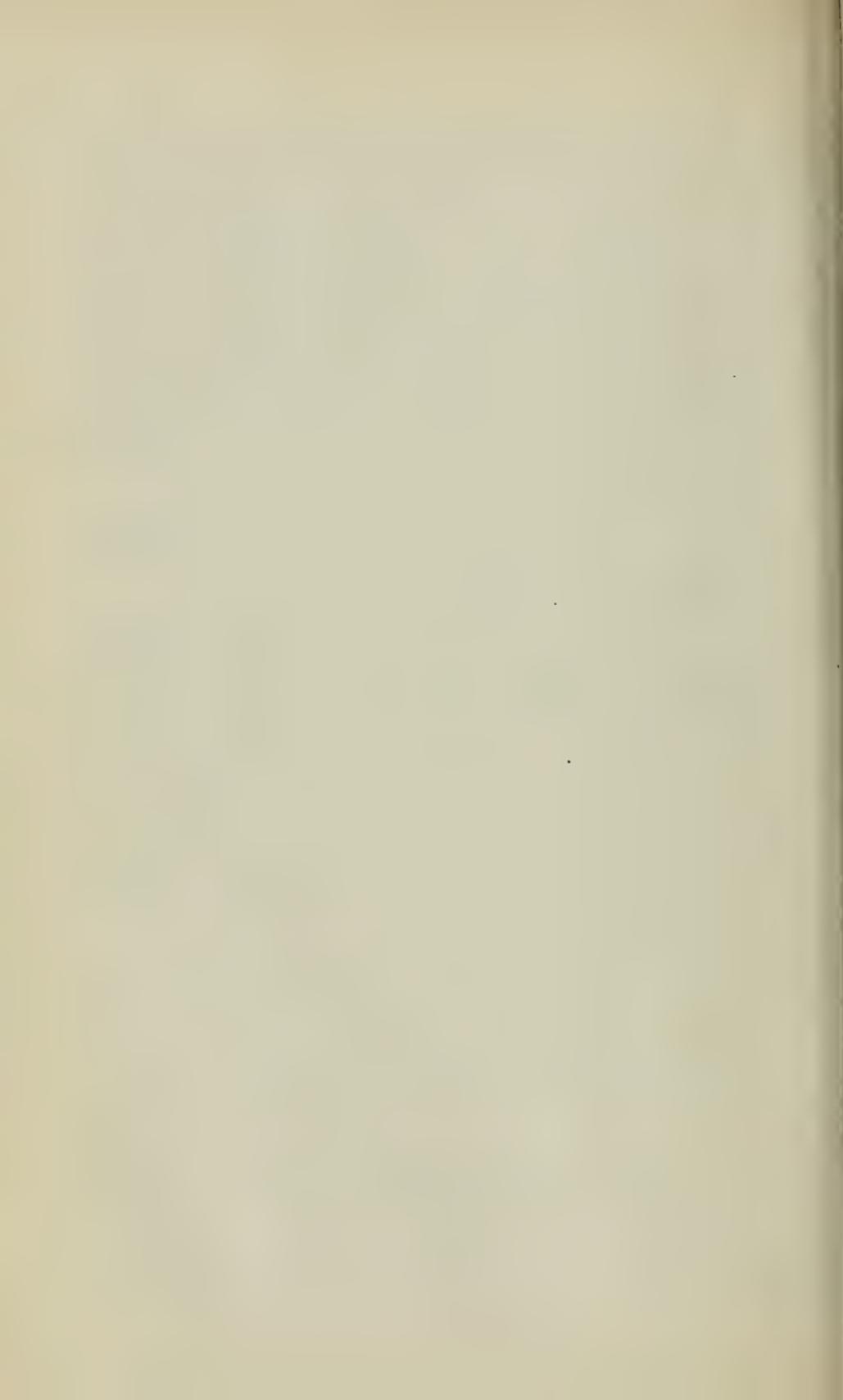
obtained ; but in the case of the tenants of Ambleside and Troutbeck it was not so. When the Scots invaded the borders, they made hurried raids on horseback, and to horsemen there were only two passes reasonably accessible by means of which they could invade the fertile lands of lower Westmorland ; one of these was by way of Dunmail Raise, and the other by Kirkstone Pass. The former, however, had to be approached by means of narrow valleys, where much opposition would have to be met with from the inhabitants, and it did not afford nearly so tempting a means of approach as Kirkstone Pass, the way to which was over level country until Ullswater was reached, and then that valley, which was sparsely inhabited, afforded admirable means for a retreat. The result was that the duty of defending Kirkstone was by far the most serious one, and this naturally devolved upon the tenants of Ambleside and Troutbeck. Their services were consequently arduous, and a tenant was not willing to pay a large fine on succeeding to his father's property, as the succession in itself entailed so much danger and hard work as to be a doubtful benefit ; this being so, the lord of the manor was only too glad to admit the tenants on payment of the smallest possible fine, which was one year's rent.

Writers upon the subject of tenures of land often class customary-hold as copyhold, upon the ground that the lord of the manor is entitled to the mines and minerals ; but this arises from a mistake. The ownership of mines and minerals was vested in the Crown in all crown manors ; and when King James made his bargain with the tenants, he took good care not to part with more than he could help : and so the minerals to this day remain in the lord of the manor. Charles II. granted the Westmorland crown lands to his wife as a jointure, and after her death these crown manors were granted to the Lowther family, in which family they still continue.

It will be evident therefore, from what I have said before, that the customary estates of Westmorland were from their very origin freehold. The peculiarities of the service required in respect of them gave rise to the customs which still exist, and these customs

in the course of time acquired the force of law. That notwithstanding an attempt by the Crown to disturb these tenures, they were finally established in, or shortly after, the reign of James I., and they have ever since continued to exist with their distinguishing customs; and that customary tenure in Westmorland arose in the first instance from the peculiar circumstances of the case, and was ultimately established by royal decree; and that notwithstanding certain peculiarities which they possess in common with copyholds, they are freeholds of the most honourable sort, being held by military service, which was considered superior to all others at the time of its institution.

I am afraid that I have not endued this subject with all the interest of which it is capable; but at the same time I cannot but feel that it is a subject which is deeply interesting to all inhabitants of Westmorland; and that it is one over which it is worth while to pause and consider, at a time when there is every probability that one of the earliest acts of domestic legislation will be the passing of the bill for the abolition of customary and copyhold tenure.



THE HILL NATURALIST.

BY WILLIAM HODGSON, A.L.S., WATERMILLOCK.

(Read at Carlisle, 1884.)

THE late H. C. Watson, author of the "Cybele Britannica," divides the surface of the earth into six climatic zones, four of which are represented in the Lake district—the coldest and the warmest of the series being alike excluded. The lowest, which Mr. Watson calls the Midagrarian, extends from 0, or sea-level, to an altitude of 900 feet. This zone is marked by the presence of fruticose *Rubi* or Brambles, *Ulex* and *Alnus*. The next zone, Superagrarian, extending from 900 to 1800 feet, is marked at its upper limit, which is about the height of Wester Mell Fell or Calva, by the cessation of *Erica*, *Pteris*, and *Digitalis*, or Cross-leaved Heath, Common Bracken, and Foxglove. The third, or Inferarctic zone, ranging from 1800 to 2700 feet in altitude, includes all our mountains intermediate in elevation between Mell Fell and High Street, Coniston Old Man, or the Red Pike. The line of demarcation between this and the Mid-arctic zone, which includes all our loftiest peaks, is marked generally by the cessation of *Calluna* in an upward, and of *Salix herbacea* and *Carex rigida*. Of course, while working away on the hills, you will here and there encounter individuals of the species here enumerated, that, favoured by peculiar circumstances of soil or aspect, as exposed to the sun or otherwise, have strayed beyond the limits here assigned to them. Should any of our botanical friends meet with such

wanderers, I would strongly advise them to make a note of the time, place, and surroundings of each.

Generally speaking, the great bulk of our grasses and the major part of our indigenous shrubs and forest trees, may be set down as occurring within the limits of the Midagrarian zone, or at an altitude of less than 900 feet. The exceptions will be noticed by and bye. With the London Catalogue in my hand, I will endeavour in the order there set down, to particularise a few of the plants characteristic of our Lakeland Flora which are to be found at an elevation of 900 feet and upwards.

The first species that occurs is *Thalictrum alpinum*, a diminutive but very pretty little plant which I have seen growing in rills on Helvellyn, or on the surface of moist rocks over the Red Tarn, at the very spot where the unfortunate Mr. Gough met with his melancholy fate in the spring of 1806. *Thalictrum minus*, v. *montanum*, is found on the cliffs of Catchedicam. Several of the Crow-foot family, as *Ranunculus lenormandi*, *R. hederaceus*, *R. flammula*, *R. acris*, and others, inhabit fell becks and moist situations up to an altitude of 2000 feet, and in some instances still higher. I have seen *Aquilegia vulgaris* growing on the face of perennially-dripping rocks over Douthwaite Head in Matterdale. *Corydalis claviculata* appears about the bases of our mountains in many of the dales. Comparatively few of the Crucifers attain an elevation exceeding that of common cereal tillage. *Cardamine sylvatica* grows on Yew Crag over Ullswater; and *Cochlearia officinalis*, and its variety *alpina*,* may both be met with in running water up to an altitude of quite 3000 feet. *Teesdalia nudicaulis* grows on Carrock, Place Fell, Swarth Fell, etc., and is most frequently met with where the surface has been disturbed. *Helianthemum vulgare*, a limestone-loving flower, is found about Park Head on Warnell, and on some of the calcareous hills of Westmorland. *Viola palustris* in bogs, and *V. lutea* on dry mountain sides, are of common occurrence; while the different species of *Drosera* may all be discovered in boggy localities, *D. rotundifolia* being, however, far the most

* Mr. J. G. Baker, F.R.S., of the Kew Herbarium, refers all the upland Scurvy-Grasses to the variety *alpina*.

frequent. *Silene acaulis* is found on the rocks near Grisdale Tarn, where I saw it growing last summer. A still rarer flower, namely, *Lychnis alpina*, was sent to me by Mr. W. Dickinson, who gathered it from Hobcarten, on the Loweswater fells. *Cerastium alpinum* has been found on Dove Crag, a dangerous-looking bluff on Fairfield. *Stellaria nemorum* grows in Fusedale, over Ullswater. *Montia fontana* in almost every "well-eye" on the hills. Several species of St. John's Wort flourish freely in the superagrarian zone. *Malva moschata* is often seen near mountain quarries, where its roots penetrate deeply into the rubbish heaps. *Radiola millegrana* I have seen but once growing in a spring on the southern slopes of Dent, near Egremont. I had frequently seen it stated in old lists that *Euonymus europæus* grew in Gowbarrow parks, and the splendid manuscript Flora compiled by the late Mr. Rooke of Whitehaven, contains a drawing from a specimen procured there, yet I never discovered it until last October, when I found it on Yew Crag, rooting in the rifted rock. None of the Clovers or Vetches attain a great elevation, except perhaps *Orobis tuberosus*, which is not unfrequent in dry rocky woods. Of the Wild Cherries I must speak with considerable diffidence; the most common species here, I take to be *Prunus avium*. Alpine Ladies' Mantle meets us at every turn in the Helvellyn and Scawfell groups of hills. The Common Tormentil is even more ubiquitous; and one of Mr. Baker's last letters informs me that *Potentilla fruticosa* and *Dryas octopetala*, plants of extreme rarity, have both been recently discovered growing upon the rocks over Keppel Cove Tarn. The lucky finder was, I think, Mr. Backhouse of York.

Of the *Rubi*, the species pertaining to mountain districts are *R. saxatilis*, which is fairly plentiful in Airey ravine, Matterdale. *R. chamæmorus* is found in turfy bogs at various stations in the Lake country; the last I remember seeing grew in the Sticks Moss, over the path leading from Greenside Mines towards St. John's Vale and Keswick. The Wild Raspberry is everywhere plentiful. Of the wild Roses, several types occur on the lower slopes of the mountains. In similar stations the Mountain Ash and the Hawthorn flourish luxuriantly. The upland ONAGRACEÆ

are represented by *Epilobium angustifolium* on the rocks over Otterstone, Ullswater; and *E. alsinifolium*, splendid specimens of which grow in the rills which pour down the slopes of Kirkstone towards Brotherswater.

Stonecrops and Saxifrages abound, there being seven species of the former, and eight of the latter, reputed as indigenous to Lakeland. The beautiful Grass of Parnassus is a special ornament on every mountain slope down which the water makes its way from some lofty spring.

Not many umbelliferous plants can be discovered at an altitude exceeding 1000 feet, though the Wild Angelica is occasionally met with. The Common Elder, the Guelder Rose, and the Honey-suckle, are all present in varying situations and numbers. The RUBIACEÆ find representatives in the Mountain-, Marsh-, and Ladies' Bedstraw; and the Marsh Valerian occurs in wet places early in the season.

Of the COMPOSITÆ we have a fair variety. The Marsh Thistle is conspicuously plentiful in wet heathy ground. The Melancholy Thistle grows about Ashness Gill and Beckbottom farm in Matterdale, and the Carline Thistle abounds in Ennerdale and about Gowbarrow Fell. The Cudweeds found are the common form which occasionally shows itself on dry rocky prominences; and *Gnaphalium dioicum*, on Brockle Crag, Skiddaw, and the Side Woods in Ennerdale. *Senecio sylvaticus* is a frequent occupant of hillside quarry grounds. Of the Hawkweeds, in addition to *Hieracium pilosella*, I have found the following—*H. anglicum* on the rocks in Cawdale; *H. vulgatum*, *H. murorum*, *H. corymbosum*, and *H. boreale* occur not unfrequently, especially the last named.

ERICACEÆ.—Bilberry, Cranberry, Cowberry, and the Bog Whortleberry, are all reputed as indigenous on our elevated moors; indeed, I can personally vouch for all except the last mentioned, which I do not remember to have seen. The Bearberry is represented as a native of Martindale Forest. The Cross-leaved and the Fine-leaved Heaths, as well as the common Ling, are everywhere plentifully distributed. The grandest examples of *Erica cinerea* I have ever seen grow in Ennerdale. *Gentiana*

campestris is not rare, and sometimes is found as high up as 1500 feet. *Menyanthes trifoliata*, in marshes and spongy bogs, up to the same altitude as the preceding. Coming next to the SCROPHULARIACEÆ, we find *Verbascum thapsus* inhabiting "scree-beds" in many of our mountain slopes; still more common are the tall flowering spikes of the Foxglove. The last species never fails to quickly occupy the space where timber has been recently cleared. *Mimulus luteus*, a reputed alien, seems gradually becoming established in mountain runners: this is certainly the case in many of the streams that empty into Ullswater. Of the Speedwells, *Veronica officinalis* and *V. serpyllifolia* climb to a higher range than their congeners. Coming to the LABIATÆ, *Mentha hirsuta* and *M. arvensis* follow the streams often to a considerable elevation. The Lesser Skull Cap, on the authority of the late Mr. Dickinson, is found in Thornthwaite, near Keswick. The only time I met with it was about eight years ago, in a spring towards the southern base of Dent Hill, near Egremont, growing side by side with *Radiola millegrana*, which also, by a singular coincidence, I have not seen elsewhere. The Wood Sage abounds everywhere, in dry rocky localities.

Three species of Forget-me-not are met with in our mountain brooks, while the drier banks can boast as many more. The Common Butterwort is a tenant of most springs; and often side by side with it is the Bird's-eye Primrose. The Common Primrose, I may here remark, often blooms until September in lofty cold situations. The Bog Pimpernel delights in spongy boggy places. In such locations, high up in Borrowdale, and also in Glencoin, it may be found when the Grass of Parnassus blooms. The Dock family I may dismiss by stating that the Kidney-leaved Sorrel is found rooting amongst rocks where the soil is moist and peaty, quite up to the summit almost of our highest peaks, at the Pillar, Scawfell, and Helvellyn; on the slopes of which last mountain *Polygonum viviparum* has also been found. The Crowberry, like the Bilberry, and others already mentioned, is of frequent occurrence.

AMENTIFERÆ.—The Oak, Beech, Hazel, Birch, and Alder, all

adorn the lower slopes of our hills, each in the soil most fitted to its growth; while the lowly Bog Myrtle is found in peaty mosses. The Willows, as a rule, do not venture much upwards. An exception, of course, must be made in favour of *Salix herbacea*, which has been found on Skiddaw, the Pillar, Kidsty Pike, &c.; and quite recently, as Mr. Baker informs me, some species heretofore supposed to be indigenous to the Scottish hills, have been found on Helvellyn and Fairfield. Of CONIFERÆ, the Yew and Juniper—the latter known locally as “horse savin”—are both abundant. In our lakes, tarns, and mossy pools, Pondweeds, Water-lilies, Water-starworts, Milfoils, &c., are of common occurrence. The Orchids, again, are mostly plants of meadow and pasture growth. Similarly of the Iris and Amaryllis tribes, Garlics, &c. Of rush-like plants, the supply is more than abundant. *Luzula sylvatica* and *L. congesta*—the former inhabiting bosky dells, often near a waterfall, the latter preferring the upland moors—are frequent; while, independent of the dwarf *Juncus triglumis*, inhabiting Dove Crag or Striding Edge, six other rushes, including the variety *sub-verticillatus*, are reckoned as indigenous to elevated moorish ground. The pretty little *Rhynchospora alba* may be classed as local rather than rare, for while inhabiting wet moors in Ennerdale and Borrowdale abundantly, I have never succeeded in discovering it in the dales converging towards Ullswater. Sedges appear in strong force; apart from those which are distinctly palustral plants of the lower levels, or inhabitants of salt marshes, the following may be found at varying altitudes up to 3000 feet, viz., *Carex pulicaris*, *C. muricata*, *C. stellulata*, *C. ovalis*, *C. rigida*, *C. vulgaris*, *C. glauca*, *C. pilulifera*, *C. præcox*, *C. levigata*, *C. binervis*, *C. flava*, and *C. filiformis*. This last is rare, and extremely local, possibly the lowest in the scale of climatic zones that I have mentioned, as *C. rigida* is one of the highest. *C. flava*, *C. pilulifera*, and *C. pulicaris* often grow as high as the Red Tarn, say at an altitude of 2500 feet.

Coming now to the Grasses, of which I have previously treated at large in a paper read at Workington, I will confine myself to stating that nearly all our indigenous grasses are to be met with in

the lower zone. The few that grow above 1000 feet may be summarised thus : *Sesleria cœrulea*, *Agrostis canina*, *A. vulgaris*, with its variety *pumila*, *Aira flexuosa*, *A. cœspitosa*, *A. caryophyllea* and *A. præcox*, *Triodia decumbens*, *Melica nutans*, *Poa alpina*, *P. annua*, *P. pratensis*, *Festuca ovina*, *F. vivipara*, *F. sylvatica*, and *Nardus stricta*. The last frequently marks the line of demarcation between the gramineous and the heathy coverings of our hills.

Of the Ferns I have spoken before the Penrith Society ; only I may be permitted to enter my earnest protest against the ruthless and indiscriminate way in which these elegant adjuncts to the plant life of Lakeland are being rooted up and exterminated. In the Keswick neighbourhood, once famous for its *Osmunda regalis*, that plant in a wild state is now already a thing of the past. Others of the Filices are undergoing the same fate, and I would implore the members of this and kindred associations to use every influence at their disposal to arrest the mischief. A fern new to the district has quite recently been discovered, the precise location of which I could not venture to make public. Lycopods and Equiseta we possess in great variety as well as abundance. Of the Mosses and Lichens, whose name is legion, I cannot now speak.

I will now proceed to make a few remarks on the feathered occupants of the hills. We are told that Birds of Prey were once much more common than they are now. The Eagle Crags, Falcon Clints, &c., met with in our excursions, still testify to this. Within living memory, the Kite or Glead or Fork-tailed Hawk, as he was commonly styled by the dalesmen, has disappeared. One well remembered nesting place of this bird—full in sight from the place where my notes are written—will know its old occupants never again. The Raven yet croaks occasionally from Priest Crag, still nearer to my house ; but he no longer ventures to establish his nursery there, though aged men recollect when in their school-boy days, to rob his nest was a favourite exploit with them, not unattended with a spice of danger. While gamekeepers class all such birds as vermin, and wage merciless warfare against

every member of the orders Falconidæ, Strigidæ, and Corvidæ; when farmers join in the cry in defence of their young poultry and lambs, and evince a sympathy frequently more than a passive one, with the professional corvidicide; can one feel surprised at the gradual disappearance of the Raptores, &c., from our midst, when traps, guns, and poison are indiscriminately used for their extinction? The prodigious increase of field-mice—both the Long and the Short-tailed varieties—in different quarters, must bring about a reaction in favour of the persecuted owls and hawks, especially the Kestrel. Who that has examined the droppings scattered around the vicinity of a Wind-hover's nursery, can fail to recognise his importance as a killer of vermin in the most appropriate and strict sense of the term. Of these persecuted birds there yet remain to us the Peregrine Falcon—growing yearly more rare,—the Merlin, the Kestrel, the Sparrow-hawk, the Common Buzzard, and the Harrier—the last mentioned all but extinct. Of the Strigidæ, the White or Barn Owl, the Tawny Owl, and the Long-eared and the Short-eared species.

Of the Merulidæ we possess the Dipper, whose lively and interesting mode of life can be studied to perfection in our secluded and sylvan glens. The Ring Ousel also breeds with us sparingly, and I regret to record a palpable diminution of its numbers during the past forty years. The Crag Starling, as we call him, comes to us early in spring, and retires as soon as he has assisted in stripping the Rowan tree of its scarlet fruit.

Of the Warblers (*Sylviadæ*), most of them migratory, Lakeland may claim the Wheatear, which breeds in great abundance; indeed, there are some localities where they may be said to swarm like little colonies. The Whinchat also abounds; whilst the Stonechat is comparatively rare. Few old walls are without a pair of Redstarts; and the Blackcap is a real *rara-avis*. The White-throat, the Sedge- and Grasshopper Warblers, the Wood Wren, the Willow Wren, and the Chiff-Chaff all spend the summer with us; while the lively little Gold Crest remains with us all the year round. Several pairs breed within a few yards of my house every season. Both Flycatchers—the Spotted and Pied species—visit

us annually; the latter, I am happy to think, in gradually and steadily increasing numbers. The bird is seldom seen far from water; makes his nest in hollow trees; his pied black and white plumage give him somewhat the look of a magpie in miniature. The Raven, already referred to, still manages to exist, though his nesting places are few and far between; and they are sedulously sought out and persistently robbed of eggs or young. The Carrion Crow breeds in secluded woods. Of Jackdaws we have enough and to spare. At Yew Crag, over Ullswater, is a large colony of these birds, several hundred pairs breeding every year, building their nests in the crevices of the precipice, or impudently appropriating the numerous rabbit burrows with which the place abounds. It is indeed a complete "jackery." The Jay is not unfrequent in the lower woods; he is a very pugnacious fellow, and suffers no intruder to approach his home. I have seen a pair of them quite overmaster a pair of Buzzards, and after a noisy and obstinate conflict—in which the buzzards constantly had the worst of it and retreated for other than strategic reasons—they were driven entirely from the woods which overlook the well-known Stybarrow rocks. The Starlings are also numerous, although they suffered very severely in the hard winters of 1878-9 and 1880-1. This season large flocks have remained with us up to the present date.

Of the Fringillidæ, that sweet little favourite the Goldfinch, has sadly declined in numbers of late years, though I regard it as a hopeful sign that several pairs of them are now in my immediate neighbourhood. The Siskin now and then comes to feed on the seeds of the alder, and is indeed rarely seen except when engaged in foraging among its catkins. I hardly think the Linnet and the Redpole so common as they once were; possibly the abandonment of tillage is responsible for the change, "popple" being deficient in supply. Occasionally one sees a Brambling or a Snow-bunting in winter. Some tourist has written to say that Skylarks are seldom seen about the Lake country. Except in very elevated regions this opinion is without foundation. The Bullfinch is not unusually seen amongst us; and breeds in the upland woods, not caring seemingly to approach too closely to the habitations of men during

the nesting period. The Swallows and the Martins are much more common than the Swift or the Sand Martin; which may be accounted for by the fact that suitable breeding places cannot readily be found. We have few old towers, and fewer sandbanks. The Goatsucker is seldom seen; where noted, it occurs about trees planted near farm-steadings. I have never succeeded in finding a nest of this species. A stray Kingfisher may now and then be seen about the Lakes; where, however, I know no instance of its breeding: its galleries could not be sunk into rock. The Creeper is familiar to such as ramble much in the woods. How amusing it is to watch the parent birds when training their newly-fledged brood in the duty of circling round the stem or branches of a tree. The Cuckoo abounds. I have seen as many as a dozen individuals in company at a time; they seemed strangely quarrelsome, chasing and hurstling each other about, uttering a harsh guttural cry, quite distinct from the ordinary "twofold note." The Stock-Dove has of late years taken up its quarters at more than one station among the hills, where its low plaintive cooing is first heard at the beginning of March. I was greatly astonished to hear its notes last week—a fact attributable no doubt to the openness of the season. Wood-Pigeons abound; in early autumn mornings a dozen or more used to come and breakfast in front of my bedroom windows, their morning meal consisting of the seeds of *Ranunculus acris*, which they picked from the stems with great assiduity.

Of the Grouse, the Black-cock finds a home in groves or young plantations on the breast of the hills, preferring marshy or heathy ground. The Red Grouse is much more common, frequenting the open heath-clad moors, where its nest may be found at the foot of some tuft of heath, a full month earlier than that of the preceding species. Partridges keep to the lower grounds, a remark which is applicable also to the Pheasant. I have frequently made the remark that the hen pheasant is far inferior to the female partridge as a nurse; for while the latter is justly famous for the courage which she invariably exhibits in defence of her young, and the ruses which she brings into play in seeking to entice unwelcome

intruders away from their neighbourhood, the larger bird, when disturbed in her nursery duties, will leave her offspring to their fate with apparent unconcern.

Of the Ardeidæ, only the Common Heron seems to demand passing notice. In the evenings especially, these birds love to haunt the shallow edges of lakes, or the pools of silent glens, in pursuit of fish; and expert fishers they doubtless are. Of heronries we have but few local examples; those in Wythope Woods and at Greystoke Castle being the only stations within my immediate district. Old works on Natural History tell us that a breeding establishment of these birds once existed at Yew-crag in Gowbarrow;—certainly not within living memory has this been the case, yet the mistake continues to be perpetuated.

Of the Scolopacidæ, the Woodcock stands first in the list. In my early days, instances of their breeding in this part of England were extremely rare. I am happy to think the number of native born "longbills" is on the increase. I never until last spring was fortunate enough to make the bird's acquaintance in nesting time. One evening, as I chanced to pass through the grounds at Gowbarrow, I was surprised by the notes of a bird flying over head close to the tops of the trees, with whose peculiar cry I was not familiar. With a low "wisp-wisp-wisp—wap-wap-wap," again and again repeated, it kept flying hither and thither over my head, still keeping apparently to the same line, and never going farther away than from one hundred and fifty to two hundred yards. The bird I found to be a woodcock, but whether he was simply serenading his mate, or warning her of the approach of danger, I cannot undertake to decide. The Common Snipe breeds in boggy upland pastures, sometimes in considerable plenty. Let me say a word or two of the Common Sandpiper—"Willie-lilter" of our dalesmen. I wonder if it ever fell to the lot of any of my bachelor friends here to witness the courtship manœuvres of this interesting bird. How he circles around his mate, uttering the most pleasing notes—displaying his plumage—hopping and dancing about in every most captivating attitude, literally dancing to his own pipes. If not, they have a lesson yet to learn that might be of service to them in

future. My experience was gained in the secluded valley of Ennerdale, through which the Lissa flows towards the lake. The Curlew* comes to us from the swampy coasts about the beginning of March, and retires in the autumn, after rearing his brood upon some elevated and secluded heath. The young are extremely clever in hiding themselves on the approach of danger, of which they are certain to be warned by the old birds. Their nest is rude and inartificial, consisting of a few dried stalks of grass, rushes, or sedges, carelessly drawn together. The Plovers hardly trouble themselves to make any nests at all, but lay their eggs merely in a scratched hollow. I have known a cow's or a horse's footprint to suffice, very few grasses or lining materials being employed. The Peewit is of course common enough. The Golden Plover is a local rather than a scarce bird; he is a tenant for the summer of the higher moorlands, seldom approaching the dwellings of man. The Dotterel is gradually becoming extinct. Anglers are, I am afraid, answerable in a great measure for the decrease. That the Dotterel does yet occasionally breed on the Cumberland moors I had ocular demonstration in 1880, when I most unexpectedly fell in with a brood on Hartside, a lofty moor over Douthwaite Head, Matterdale.

The Corncrake, which has been very abundant in my district this last season, has a singular peculiarity. No actor on the stage can simulate death like this bird. He will suffer himself to be roughly handled on what are commonly considered the tenderest parts of a bird's frame, without betraying the slightest symptom of pain; but drop him on the ground, retire a few paces, and observe him carefully; by and bye he will open first one eye, and then the other, take a cool survey of his bearings, and seeing no danger at hand, walk off with the utmost coolness. The Coot, though frequently met with on many of the lakes, is rarely a visitor to Ullswater. The Water-hen inhabits the lower streams and pools of the plain, rather than hillside torrents.

* During the last two seasons, while dwelling by the Solway, I have seen Curlews crossing the Frith from Kirkcudbright, and flying inland, apparently to reach their breeding grounds.

Of the last order of birds—the *Natatores* or Swimming Birds—brief notice must suffice. The great bulk of them are shore birds only, and if driven inland by accident, are considered as stragglers. The Wild Duck and the Teal rear their young with us occasionally. None of the Wild Goose or Swan family, however, do so. The Cormorant, Goosander, Scaup Duck, and other species, are winter visitors. With one remarkable exception, we know nothing of the extensive family of Gulls: I refer to the Blackheaded Gull, *Larus ridibundus*, which of late years has become a constant visitor to Ullswater. About the first week in March, when Peewits and Curlews re-appear, a flock of several hundreds of these gulls makes its appearance about the middle of the lower reach of the lake, constantly near the same place—between Rampsbeck Cottage on the one shore, and Waterside House on the other. Here their courtship, I suppose, commences; and a noisy business it is. Their screaming—who first called it laughing I don't know—is incessant, and their motions are uneasy. In a little time they depart, the great bulk of them to a series of swampy pools on the south side of Greystoke Park, where there is a gullery or nesting colony. A few of the birds occasionally return to the lake shore and diligently watch the mouths of the different brooks when Minnows are leaving the lake to spawn. Also when the Ghost Moths appear, the black-heads are very active in hawking for them over the surface of meadows and pastures in a summer evening.

PART II.

(Read at Carlisle, 1885.)

DURING the spring and early summer of 1885, three different pairs of Woodcocks were noticed during the breeding season in Gowbarrow Park, Ullswater. On the whole, the belief seems to be gaining ground, that more woodcocks remain with us to breed than was formerly the case. Perhaps it may be that there are more observers now-a-days.

A pair of Buzzards appeared during the nesting season in the locality already referred to, and undoubtedly succeeded in rearing

their brood, although their nesting-place was not discovered. The young birds—which are readily distinguishable from adults of the same species—were frequently observed both by myself and by two of my sons.

Several nests of the Wind-hover, or Brown-hawk—as it is frequently called, to distinguish it from the Sparrowhawk, to which the name of “blue” hawk is often applied—were found during the breeding season. My sons discovered, I believe, seven nests in all during last spring. The Kestrel frequently makes use of an old nest of the Jackdaw among the rocks of Yew Crag. No nests of the Sparrowhawk were seen this season; but we heard of a Merlin’s nest being found on Matterdale Common.

Towards the close of my former paper, I referred to the migrations of the Blackheaded Gull, and its arrival upon Ullswater about the beginning of March in each year. About the middle of May, two of my lads set out to visit the gullery at Greystoke. On their arrival they found the nests—rudely constructed of a few dried stems of rushes or sedges, with which the bog abounds—placed upon little islets of rushes in the centre of the swamp, inaccessible to the pedestrian except by wading. They saw that most of the young were already hatched, and that it was just a little too late to get any eggs. The younger brother waded towards the most promising clumps of rushes, where he managed to secure two or three fine specimens of eggs, and capture one of the callow young among the sedges. This proceeding roused the resentment of the whole colony, and brought the adult members about his ears with hostile intent. They attacked him in a body with such pertinacity that he was glad to invoke the aid of his elder brother in ridding him from his assailants. Their cry is at all times harsh and dissonant, and it smacks of anything rather than the laughter that is associated with their name. Ten days later not an egg remained; but the pools swarmed with young gulls, which paddled about in troops in all directions, generally contriving as quickly as possible to place the width of the pool between themselves and the observer, and sometimes to disappear altogether among the sedges. The old gulls kept hovering about proclaiming their displeasure by

piercing cries; sometimes a number of them, perched upon a line of dilapidated railing which separated the gullery from an adjoining wood, showed to picturesque advantage with their dark chocolate-coloured crowns in striking contrast with the snow-white plumage of their breasts. There is a strongly-marked distinction in colour between birds of this species in their first—probably also in their second—year's plumage, and adult specimens of the same bird. In addition to the gulls, I observed two broods of Coots, and one brood of what I took to be Teal, judging only from the young specimens, as the old birds were much too wary to venture outside the fringe of vegetation, behind which they could so easily and completely shelter themselves from notice. Several Snipes were flushed on the outskirts of the pool; and the characteristic notes of the Peewit and the Curlew were frequently heard in chorus with those of the gulls. Nor were other attractions far to seek. Palustral plants abounded. Bogbean in its latest blooming stage for the season, alternated with Marsh Cinquefoil; both species of Lousewort were present; tufts of Cotton Grass were conspicuous here and there among the more sober-coloured spikes of Sedges, of which last quite a dozen species might have been collected in a few minutes. The finest *Callitriche* I ever saw, of the variety known as *platycarpa*, carpeted the edges of many of the scattered pools. Quite charmed with my visit to such a scene, I turned my back upon it with reluctance and regret.

Turning now to the MAMMALIA of the hill country, I may say that the Wild Cat lingers among the fells of Cumberland only by tradition. The last I ever heard of was captured in Great Mell Fell early in the present century, by the famous pack of hounds maintained by the Squire Taylor of Baldhow of that day, from whom I derived my information more than forty years ago.

I have enjoyed almost unexampled opportunities of inquiring into and observing the habits of the Common Squirrel. At the west end of the school-house at Watermillock is a little grove of larches and other conifers, planted by my own hands in 1845. This grove proved to be the chosen feeding ground of a very fine squirrel, which might be seen morning after morning dexterously

stripping the scaly coating from the cones of the fir, to get at the winged seeds, upon which at certain seasons he largely depends for a supply of food. In hard weather my children were accustomed to feed the little birds, which soon collected about the premises when pressed by hunger. By and bye the squirrel came for his share of the good things. Finding himself protected from any annoyance, "Connie," for so we called him, became pleasantly familiar, and would jump about the threshold, and fearlessly trip up the steps that led into the outer kitchen, encouraged at times by a few grains of Indian corn left specially for him. These he would pick up, and springing upon the garden wall, or running a few feet up the stem of a fine oak tree that grew close to the door, would seat himself upon his haunches, and with tail erect would nibble away at his prize, holding it between his fore paws. The children were not slow in discovering that a crust of bread was greatly relished by their pet, or that the outer skin of a hard baked potatoe was a special delicacy; and great was their delight to see him mount to his chosen perch, and there complacently munch away at the dainties with which they had provided him. As spring advanced he was joined by a mate of the same species. Growing bolder in company, the two would sometimes unite in driving away the little birds, or even the larger poultry, when the latter chanced to be without the protection of the cock, who alone seemed to exercise a wholesome degree of terror over them. From his assaults they could however secure immediate freedom, as well as from the attacks of stray dogs or cats, by taking refuge among the branches of the oak above mentioned; and many an amusing incident such hasty retreats gave rise to, as the active little creatures would peer with an air of scornful complacency at their baffled pursuers on *terra firma*. When provisions abounded, and their appetites were satiated, they would form numerous little hoards of provisions in an adjoining wood, usually not far from the stem of some tree that afforded a ready refuge in case of any interruption to their task of concealment. Many a time have I watched them while questing for such stores, when the ground was covered with snow. They would cross and recross each other's track, quartering

the ground with a sagacity unsurpassed by the trained setter or spaniel of the sportsman. I recollect coming downstairs one morning, and spying through the staircase window one of their number energetically at work on the stem of a tree distant from my point of observation not more than ten or a dozen yards. The squirrel as he worked kept his head downwards—an attitude very unusual with this animal. Calling the attention of some of the household to his apparently inexplicable proceedings, we decided not to disturb the little worker, but after breakfast to go and examine the trunk of the tree upon which he was operating with such apparent earnestness. To our gratified astonishment, we found that he had been sticking little balls of food, first partially softened and formed into pellets about the size of a pigeon's egg, which were visible here and there attached to the bark of the tree. Many of these balls were supported in their position by resting upon patches of moss or lichen that grew upon the surface of the bark. The food consisted of portions of boiled potatoe, or other victuals, purloined from the breakfast of the poultry. On many subsequent occasions they were observed disposing of their eatables in the same way. This was a characteristic of the squirrel to which I had never seen any reference.

I had frequently found myself called upon to defend my sprightly acquaintance from the charge of stealing and sucking the eggs of game and other birds; and sometimes I felt as though my pleading had been vain. One day when I was roused from my labours in the flower garden by an unusual noise of alarm among the poultry in the adjoining wood, I peered over the wall, where I saw the larger of the squirrels running along the surface of the ground with his bushy tail at full stretch behind him. This attitude gave him very much the appearance of a miniature fox in full chase. He was making his way through the midst of the fowls apparently with an egg in his mouth. I own I was shocked for the moment, and awaited the result of his conduct with feelings of anxiety. Presently I saw him ascend the trunk of a fine silver fir tree in the wood, where he disappeared from view among the topmost branches. Before long I saw him again descend, and cross to the thorn

hedge which formed the boundary of the wood, separating it from an adjacent sheep walk. From this hedge he collected little patches of wool from the thorns where they had lodged when torn from the backs of "truant sheep" as they forced a way through the hedge in quest of "pastures new." Here was an unexpected and completely exculpatory solution of the egg difficulty. My active little four-footed neighbour was merely collecting materials for lining his nest, which I presently discovered almost at the top of the tree just mentioned. The nest was rapidly approaching completion, and in it a family of three squirrel cubs was reared without molestation. This seems to be the usual complement of a litter of squirrels; at any rate, every nest met with in my personal experience has held exactly that number. They who have seen kittens at play on a hearthrug, or lambkins gambolling in a meadow, have but a faint idea of the sprightly antics of young squirrels when first allowed to venture outside the curtilages of their domicile. They run races at almost incredible speed, and chase each other in a spiral direction round and round, or sometimes up and down, the stem and along the branches of neighbouring trees. They play at bo-peep after a most ludicrous fashion, and their changes of attitude are effected with amazing agility. They are quick-tempered, even irritable, when engaged in such sportive exercises; and this characteristic does not disappear when the animals arrive at maturity.* Many a time has their passionate clucking, accompanied by a peculiar thud or patting sound made by the feet, betrayed their unsuspected presence. It would be difficult to explain exactly how this thud is produced. It is not like the stamp—stamp—made by the Herdwick ewe as she faces round in a threatening attitude to confront the collie when she is alarmed for the safety of her offspring. The sheep uses one fore foot only at a time. The rabbit stamps with his hind paws, as a note half of alarm, half of defiance, as he disappears head foremost into his burrow. But the squirrel apparently uses

* When Connie's offspring were fully grown, they were driven from the wood in which they had been reared, by the combined efforts of their parents, and we saw them no more.

all his feet simultaneously, or "stutts," as a Cumbrian would say. I have only now to add my conviction that the squirrel does not hibernate, as I had been taught almost from infancy to suppose; for even during the terrific snowstorm of March, 1881, and others scarcely less severe in the seasons immediately preceding it, their visits to my back door were never intermitted. Only when the hazel nuts were ripe and fairly abundant would they disappear for a few weeks at a time. In addition to nuts, and such other articles of diet as I have already enumerated, squirrels seem to have a liking for the kernels of most kinds of stone fruit. I have seen them busily engaged in stripping a plum tree of its half-ripened fruit, not for the sake of the outer pulp, which they stripped off and tossed away with a disdainful gesture, but in order to reach the seed imbedded within the central stone, through which they can drill holes with amazing rapidity. I am persuaded, also, from pretty close observation, extending over a series of years, that these agile, interesting, and harmless animals spend much more of their time on the ground than is commonly supposed.

Of the other Rodentia in a wild state, the Long-tailed Field Mouse is in some places greatly too abundant in meadows; and I regret to think that this mischief is being aggravated by the mistaken folly of game-watchers and preservers in their reckless persecution of owls, kestrels, and of other birds that formerly kept the Muridæ within reasonable limits. The Short-tailed Field Mouse is also increasing at a similar rate. Of late years I have noticed many meadows in which large patches of ground were quite ruined for haymaking purposes by the burrowing operations of mice and rats. Yet what a pretty creature is the Short-tailed Field Mouse, with his chestnut-coloured fur, short stumpy tail, and prominent bead-like eyes of glossy blackness. How such little animals manage to gain subsistence during very severe winters, I have never been able to determine with any amount of satisfaction. On the 29th May, 1881, I had rambled as far as the summit of Swarthfell, where, in an extensive hollow, the snow still lay deep in the centre. The outer edges of the drift had gradually melted away, and the surface thus recently exposed bore evident traces of

animal life passed under the snow, which had covered the space for many months. The whole area was scored with tracks, apparently of mice; and the fibrous roots of the heath were gnawed asunder in every direction. By what species this had been accomplished, puzzled me greatly; nor was the wonder diminished by the fact that the altitude of the place was fully 2000 feet above sea level.

Of Rats, both the common species and the Water Rat [Vole] are not unfrequent; the latter, however, confined to the edges of brooks and swampy spots. I have heard many a person who passed as an authority among his friends, maintain that the water-vole is destructive to fish, and that he is generally carnivorous. This is not so. Any angler may soon satisfy himself on that head. He has only carefully to observe one of these creatures in his usual haunts, to be convinced that he is a strict vegetarian, and moreover an Epicurean in his tastes, selecting only the freshest shoots of willows, and the sprouts of sedges, reeds, or canary grass. Should you attempt the introduction of any fresh plant, by transplanting the same within his beat, he is almost certain to pay it most annoying attention, by nibbling it through at the earliest opportunity. Several experiments of mine in this direction have been foiled by his pertinacity.

Of well known animals like the Hare and the Rabbit, no detailed remarks are called for. I will therefore pass them over by noting that within my recollection the Hare has steadily and sensibly decreased in numbers; while the Rabbit has increased everywhere, and is now in some districts so abundant as to be a formidable nuisance to the agriculturist.

Persecuted as the Mole is in many quarters, he yet appears to retain his ground; and I imagine that the farmer's absurd prejudices against the "mowdie-warp" are less virulent than they once were. Professional molecatchers are yet in our midst, though perhaps their popularity has diminished since the close of last century, when Messrs. Bailey and Culley, in their Report on the Agriculture of Cumberland and Westmorland, found only two things whereon to compliment our farmers, to wit—the use of light single-horse

carts, and the means in use among them for the extirpation of moles.

Of the Deer family, the only wild representative now to be found is the Red Deer of Martindale Forest, on the Westmorland side of Ullswater. Their number is not now very large. Stray specimens occasionally fall under the observation of the mountain rambler. Time was when the Martindale and Heltondale farmers complained of damage to their crops by his nocturnal irruptions into the enclosures down in the valleys. "It is not merely what these bucks consume by *eating*, but what they *waste*," said a dalesman to me many years ago. "Gripping a lot of stalks in their mouths, they strip them in this fashion," (making an upward motion with his hand by way of illustration,) "and so lots of our finest corn is lost." As grain cultivation is mostly abandoned, and the number of deer much lessened, there is now less ground for complaint. That fine animals still remain is evidenced by the fact that the late Sir Richard Musgrave succeeded a few years ago, while deer-stalking in Martindale Forest, in bringing down a splendid stag, the head and antlers of which are preserved at Edenhall. A few head of Red Deer are also to be found on the fells of Gowbarrow, but within the limits of the enclosed park of Lyulph's Tower. They confine themselves as a rule to the very crest of the hills, and hold themselves aloof from the society of the Fallow Deer, which graze for the most part along the southern slopes of the hills fronting towards Ullswater.

The hill Fox still maintains his footing, and but for the effective means adopted for keeping down his numbers, would soon become a pest to the shepherds. In the olden time a price was set upon his head, and every person who succeeded in capturing a fox was entitled to head-money, varying in amount in different localities. The bailiff of the manor or the churchwarden of the parish, and in some instances both these officials, were called upon to contribute their stipulated quota. It was no unusual thing for the captor, in claiming his dues, to bring his prize—whether Fox, Marten, Fomart, Weasel, or feathered bird of prey, as Raven, Falcon, Hawk, &c.—and suspend the carcass from the boughs of

the churchyard yew, or even in the church porch. They who have never taken part in a fox-chase as conducted on the hills, can but faintly realise the excitement, fatigue, and danger to life and limb incurred by the hardy pedestrian during the headlong pursuit, especially when gill and crag are alike hidden from view by drifted snow-wreaths. While rearing her cubs, the vixen and her brood are capable of effecting a serious amount of mischief in a few hours. I well remember an instance where a yeoman, in whose family I lodged from 1840 to 1851, sustained great loss in this way. About midsummer my host had his flock of geese, numbering from twenty to thirty birds, old and young, in an enclosure close to the farm buildings. One morning the field was found strewn with the mangled remains of the birds. All had perished save the old gander, which was discovered stupified with terror in the farm yard, and one of the geese which had managed to escape by sacrificing her tail. There had evidently been a grand foray or worrying practice. The head, neck, and breasts of most of the birds were gone, and these were in some instances found buried in the footprints of cows, and other accidental depressions in the surface, some of the former having been enlarged for the purpose.

Of the *MUSTELIDÆ*, or Weasel family, all the species commonly considered as indigenous in the northern counties of England are represented in the hill country. The Common Weasel is the most frequently met with. The entire tribe are noted as being blood-thirsty and rapacious—destructive to poultry, game, and small birds indiscriminately, great numbers falling victims to their predatory habits. As they commonly reject the bulk of the body of their victims, sucking the warm life's-blood from the veins of the neck, and scooping out the brain, they often work mischief out of all proportion to their size and apparent capability. Their murderous character makes them an object of bitter dislike to gamekeepers and poultry fanciers.

The Ermine or Stoat assumes a garb of pure white during winter, except the tip of the tail, which is of glossy blackness. When resuming their summer attire, they are frequently to be met

with in a curiously speckled or particoloured dress. They are very pugnacious creatures, and will fight with great resolution to the last gasp. I recollect seeing one which had its spine injured by a stone aimed at it by a plough-boy, drag itself along upon its forelegs only, and spring at the lad, seize him by the leg, and quit its hold only when choked by the lad's firm grasp of its throat.

The Polecat or Fomart is a very destructive marauder, and is frequently hunted by dogs trained to the sport. He is, however, more commonly met with in the lower parts of the country than in the mountains, where his place is taken by the Marten, or Sweet-mart, as he is designated, to distinguish him from his mal-odorous kinsman. This last animal is much larger than those already referred to. The huntsman of the Ullswater hounds told me that he had not long ago seen one killed, which weighed as much as four-and-a-half pounds; and I have seen a stuffed specimen at Lyulph's Tower, of the same large proportions. Mart-hunting is keenly enjoyed by the dalesmen. When hardly run, he will take refuge in a tree, or, if on the open fell, as more generally happens, he will seek shelter in some heap of boulders, or hole in the rocks. From such "biolds" he is frequently dislodged by kindling a fire to windward of his hiding place. As soon as the smoke reaches him, he bolts. This manœuvre he will repeat until he is completely exhausted. The chase frequently leads over very rough and precipitous ground, and is attended with risk to the limbs and even life of its votaries. Smoking-out has been attempted with the fox under similar circumstances; but it is a hopeless failure when applied to reynard. The number of Marts is gradually becoming less,

The Badger has for many years been regarded as extinct in Cumberland. Quite recently, however, "brock" has reappeared amongst us; stray specimens continue to be reported from different quarters; and I hope it may ere long be regarded as fully re-established. The number of places still known as "Brockholes," &c., sufficiently attest its former abundance. I remember a venerable acquaintance of my youthful days describing the process of brock-

catching about a century ago. The village lads of Lowther and Melkinthorp used to go to their haunts provided with empty sacks, the mouths of which were kept open by wooden hoops. The sack's mouth so extended was placed over the entrance to the burrow, and steadied between the knees of the holder, means being at the same time adopted to drive the badger from his lair. The dread of a bite from the animal's formidable jaws was so great, that my informant's knees "dadder'd" against the rim of the sack. It is sad to think that all this ingenuity was exerted for the cruel purpose of baiting the animals so captured. During the summer of 1885, John Greenhow, the gamekeeper at Gowbarrow Lodge, informed me that a solitary badger had taken up his quarters among the rocks on the adjoining fell. After an unmo-
 lested sojourn of several months, the animal had not long ago disappeared. The *West Cumberland Times* of May 8th, 1886, records the capture of a badger and a marten on the preceding Monday by the Blencathra hounds, in the vale of Naddle, St. John's, Keswick. It is quite possible that the wandering "Brock" thus sacrificed, was the same animal that had temporarily sojourned on Gowbarrow Fell, as recorded by Greenhow. The distance from the latter place to Naddle is about six miles.

The Hedgehog is another animal which has been the victim of much absurd prejudice and superstitious ignorance. The idea of his sucking the teats of recumbent cows may be considered as exploded. The charge also of being destructive to young and helpless fledglings, I consider to be grievously exaggerated. Frequently as I have seen the animal questing for supplies, it has been on some moss-covered bank or hedgerow, where, sniffing as he went, and boring with his snout like a pig, you might hear a low grunt of satisfaction as he unearthed some tiny snail or chrysalis, which you could plainly hear him crunching between his jaws the next moment. The Urchin is extremely pugnacious in his temper. When bustard fishing one time in the Roe, I was surprised by hearing piercing squeals of distress among the grass of the meadow behind me. On quietly reconnoitring the ground whence the sound proceeded, I discovered two hedgehogs in

deadly conflict. One of the combatants had seized the other by a hind leg, to which he clung with the ferocious tenacity of a bulldog, despite the agonised screams of the sufferer. Only by severe pressure upon his throat with the butt end of my rod could I succeed in making him relax his hold. On another angling excursion, in the neighbourhood of Cockbridge on the Ellen, I discovered an urchin's nest, evidently of recent construction. Externally the material used was the last year's leaves and stems of *Carex paludosa*, which must have been bitten off by the animal and carried about two hundred yards, from the very opposite end of the meadow, where a large patch of ground was covered by the sedge referred to. On opening the nest, I was surprised to discover the mother urchin in the very act of parturition. What funny looking little things the infant hedgehogs are! The skins are of deep pinky red, having only the rudiments of prickles perceptible in fine silky hairs of snowy whiteness. Carefully replacing the covering of the nest, I took my leave of "the lady in the straw."

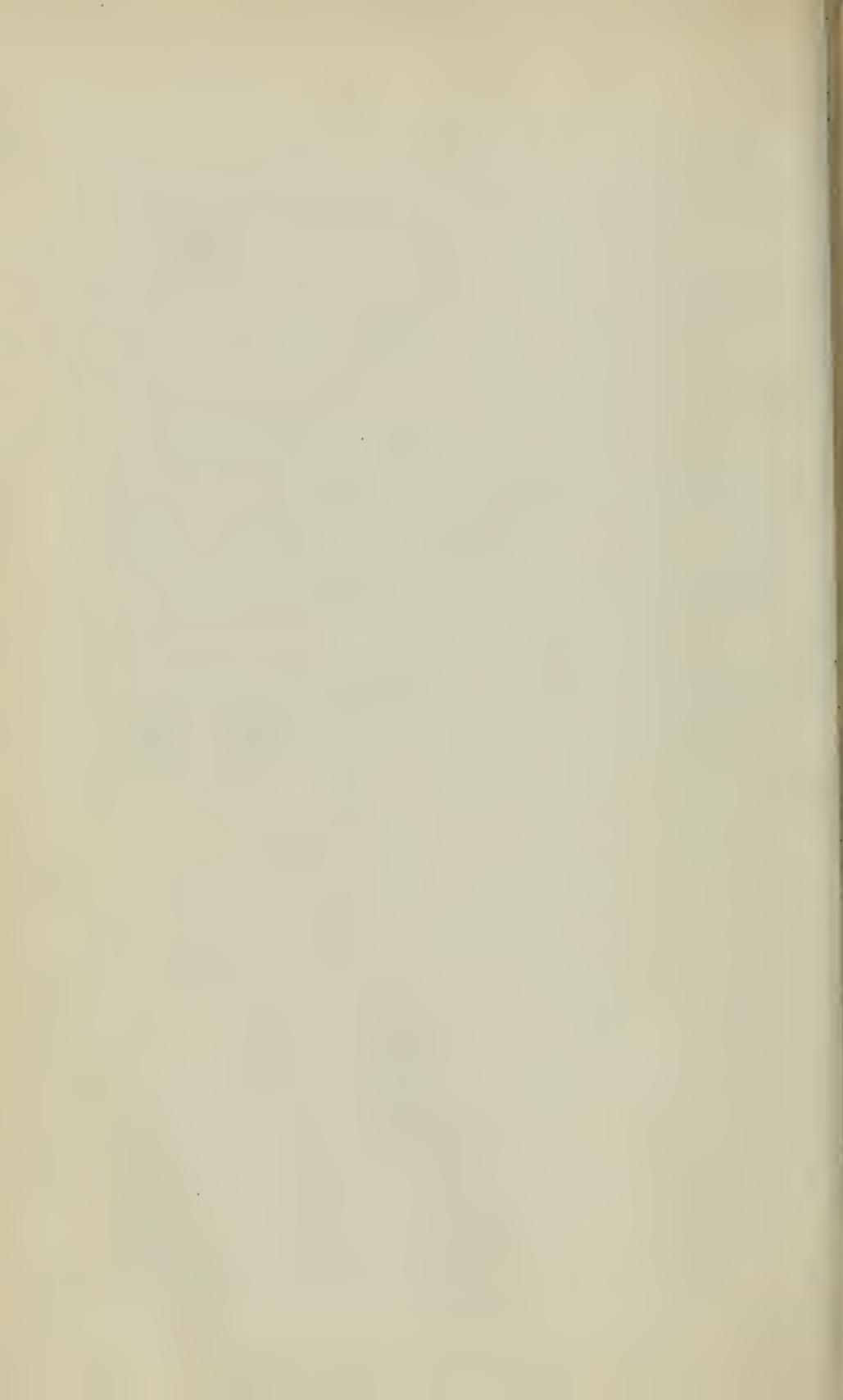
While sojourning among the fells, I have come upon few traces of the Otter. Though the animal is met with in the Lakes, I never saw a living specimen in any of the mountain tributaries of Ullswater, or in any other of the lakes which I have visited. I conclude, therefore, that he prefers the lower- and less-impetuously running reaches of the rivers of Cumberland.

The Shrews, in common with the Hedgehog and other animals, have in bygone days been the objects of aversion and active persecution from the vulgar, owing to the baneful properties attributed to them by superstitious ignorance. They were supposed by our rustic forefathers to paralyse the limbs of cattle by merely creeping over them; and their bite was held to be venomous, if not incurable. Whether these extraordinary fallacies took their origin from the fact that cats, though they kill the shrew indiscriminately with the domestic mouse, leave the carcasses of the former untasted, I cannot affirm. Of the Common Shrew it is not my purpose to make any remarks; but I am anxious to state a few facts that have come under my personal notice with regard to the Water Shrew, *Sorex fodiens*, respecting which much doubt seems

to exist. Not long since I saw it stated in a local print, by a Natural History contributor, that this most elegant and interesting little creature was of a chestnut (!) colour. Mr. W. Kinsey Dover, in an appendix to the latest issue of *Fenkinson's Guide to the Lake District*, mentions the Water Shrew as *scarce*. My experience tends in quite a contrary direction; for whether stationed at Aspatria, Frizington, or Watermillock, during the last fifty years, I have ever found them in respectable numbers. True it is that their haunts lie out of the way of ordinary observers, and hence possibly misconception has arisen. They are entirely aquatic in their habits, and in drougthy seasons, such as those of 1859 and 1868, suffered severely from the drying up of little rills or water-brooks. Instead of being rufous or chestnut coloured, their fur is of the glossiest black above and white beneath, the colours being abruptly separated; the under surface of the tail is fringed with stiff white hairs. Their motions, whether on land or in water, are elegant and inconceivably rapid. They swim and dive with the utmost dexterity. During the summer of 1842, I had almost daily evidence of their extraordinary evolutions in an artificial pond which was formed by damming up a little brook that flowed through my garden. Here a brood of five in number, accompanied by their parents, used to disport themselves with unmistakeable delight. When the sun shone out brightly, their glossy submerged coats glistened like frosted silver—arising, I am informed, from the innumerable bubbles of air that cover their velvety coats. Their watery gambols strikingly reminded the spectator of those of a brood of ducklings at play. Nor is their gamesomeness confined to the water. In 1876, while botanising on the Frizington Parks estate, I was an interested spectator of their frolics on terra firma. Here again the family consisted of five members, exclusive of the parents. At the termination of a drain, where it emptied into an open water-course, was the entrance to their burrow. The field was in grass at the time, and depastured with cattle. In a semi-circle round their hole were a number of grass-covered runs, artistically arranged with the view apparently of forming a first-class recreation ground. A number of paths, wide enough only to

accommodate a single shrew, radiated from the burrow as a centre, each extending about seven or eight feet in length. These were crossed by parallel semicircular tracks about a foot apart, the entire ground plan giving much the idea of a geometric spider's web cut in half. Along these tracks, lengthwise and crosswise indiscriminately, the youngsters chased each other with almost lightning speed. Should any two of their number chance to "foreset" each other, there was a squabble, and much shrill recrimination resulted. When tired with racing along, they would suddenly scuttle into the burrow, only to return in a few minutes and renew their frantic exertions. Their speed was so great, that although I sat within reach of the inner line of tracks, I failed to capture any of their number, and was obliged to give up the attempt. Shrews feed on worms, grubs, caterpillars, etc.; and the bill of fare of the Water Shrew doubtless includes aquatic insects, such as the larvæ of the ephemera, etc.

I must here conclude my remarks for the present. I had purposed to include the Bats, etc., of the district in my Notes, but my information is hardly sufficiently accurate to warrant my prosecution of that intention at present.



LOCAL SUPERSTITIONS.

BY W. JARDINE.

(Read at Longtown.)

A GREAT deal of our early information, and more especially that concerning the manners and customs of life, is traditional. Also, notwithstanding that man is endowed with brilliant reasoning faculties; notwithstanding that the present age is one of progress; it is wonderful how much imitation there is in the manners and customs of everyday life. Hence we do certain things, and these in certain ways, simply because they have been so done by our forefathers; also, for the same reason, we believe certain things. Superstitions may in a certain sense be said to be hereditary: they are handed down from generation to generation. They are local to this extent—that in certain forms they may be peculiar to certain districts; also the interpretations put upon the same superstition may vary in different localities. It is chiefly, however, in country districts that they are most prevalent; and, although we are slowly outliving them, our own neighbourhood is rich in superstitions.

Let us notice a few reasons why superstitions are believed in. (1) Because forecasts are vague, and interpretations may be traced somehow in the chances of life. (2) The penalty of ill omens is so dreaded, that the credulous shrink from putting them to the test. (3) There are nervous cures, and love-charms, and dreams, in which anxious consciousness points right—the wish being father to the thought. (4) Victims of superstition are secretly pleased

when (by chance) an unlucky omen comes true, and have a satisfaction even in relating their misfortunes ; while, since no one tells of the cases that *do not* come true, every chance of fulfilment is a new rivet in the chain that ought long ago to have fallen to pieces.

There is a sort of sacredness about them which renders people afraid of putting them to the test ; but if they were fairly tried, they would be detected as a mental tyranny, a popular fraud ; and in a few generations would be remembered by the rustic classes only, as the learned now remember the foolish excitement of their forefathers in science, seeking the Elixir of Life and the Philosopher's Stone.

Most superstitions are signs of ill-luck, hence the unlucky greatly predominate over the lucky omens. When going away, it is considered very unlucky to meet a woman first. A farmer in our own neighbourhood tells me that his father was once going from Rosetrees to Drybeck to a cock-fighting contest. When nearing the latter place, he met an unlucky person—which simply means a person who had been the victim of bad luck *some* time. His first impulse was to climb the hedge, and so avoid passing this man on the road ; but on second consideration he went on. The result of this unlucky meeting was the best possible luck : for he was the champion of the day, his bird being victorious in eight contests, and he finally bearing off the head prize, a pair of shoes. It would seem there was a possibility of defeating bad luck and wooing good ; for it was very common of people when going away, in order to avoid a woman or a person accredited unlucky, to send out a man to meet them first. It is also considered unlucky for a woman first to enter a house on a Christmas or a New Year's morning. Why, I don't know ; but I know a man, who, last Christmas, was absolutely forced to go into a certain house on the plea that the goodwife would not like to see a woman enter first. Nor was this enough ; he was pressed to take some spirits, but being a teetotaler, had to eat a piece of bread before coming out.

It is a common saying that as much as possible ought to be carried into a house on the first day of the year ; but nothing

ought to be carried out. I think, however, the practice of rising early on that morning, to carry into the house sticks, coals, etc., is obsolete; as is also the great provision that used to be made by the old people for that day, by emptying their dirty water, throwing out the ashes, and completing multifarious other household duties on the New Year's Eve.

Then what a halo of bad luck seems to surround Friday! It is the day, of all others, upon which nothing important should be done. It is unlucky to marry on that day; and in England, at least, hardly anybody would like to get married on that day. I know a couple who married on a Friday, and though it was said their marriage would prove unlucky, they have lived happily together about forty years. Of course everybody knows the ill-luck believed to attach to flitting on a Friday. "Friday flit, short sit," is a saying which, though perhaps not so much heeded now-a-days, has, nevertheless, a good many champions. You will find very few servants out of our own district go to their places on that day; and I know farmers who are very unwilling to commence sowing corn on that day. Why is this? Perhaps this is the reason: Friday was the day of our Lord's crucifixion, and is, therefore, a fast day in the Roman Catholic church. Popular superstition soon marked it as an unlucky day, and this idea has survived long after the original reason which brought the day into disfavour has been neglected or forgotten. In Scotland, so strong was the antipathy to Roman Catholicism, that it actually divested poor Friday of its character of "unluckiness," and that day is now in Scotland a great day for weddings.

The present age, however, is apt to deal a little roughly with the beliefs of its predecessors, and a modern Englishman who found that it would suit his convenience to get married on a Friday, would hardly be diverted from his purpose if he were told that on that day Adam and Eve ate the forbidden fruit, or that Adam died on a Friday. To shew the extent to which the belief in the un-luck of Friday is carried, I might tell that a young man, a friend of my own, visited his aunt, a maiden lady who keeps a cow, about six weeks ago. He suggested the necessity of trimming the cow's

tail, which was too long, and was just about to do it for her, when she interposed with, "No, no, I won't have it done to-day; *this is Friday, and it would not be lucky!*"

Did you ever know that it was extremely unlucky to sweep the house before going away anywhere? How we came to recognise such a superstition as this, it would be difficult to find out; but one can imagine its having been handed down to posterity by some housewife who invented the unluckiness said to follow the event to excuse her own laziness.

Then how should the event of a timid hare crossing our path interfere with our luck? Yet the angler coming home with a light creel and a heavy step, invariably construes the above accident into the cause of such.

Then you know the rhyme of the magpies:—

One's sorrow, two's mirth,
Three's a wedding, four's death,
Five's heaven, six's hell,
And seven is the deil's ainsel'.

It is amusing to think how easily sorrow could be changed to mirth. Why should not the appearance of as many sparrows presage similar things? and why should superstition cling to these birds?

The Cuckoo visits us in spring. But it is said the year will be an unlucky one to us if, when for the first time in the season we hear his melodious cry, we do not have money in our pocket.

The belief—very strong in our neighbourhood at one time—that if it rained on St. Swithin's Day, it would rain for six weeks, has long ago exploded, and reference need only be made to it.

That a child should never see its own shadow in the looking-glass before it is a year old, is a well known-superstition. Many a time have I seen a servant girl scolded for having recourse to this method of pacifying a noisy child. For the same length of time the hands must not be washed.

When going away, it is unlucky to have to turn back for anything. I suggest that this may have its origin in this: Lot's wife turned, and was changed into a pillar of salt.

Salt is considered a very lucky thing. Many people when removing to a new house make a point of carrying salt and meal in first. To spill salt at any time is very unlucky. "A pound of salt (spilt brings) a peck of sorrow." In some places it is believed to predestine a shipwreck.

It is a common saying, that "It is better to be born lucky than rich." We hear a great deal in these democratic times about the persons born with silver spoons in their mouths. If it is only our lot to be born on a lucky day, we would seem to be better off than they. Two old rhymes on birthdays I have found. The first, a Scotch version, runs :—

Monday's bairn is fair of face ;
 Tuesday's bairn is full of grace ;
 Wednesday's bairn is a child of woe ;
 Thursday's bairn has far to go ;
 Saturday's bairn works hard for a living ;
 But the bairn that is born on the Sabbath day,
 Is lively and bonnie, blithe and gay.

Contrast this with the English version :—

Born of a Monday, fair in face ;
 Born of a Tuesday, full of God's grace ;
 Born of a Wednesday, merry and glad ;
 Born of a Thursday, sour and sad ;
 Born of a Saturday, work for your living ;
 Born of a Sunday, never shall we want—
 So there ends the week, and there's an end on't.

Any country girl would trust it true if she were born on a Monday ; and who that came on a Tuesday would confess himself "graceless"! But about Wednesday's bairn there seems to be a difference of opinion among the prophets : one rhyme predicts "a child of woe," whilst the other says "merry and glad ;" and thereby, from self-contradiction, the old rhyme goes down like a house of cards. Ye we should not forget that what we read opposite our names in our birthday text-books, and joke over, is similar to, and perhaps the outcome of, what was looked on a few years hence as a solemn reality.

A great many incidents indicate the coming of strangers or friends. If the cock crows near the door, it is a sure sign that a stranger is coming. A stranger may mean almost anybody; and if that stranger comes on the same day that the cock crew, or on the next, or even on the third day, the crowing of the cock, all the same, foretold it! I know a good many people who have almost implicit faith in this. If a stranger happens to come once when one is expected, the reputation of the cock that foretold the event is established; thereafter he is known as a "true cock."

A piece of soot blowing backwards and forwards on the bar of the grate betokened the coming of a stranger. The hands were clapped in front of it; and if it was blown into the fire he was coming in, if it fell below the grate, he was going by.

Who has not seen a spark in the wick of the candle? It is believed to foretell the coming of a letter to the person who sees it first. It is beautifully described by J. J. Lonsdale, one of our Cumberland poets. The words are put into the mouth of a girl:—

"Here's a letter from Robin, father,
A letter from over the sea;
I was sure that the spark i' the wick last night
Meant there was one for me;
And I laughed to see the postman's face
Look in at the dairy park,
For you said it was so woman-like,
To put my trust in a spark."

These last two superstitions are very transparent, which, doubtless, has a great deal to do with our hearing so little about them in these matter-of-fact times.

As "every cloud has a silver lining," so the omens of ill-luck are counterbalanced by those of good. It is considered very lucky to find anything, but particularly coins or pieces of metal containing holes. A story was told me of two brothers who left this district to seek their fortune in one of the larger centres of industry. One of them found a piece of old horse shoe. One has been very successful in business, and has prospered well in life: this is the one who found the horse shoe. It is firmly believed by his

parents, and by a great many who knew him, that his good fortune was the result of his finding the horse shoe. You all know how holed coins are treasured ;—and I am of opinion that the practice of hanging holed coins to our watch-chains can be traced to superstition. Any person who has visited Breckonhill Tower, Longtown, cannot have failed to have seen horse-shoes, circular-shaped, nailed behind each door. I once asked the reason for this. “ Ah,” was the answer given, “ it is for luck. Mr. Standish (the owner) is a queer ‘man.” I here trace this to the fairies. Persons also spit on money for luck : the absurdity of the custom being excelled only by its untidiness.

An old lady in Longtown told me that if any person makes their “honours” to the new moon the first time they see it, they are sure to get a present before it goes away. My informant further stated that her sister once did this, and she got a pair of gloves before the moon went away.

There is an old superstition still believed by many, that to ensure good fortune during the year, some part of a person’s dress must be new on Easter-day ; it is also believed by some that if this condition be not complied with, the birds are likely to spoil one’s clothes. Perhaps this is why so many ladies insist on having the prescribed new bonnet on Easter, since the proverb says :—

At Easter let your clothes be new,
Or else be sure you will it rue.

Hundreds of other little incidents are believed to be fraught with solemn warning. If your nose itches or your ear rings, it is a sign of death ; if your right ear burns, some person is praising you, and if your left burns, they are speaking lightly of you ; if your foot itches, you are going to travel on strange ground ; and if your hand itches, you are going to get money.

When the butter was long in coming, the churn was believed to be witched, and the housewife used to throw some salt into the fire, and put a little in the churn, to “buy over” or “frighten” the witches. Sometimes before the churning the pitchers containing the cream were carried to the edge of a running water and back

again, before the cream was put into the churn. A person informs me that this was frequently done at Mossband.

Another very common practice in our own neighbourhood was for people to sprinkle salt on a cow's back after she had calved, to keep away the witches; also it was very common to give the young calf an egg. A person I know well, had no belief in the custom. On one occasion most of the household had gone to market, and instructions were left with the person referred to, that when the cow calved he had to give an egg to the calf. The cow calved; but instead of following the instructions of his mother, he ate the egg himself; and yet, he said, the calf seemed none the worse for want of the egg. This was literally "swallowing" superstition.

Lucky stones all must have seen. Few stables are without them; and they are considered a sort of general charm against the combined powers of fairies and witches, and also disease.

Charms for the cure of warts are to be found all over the country. The following are sometimes used in the immediate district:—"Cut an apple in two. Eat one half, and rub the warts with the other; then throw it away, and the apple and the warts will decay together." "Get as many little stones as there are warts on your hands, and put them into a bag. Turn your back to a hedge, shut your eyes, repeat certain words, then throw the bagful of stones over your shoulder." It is important that the person trying this charm should not go back to the place where the bag is lying, to look at it. I remember trying this cure myself, and believing in its efficacy at the time, as my warts all disappeared save one.

For whooping cough there are many cures. The following curious one was resorted to in Longtown only a few weeks ago. Two children in English-street had the whooping cough. A pedlar who happened to call heard the children cough, and advised the mother to pass the children three times under a she ass. This was done, the children were cured, and the ass got the credit.

Rheumatism is another ailment that yields to charms. An old man living in the neighbourhood of Westlinton was much troubled

with this painful disease. He hung a holed stone to the bed post, and so long as it remained there he was comparatively well. But his sister removed the stone, and his pains returned.

The district is rich in names tracing the belief in fairies; and many old people I have come in contact with still believe in their existence. One person who lives in the neighbourhood tells me it was once his bad fortune just to miss the sight of one. When he was a boy going to school at Mossband, a fairy happened to be passing the school. There was a general rush to get a glimpse of the creature; and as he was too small to fight his way to the front, it got past before he could see it.

Fairies are things of the past; but not so the witches. They played no small part in the affairs of our immediate forefathers. They were consulted and believed in so late as 1817. Their favour was courted by almost everyone; in fact, it was considered dangerous to offend them. Just a story or two to illustrate the remarkable powers supposed to be possessed by "Branton Lizzie." On one occasion a bale of cloth was stolen from a cottage on the side of the Lyne, near Breckonhill. Lizzie was consulted, and probably the names of the suspected persons were mentioned to her. On being asked who had committed the theft, she declared she knew, but would not tell. She, however, said the cloth would be returned within a certain time, and in the meantime the guilty persons would be "witched." It was said that the cloth was returned within the prescribed time, being put through a pane of the window into the house; and that—to use a rustic phrase—some persons were "severely handled" in the interval between the loss and the return of the cloth. A man who lived at Low Hallburn is said to have got out of bed and to have run along the ceiling and rafters of the house, to have set up unearthly cries, and to have baffled the efforts of many men to keep him in bed. Lizzie was applied to in the emergency. She told the applicants they must go to a certain place, and there shoot a hare, and the man would get better. They went to the place indicated, and a hare rose up at the very place—but no, it could not be shot. It was, in fact, a "witched hare."

That Netherby is believed to be haunted, we all know. I need not tell you of Lady Widdrington's ghost at Warren Burn ; about the turning of the pictures nightly on the walls at Netherby, and the curious sounds heard. Nor will time permit me to introduce you to the white woman who used to be seen near the Fauld, or her cousin who terrorised the inmates of the Hallburn Workhouse some years ago by her nocturnal perambulations. Nor need I point out to you that at certain places certain kinds of boggles were seen ; and that hardly any road was without its apparition.

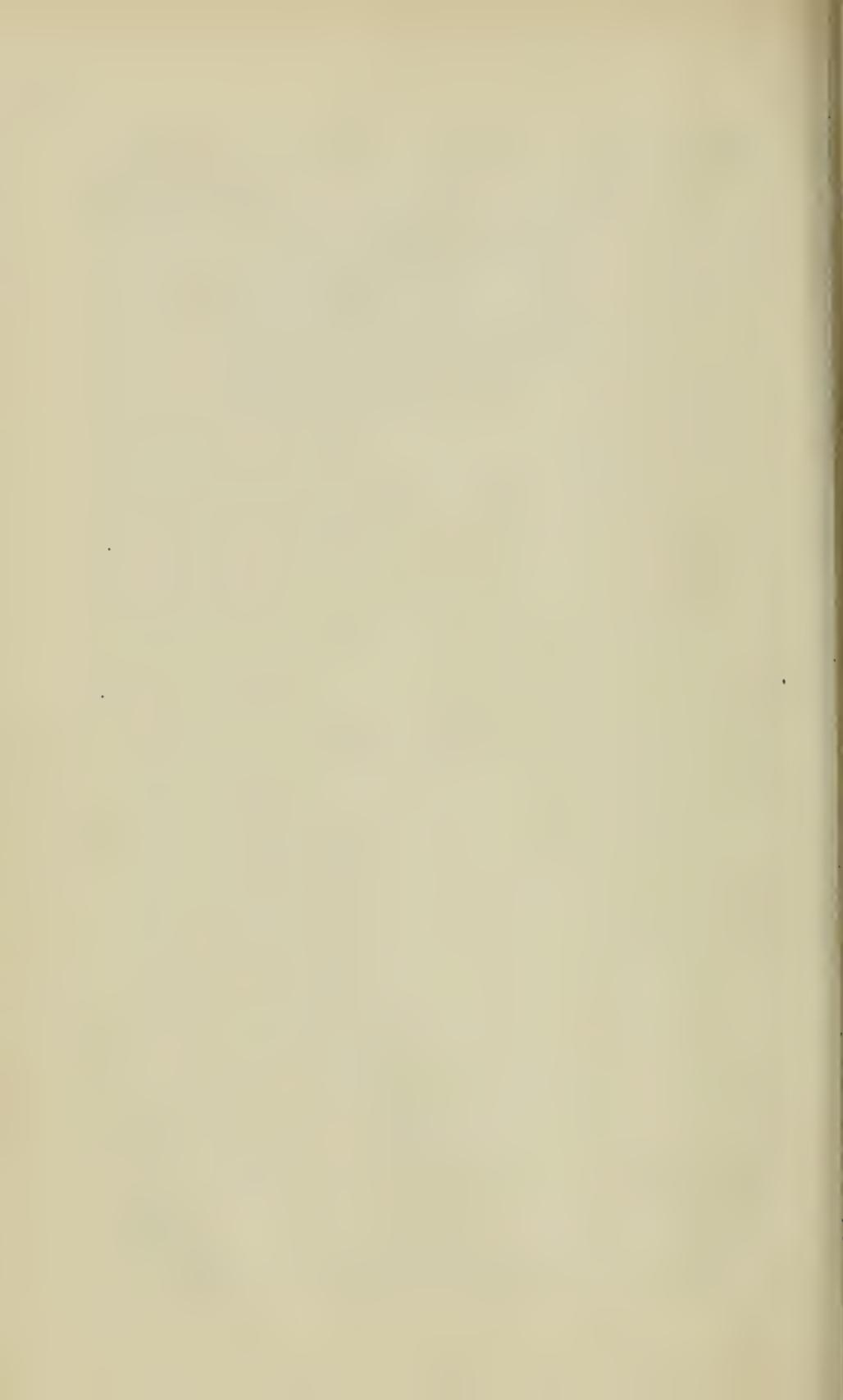
There might be an excuse for those who put such faith in witches ; but we can hardly sympathise for a moment with those who take the "Belfast Almanack" for their prophet and friend in weather matters. An old farmer, yet living, once invested in a Belfast penny almanack. He, however, did not find it so trustworthy as he expected, and one day he exclaimed, "That penny almanack tells nowt but lees ! The furst time I gan ta Carel I'se gan ta git a sixpenny 'en : it'll tell the truth, an' last a few years !"

The belief in dead lights is not itself quite dead. The general belief was, that on the death of any person, his spirit, in the form of a flame, passed along the "burial road" to the church, up to the place where the coffin would rest, and thence to the grave. Once near Wisk the horse drawing a hearse stopped in the road, and refused, in spite of blows or kind treatment, to go on. Then some one told of his having, when on this particular horse, met the dead light, and about its passing between the legs of the horse. The coffin had to be taken out of the hearse, put through below the horse the way the light had gone, replaced in the hearse, and then the horse went quietly on as before.

There is a border superstition relating to baptism, which is not common in our own neighbourhood. Mr. Bulkeley, of Lanercost, tells that a south-country clergyman was doing duty for a friend near the border, and was about to baptize a family of children, taking up the youngest first, when he was stopped by an old woman plucking his surplice, and crying out, "Ye mauna christen a lass afore a lad !" All present joined in the protest, and he yielded to them, but asked the reason : "Why, he'll hae nae whiskers !" In

east Cumberland it is further believed, that the lass will get the whiskers the lad ought to have had.

“Gone those days of mental darkness ;
Men have outlived superstition ;
They have learned to trust to nothing
But what bears the name of wisdom,—
And confess no other power
Than the God of earth and heaven.”



OLD CUMBERLAND CUSTOMS.

By F. HARRISON.

(Read at Carlisle, December 22nd, 1885.)

IN the old customs, as in the ballads and poetry, can be traced the history of the people. In those old customs we see reflected much of the life of long past ages. I will place a few old customs before you, which, though in irregular order, and very imperfectly described, may call attention to some customs that are passing away. From the isolated position of this northern county, before the days of railways, many old customs lingered and remained which elsewhere would have long since passed away. Many of them showed that our ancestors knew how to enjoy life, and also that they sympathised one with another in times of sorrow and rejoiced together in times of joy and gladness.

The first custom I will draw your attention to is that of Boon Days, or given days, in Cumberland, when one man helped another in a new undertaking without fee or reward. Who has not heard of Cumberland ploughing days? From time immemorial it was customary, when a man entered on a new farm, for his neighbours to give him a day's service—and grand days they used to be in the olden time; and wherever the ploughing day is observed and carried out on the old lines, it is still a grand day. The same remark applies to clippings, house-warmings, clay-daubins, and other kindred institutions. I know a village not above one hundred miles from Carlisle, where many of the houses were erected in this way. When a man wanted to build, he did not

consult an architect, but consulted his neighbours, who were ever ready to render assistance ; got his clay mixed, and timber ready ; then, on some appointed day, his friends and neighbours gathered together and put a roof above his head before nightfall.

It is my opinion that more real pleasure was derived from social intercourse by our ancestors than now. In the old days the Church, no doubt, exercised a great influence over the people. Our fathers observed with great care the festivals and rites of the Church. A Christening used to be a much more important affair than what it is to-day, preparations going on for days and even weeks before the ceremony. They provided the best of eating and drinking, but this was never touched until the young hopeful returned from church. The good parish priest often returned with the party, and there were doings which would alarm many people in these degenerate days.

The same remarks apply to Marriages, which in old times were never concluded with residents over the Border. This custom of never intermarrying with the Scots was in vogue so late as the reign of Elizabeth. An old writer says, "No one should marry a Scotch woman, were she ever so honest." In fact, our forefathers were very jealous of foreigners of any description, and thus a clear distinction was kept between the English and Scotch races. The old freemen of Carlisle had some very severe regulations in that respect, and in those regulations they called everyone Scotchmen or foreigners who lived north of Blackford. All the weddings, even in the houses of the poorest, were occasions of great rejoicing and merry-making ; and it was nothing unusual for the wedding party to be tied into the church, the door being kept secure until such a sum was paid as kept every dry throat in the village moistened at the village ale-house for the remainder of the day. This practice still lingers in some remote dales, but elsewhere anyone pursuing it would soon be handed over to the police—which official, however, had no existence in the old times of which I speak.

In the old Funeral customs there are also traces of darker and more barbarous times. The hospitality of our ancestors often overcame their judgment, and funerals became scenes of feasting

and indulgence scarcely in keeping with the solemn rites of the burial of the dead. I can scarcely conceive a more curious practice than that of sending round the bell-man to announce a funeral something after this fashion :—“ All friends and neighbours are invited to attend the funeral of John Goulding, of the Mitre Inn. The friends will assemble at one, and the corpse will be lifted at two o'clock.” It dates from a bygone and primitive age. Yet such a custom as that, handed down from the darkest period of our history, I have seen observed in the streets of Carlisle far on in this the nineteenth century. The tolling of the church bells is still in vogue in most of the churches. The bells, which are tolled nine times for a man, six for a woman, and three times for a child, were at one time believed to frighten away any evil spirits that might be lingering about the dead. The funeral customs of Cumberland, if entirely collected, would form a work of much interest and value.

The origin of how the dates of the old Fairs in this county came to be fixed is lost in the mists of antiquity ; but it is probable that they were fixed by means of the Church festivals ; for it puzzles me to know how some old-fashioned people recollected the times of holding all those fairs on the proper dates before the days of almanacs.

The great festival of Easter appears to have been observed with great respect in Cumberland, and no changes in our social condition have succeeded in removing from it that halo with which it is surrounded. At Hayton, near Brampton, the lessee of the tithes gave twenty-four quarts of ale—which were always drunk in the churchyard—as a sort of receipt. The catechism was also gone through in country churches on Easter Sunday.

The first charter for holding a Fair in Carlisle, granted as far back as in the reign of Henry II., being confirmed by Edward III., was to last sixteen days, commencing on the “Feast of the Assumption of the Blessed Virgin Mary.” There is also another fair in this ancient city of great antiquity, and that is the Hiring Fair. The hiring fairs of Cumberland are curious spectacles to south-country folks. They are, however, institutions which will

soon be swept away before the advancing tide of nineteenth century civilisation. It was a usual practice for those wanting engagements in farm service to "stand the market" with a straw either stuck in their hats or in their mouths,—the straw, no doubt, being a symbol of agriculture. Anderson, the Cumberland bard, put these lines into the mouth of one of his worthies :—

At Carel I stuid wid a strea i' my mouth,
An' they tuik me, nea doubt, for a promisin' youth.

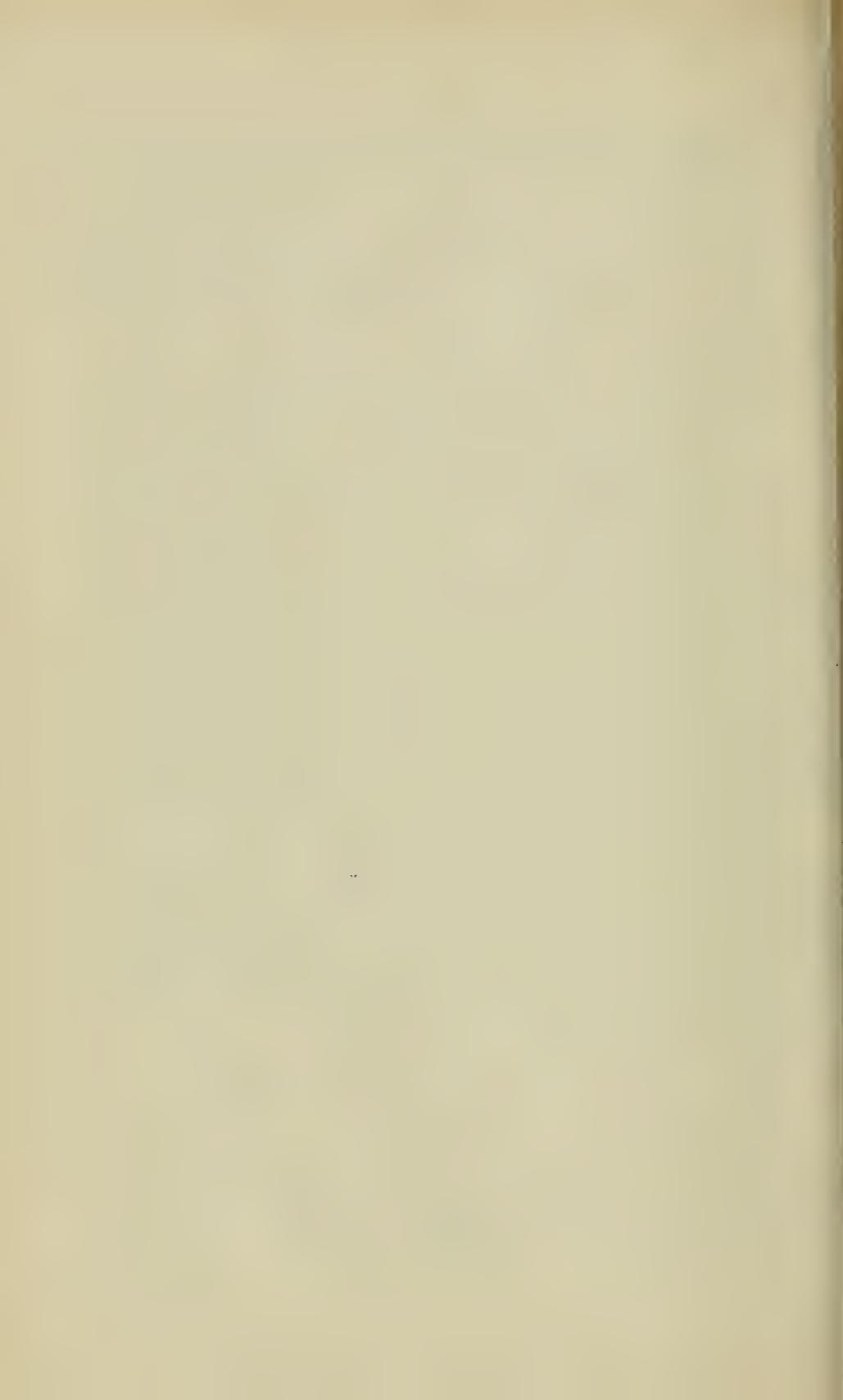
The modern rustic is far too refined to do that. The custom of exposing a straw has now nearly, if not entirely, passed away.

In the olden time almost every village had some annual gathering or merry-making almost peculiar to itself. The famous "Bleckell Murry-Neet" was known far and near. Almost every little village had its tansy about Christmas time, which were occasions of great mirth. Mr. G. Coward has supplied me with some interesting details in connection with the Melmerby Round, a great gathering which has now ceased to have existence. Melmerby folk to this day are pastoral in occupation, intercourse, and habits, and on Melmerby Green—one of the finest in England—they used to have great sport in the early part of this century. On Old Midsummer Day, the 5th of July, this village commenced its annual two-days' sports, which consisted of wrestling, leaping, foot-racing, dog-trailing, and a cock-fight now and then by way of variety. As many as four-score have contended for the wrestling prize at Melmerby Round, which was invariably attended by a large concourse of spectators. Being held at a season of the year when the days were longest and when the country wore its prettiest aspect, the old Cumberland sport was, probably, never seen under more favourable circumstances than at these sports a hundred years ago. Langwathby also had its Round, which was continued down to as late as the year 1870. The history of Langwathby Round, like that of the village itself, is lost in the dim mists of antiquity. The list of champions contains the names of some remarkable men, amongst them that of John Holme, king of Mar-dale, who won the wrestling in the year 1824. In 1826 it was

won by John Boustead of Beckbank, brother to the famous Bishop of Lichfield. Unlike Melmerby Round, that at Langwathby was held in mid-winter, on New Year's Day and the day following, and amongst the other attractions of wrestling, racing, dog-trails, etc., there was a dance on the green for maidens, sometimes in the snow. At the conclusion each maiden was presented with a bright ribbon, called a Fancy.

“Barring out” is an old custom which has gone, I am afraid, never to return. I have a clear recollection of the merriment of a barring out. About Christmas time, in most Cumberland villages, the scholars got inside the school early in the morning, and barred the master out until he had made arrangements as to length of holidays, etc. The master, who always expected the barring out at the proper time, used to adjourn to the village ale-house and treat the biggest boys to mulled ale—for in the winter season plenty of big fellows eighteen and twenty years of age attended the schools. The School Board system and the recent Education Acts gave, however, the death-blow to this time-honoured custom.

The customs of this county regarding Christmas Hospitality cannot be excelled anywhere. At Edenhall, under its late respected owner and his father, the grand old customs of the olden times have been continued. The same may be said of Muncaster Castle, and many more of our county houses, showing us that the men of Cumberland have warm hearts, and dispense to their less fortunate brethren with no niggardly hand the “roast beef of Old England.” We see as each year rolls by and brings back the Christmas season, the grandest of all old Cumberland customs, namely, a large-hearted, generous hospitality.



PRESIDENTIAL ADDRESS AT MARYPORT.

By J. B. BAILEY.

(Read October 27th, 1885.)

FOR many reasons I should have preferred that some one more worthy than myself had filled the Presidential chair this year. But, as it has fallen to my lot, I shall endeavour to fill it to the best of my ability, feeling certain that any shortcomings on my part will not be attributed by you to any want of loyalty to the Association.

Many ways appeared by which a suitable address might have been given ; but the same circumstances which have conspired to place me in this honourable position, have likewise, in a great measure, selected the subject for the present address.

As members of a Literary and Scientific Society, we have been accustomed almost to look upon our Association as an isolated one, unbound by any ties ; but such is not the case, as we are one of the members of a widely-spread organization. Many points in this union of societies are very imperfectly known, which, were they better known, might lead to a more keen appreciation of the advantages we possess, not only as a local association, but also as a member—and that one of the oldest members—of the “Cumberland and Westmorland Association for the Advancement of Literature and Science.”

It is then my object to show, as briefly as possible, the rise and progress of our local Association ; tracing out its various connections, and showing the advantages to be derived thereby ;

in the hopes that, having a clearer understanding of such matters, we may not only be thus better able to make a full use of our privileges, but also be more inclined to give a hearty support to an institution which I am convinced merits our warmest regards.

Previous to the year 1876, there were four isolated societies in Cumberland, each giving lectures on literary and scientific subjects. With the very laudable wish to draw these into more immediate connection, the late Rev. J. Clifton Ward, F.G.S., convened a meeting, on February 28th, 1876, at which these four societies, viz.—Whitehaven, Keswick, Cockermouth, and Workington—were united into what became known as the “Cumberland Association for the Advancement of Literature and Science.” It is not my intention to deal exhaustively with the rise and progress of this Association, but two or three points require notice, viz: (1) That on September 25th, 1876, our own Society came into existence, being shortly afterwards formally affiliated with the Cumberland Association. (2) That in 1883 the Cumberland Association was informally affiliated with the “British Association for the Advancement of Science,” the formal affiliation having taken place a few weeks ago. And lastly, That owing to the affiliation of two Westmorland Societies, the title of the Cumberland Association was, on June 6th, 1884, altered to the “Cumberland and Westmorland Association for the Advancement of Literature and Science.” The following nine Societies in Cumberland, viz: Whitehaven, Keswick, Workington, Maryport, Longtown, Carlisle, Silloth and Holme Cultram, Brampton, and Penrith, together with Ambleside and Windermere in Westmorland, constitute the Union, which term we will now use, instead of the longer and more precise one.

It is generally allowed that “union is strength.” This being so, we will briefly examine the constitution, etc., of our Union, to see whether it really does give strength; in short—whether it is an advantage or a disadvantage to belong to it. However vigorous and well managed a single society may be, it must, almost of necessity, have within it the elements of decay; and this is more particularly so in the case of a small society. As the various

local secretaries can tell, there are occasions when it is most difficult to procure sufficient local help to make a complete programme. Clearly, then, if the society is not to collapse, it must look out for its lectures elsewhere. To supply the want by *professional* lecturers, would require a much larger sum of money than such societies, as a rule, possess. But there is no need to trust to this method for even a small proportion of the lecturers, for, theoretically, an ample supply of competent lecturers is always available for every society affiliated with the Union, and this at very small cost to the local association, viz.—the travelling expenses of such lecturers. There need, then, be no anxiety as to the sessional arrangements. Apart from the Union, it does not seem probable that there would be such a number of lecturers available, at least under present conditions. Thus the value of the Union is greatly enhanced. The method of the appointment of these lecturers may be, and doubtless is, open to objection, but we shall refer to this question presently.

In addition to the above advantage, we have what is called an "Association Lecturer," i.e., one who, being engaged by the General Council, lectures before each of the societies in the Union, and is paid in part by the Council, and in part by the individual societies.

Again, the Union publishes a record of the transactions of the various associations, which an ordinary local association would be precluded from doing. These *Transactions* are, theoretically, of great value, as they encourage the study of local matters, the record of which may be desirable. Each local association with fewer than one hundred and fifty members has a right to recommend *one* paper for publication, whilst if of more than one hundred and fifty members, *two* papers may be recommended. Besides this, the general reports of the local associations are recorded, together with that of the Union, and the proceedings at the annual meeting of the Union. Yet again, a new departure has been taken in the publication of short notices, called "Local Scientific Notes and Memoranda." So important a matter does this appear, that it is to be hoped it will be largely supported in future issues.

But even this does not exhaust all the benefits of the *Transactions*; but as they are more in matters of detail, there will be no need to refer to them here. As it is, four societies give them free—of which our society is one. If every society could see its way to do the same, the Council would be free to extend the sphere of the usefulness of this publication, and thus render it more generally acceptable. Many ways might be suggested to meet this end; but if Rule 8 were to be amended so as to include Abstracts of Papers other than those provided for by the Rule, this would doubtless be to the material advantage of the publication. It is quite clear that although a large society might publish a record of its own transactions, the smaller societies would be quite unable to do this, and thus, for want of co-operation, much useful matter would be lost.

It may be worth remark that this publication is exchanged for those of several other societies, including the British Association, London Geological Society, U.S. Geological Survey, Berwickshire Naturalists' Club, Yorkshire Naturalists' Union, Essex Field Club, Midland Union of Natural History Societies, &c. In this way the nucleus of a circulating library might be established, which, if not proving a universal benefit, would at any rate benefit many.

It may now be asked, of what use it is that our Union should be affiliated with the British Association. To be connected with so august a body may be an honour, or it may be the contrary; it seems most probable, however, that the balance is greatly in favour of its being an honour. It at once raises the status of our Union, and through it that of the various local associations, besides which it greatly increases their usefulness. It may be that we cannot either individually, or as an association, render much aid towards the elucidation of many of the questions suggested for solution by the British Association; still, the field of labourers is greatly extended, and the more widely such associations are scattered, the more likely is it that success will attend the efforts of those who seek to advance Science. Many of the observations rendered necessary are only to be relied on when they are very general in their distribution. Of course, we may be able to accomplish but little, still we ought to remember that even this is of great value as

adding to the sum total, for it is "Trifles" that "make perfection." Hence we have not only an object in view, but also a certainty that that object will be appreciated.

Certain advantages are accorded to those societies which may become corresponding societies of the British Association, but it is not necessary to discuss them here.*

It might be tedious to name all the various ways in which it is proposed to carry out the suggestions of the British Association ; but we may name a few most likely to be carried out amongst the members of our Union, viz :—Observations on the Rain-Fall ; Luminous Meteors ; Rate of Increase of Underground Temperature ; Character of the Water Supply ; Position, Height above the Sea, and Lithological Character of Erratic Blocks ; Erosion of Sea-Coasts ; Ancient Earthworks ; Prehistoric Remains ; Observations regarding the Peculiarities, Times of Flowering, etc., of certain Plants ; Arrival of Migratory Birds ; Appearance of certain Injurious Insects ; Working of the Elementary Education Code ; Elementary Science in Schools, etc. This is a formidable array ; but I should only have wearied you with the recital of the list as given in No. VIII. of the *Transactions*. Some of them seem trivial, still they are necessary where a law is to be formulated. Of course the advantages to be derived by our consideration of this scheme may be merely negative ; but they may also be real. This end may be secured if we would only take up one or more of the topics named, and make a thorough study of it ; and this, by the way, is the end and aim of our own and kindred societies. At least two of these subjects are separately dealt with by the "Cumberland and Westmorland Antiquarian and Archæological Society." That our Union is at any rate doing a something in the matter, is clear, for in the last Report of the British Association there are the titles, etc., of eight papers named as printed in No. IX. of the *Transactions* of our Union, and which come within the scope of the syllabus just quoted. To fully carry out the intention, each society might appoint a kind of permanent sub-committee, willing to devote some time to systematic work. In Maryport we might well consider : (1) The many questions arising out of the ancient

history of the place ; (2) The Erosion of the Sea-Coasts in the past, which raises up the interesting question of the submerged forests, of which the Rev. J. S. Craig is shortly to speak ; and (3) The Erosive Processes still going on. Nor do we sacrifice our freedom of action by so doing, for in carrying out these suggestions we may be conferring a national benefit in addition to the individual one, so that we shall be "twice blessed."

As I have already shown, the Union is theoretically sound, but practically it is defective. The various societies are too much on the footing of isolated societies, and hence the benefits of membership are reduced to a minimum. What we want is, that the societies shall more thoroughly feel that they are the incorporated elements of one whole.

But the question is, How is this co-operation to be promoted? It may be done very simply, and at the same time effectually. As it is, Local Secretaries have frequently much trouble in completing their programme, the last name or two often causing great anxiety, and not a little expenditure of time and patience. The cure for this state of things is in the word "centralisation." Local Secretaries may be able to prevail upon members to read a paper that has been prepared for the local society, before a neighbouring society ; and it would be quite within their province to do so. Even though they should be unsuccessful in getting a promise, still the members are reminded that they are not merely members of a local association, but of a more widely spread association. If successful, however, they would then forward the name of the lecturer ; the subject of the paper ; and the most suitable time for its delivery, to the General Association Secretary. The Council and the General Secretary might add to this list. Then, when a society is in want of one or more lecturers, instead of hunting through the length and breadth of the two counties for suitable persons, all the Secretary need do, would be to communicate his wishes to the General Association Secretary, who could at once recommend lecturers. Such a method would greatly widen the range of choice both as regards lectures and lecturers, and so lessen the probabilities

of disappointment, and more effectually bring the benefits of the Union before the individual societies.

But in another particular can valuable help be given. Each Secretary, in sending up his annual report, might state as explicitly as possible, how the society has been worked during the past session; stating both the excellencies and the failings, with suggested remedies for the latter. By this means other societies, and especially younger ones, could be guided as to the best means of ensuring the success, not only of the local associations, but also of the Union—for the success of the latter is dependent on that of the former. Besides, there might with great advantage be an interchange of views between the Committees of the various societies, as to ways and means, etc., whilst the mere interchange of programmes is an inexpensive but sure testimony of our unity. Inter-association field-days would also greatly tend to strengthen the bonds of union.

A few words are still necessary with regard to our own Society in particular. It has been said that we are declining in influence, and that our lectures are not so well attended as they were in the earlier sessions. This may be true, or it may not; but we must remember that success is not necessarily measured by numbers. In the earlier part of our career, there was no kindred society; now there are two or three other flourishing societies, all having the same aim, and for this there is cause for much congratulation. There is plenty of room for every agency that has for its object the improvement of the mind—and all are well worthy of our support. Hence we may reasonably claim that we are in every respect in a prosperous condition, and we ought therefore to use every legitimate means to keep it so. It will be readily allowed that the programme for the tenth session—upon which we are now entering—is an eminently satisfactory one, reflecting great credit upon the labours of the Secretary. There is, however, a weak point in it, and that is the small number of *local* names that appear. For obvious reasons, it would be well to have at least half the lectures by local men, if possible.

But even a good programme is not sufficient to make a successful

society. It certainly provides suggestive subjects, but it cannot give effect to them—that is not the duty of the society, but of the individual. To make our association more popular, we want *continuity* in our work. Too frequently this ends with the lectures; and before another course is arranged, the Society has almost slipped out of mind. The session ought to be divided into two, viz., a Winter Session for lectures; and a Summer Session for excursions, field-days, etc., which are of great practical benefit if properly managed. It may not be possible to arrange a field-day for one society; but, as members of a Union, they can certainly be carried on, as I have already suggested, in connection with other societies. The benefits of such meetings must be obvious to those wishful of obtaining a practical acquaintance with geology, botany, etc.

But we may make our Society still more popular by having a something—it may be external to itself—round which we may rally, so to speak. No one can doubt the educative power of a Museum; but we could scarcely hope to establish a satisfactory local one. Still, if we cannot imitate Carlisle, Whitehaven, and Keswick in this respect, there seems no reason why we should not support one or other of them. Then, last year witnessed the formation of a S. John Ambulance Class. So very successful was it, that there is the promise of an extended field of labour this year in the same direction. And lastly, Science Classes might be established in connection with the Society. The benefits of such classes are too obvious to call for comment.

In conclusion, this address has been spun out to a much greater length than I had originally intended, but I cannot sit down without asking you, by your attendance at the lectures, to give each lecturer that welcome which his otherwise unrequited services deserve, and at the same time, by your hearty co-operation, to endeavour to make the Society what it ought to be—a Society for the promotion of Literature and Science.

OLD-FASHIONED INNS.

BY W. WILSON.

(Read at Keswick.)

PART I.

INNS, or places for the lodgment and entertainment of travellers, are an institution of great antiquity; they are mentioned in some of the oldest writings, and were probably made use of by nations from whom no written records have descended to us. They are frequently mentioned in the Holy Scriptures. We are all familiar with the story of the event that revolutionised the world, which took place in a stable because "there was no room at the inn;" also of the man who fell among thieves, how his wants were ministered to by the good Samaritan, who set him on his own beast and brought him to an inn and took care of him.

The inn of oriental countries is the khan or caravansery. It is a large enclosed space, sometimes of as much as an acre in extent, surrounded by a brick wall something like two feet high; the entrance is by a large gate. The inner quadrangle is entered by an archway over which lodges are sometimes constructed for visitors of distinction. Near the porch there is accommodation for the keeper, and also shops for the convenience of wayfarers. The interior is surrounded by a piazza which often forms a very spacious quadrangle, and the visitors sleep under the arches. The spacious court in the middle is used for the accommodation of caravans, and is often crowded with camels and their loads of

baggage. The habits of orientals have changed but little, if any, since the time the Scriptures were written; and many of these tarrying places receive travellers to-day in much the same way as they did two thousand years ago. I have it on the authority of a traveller who has visited the Holy Land, that the Khan of Chimham, near Bethlehem, mentioned in Samuel and Jeremiah, is supposed by those who have studied the subject, to be the very inn, in the stable of which was born the Saviour.

“Nothing,” says a recent writer, “is stronger evidence of the size and populousness of Herculaneum, than its nine hundred public houses.” A placard discovered on the wall of a villa in that ruined city was a bill for letting one of its public houses on lease; and hence it appears they had galleries on the top, and balconies or green arbours and baths; and the landlord had a particular dress—a characteristic followed at the present day, not only in the East, but in European cities, especially Warsaw. Landladies wore a tucked up gown, and brought the wine in vases for visitors to taste; they had common drinking vessels same as with us, and sometimes the flagons were chained to posts.

Professor Rhys tells us, the Saxons had public houses, where they used vessels of earthenware. The Anglo-Saxon had the *eala-hus* (ale-house), *win-hus* (wine-house), and *cumen-hus* (inn). Ale houses are mentioned in the laws of Iva, King of Wessex. Booths were set up in England in 728, where laws were passed for their regulation, and enactment after enactment has been passed since: now with a purely social, and now with a purely fiscal object in view.

During the middle ages (see “History of Signboards,”) in accordance with the customs then prevalent, the lords of manors frequently displayed their coats of arms in front of their castles or manor houses, to show who was lord and master in those parts, and in some measure performed the duties of innkeepers. The keep of the castle, or the lower room of the manor house, was open to all kinds of wayfarers, and in those days was seldom without a visitor or two: either travelling mechanics, or persons acquainted with mysteries—as trades or professions were termed

in those days—or vagabond soldiers on tramp for a new master to fight under; all arrangements resting with the house steward, who made charges for extra privileges enjoyed by the guests; and on his catering, whether liberal or otherwise, depended the comfort of the establishment.

As population increased, and the number of travellers became greater, the places of accommodation set apart at the castles and manor houses in time became too small for the numbers seeking lodgings for the night. In such cases the steward, if he was an old servant of the place, had a detached house provided, and was allowed to carry on business in connection with head quarters. The family arms were still permitted to be hung in front, and gave a name to the establishment. If a lion gules were displayed on the heraldry, it not unnaturally attained for the house the name of the Red Lion; and if the emblem were azure, the Blue Lion; in time the innkeepers adopted these devices in order to inform the public that they offered accommodation for man and beast.

“The Adventurer,” in 1752, expresses indignation at the fraternity of publicans for the extravagance displayed in the selection of signboards. “Their modest ancestors,” he goes on to say, “were content with a plain bough stuck up before their doors, whence arose the wise proverb, ‘Good wine needs no bush;’ but how have they since deviated from their ancient simplicity? They have ransacked earth, air, and seas, called down sun, moon, and stars to their assistance, and exhibited all the monsters that ever teemed from fantastic imagination. Their Hogs in Armour, their Blue Boars, Black Bears, Green Dragons, and Golden Lions, have already been exposed by your brother essay writers. What reason can there be,” he asks, “why the glorious Duke William should draw porter, or the brave Admiral Vernon retail flip? Why must Queen Anne keep a gin shop, and King Charles inform us of a skittle ground? Propriety of character, I think, requires that these illustrious persons should be deposed from their lofty stations, and I would recommend hereafter that the alderman’s effigy should accompany his ‘Entire butt beer,’ and the comely face of that spirited patriot who first reduced the price of punch, and raised

its reputation *pro bono publico*, should be set up wherever two-penn'orth of rum warm be sold. I have been used to consider several signs—for the frequency of which it is difficult to give any other reason—as so many hieroglyphics with a hidden meaning satirising the follies of the people or conveying instruction to passers-by. Tumble-down-Dick, in the borough of Southwark, is a fine moral on the instability of human greatness and the consequences of ambition; but there is a most ill-natured sarcasm against the fair sex exhibited on a sign in Broad-street, St. Giles', of a headless female figure called the Good Woman." The original meaning of "Good Woman," it is said, was a female saint who had met her death by being deprived of her head; and this in time was turned into a joke against females of alleged loquacity. The sign of the "Silent Woman" has the same meaning. A somewhat similar sign is the "Honest Lawyer." A limb of the law is represented with his head in his hands, which is the only way it is supposed he can possibly be honest.

The meaning of many of the old-fashioned signboards is often obscure, owing to their original signification having in numbers of cases been altered and corrupted. The "Pig and Whistle" is an instance. In some of the old towns it is still to be found on signboards. A sow is represented sitting on her haunches playing on a whistle—a most unnatural proceeding. The "Peg and Wassail" was probably the original sign, and the following in all likelihood gives the explanation. Wassail was a favourite liquor amongst the ancients. It was made of ale, sugar, nutmeg, and ginger, and is said still to be prepared by some old fashioned families about Christmas time. Pegge in his "Anonymiana" has described these peg tankards with some minuteness. They have in the inside a row of eight pins, one above another, from top to bottom. The tankards hold two quarts, so there is a gill of ale—i.e., half a pint of Winchester measure—between each pin. The first person that drank was to empty the tankard to the first peg or pin; the second was to empty to the next pin, etc., by which means the pegs were so many measures to the comotators, making them all drink alike, or the same quantity. And as the distance of the pins was such

as to contain a large draught of liquor, the company would be very liable by this method to get drunk, especially when if they drank short of the pin or beyond it, they were obliged to drink again. The old saying, "taking him down a peg," probably owes its origin to the above custom.

At Penrith we have another instance where the original meaning has been probably altered in the signboard of the "Bell and Bullock" inn of that town. If we seek for a connection between a bell and a bullock it is difficult to find any satisfactory explanation. It is thought by some they have been united simply on account of alliteration; but the more probable reason is that the original sign was "Bell and Book," in days when the inhabitants of Penrith took oath by "bell, book, and candle." After Henry VIII. captured Boulogne harbour, "Boulogne Mouth" became a popular sign. It soon became corrupted into "Bull and Mouth," and there are two inns in London at the present day bearing that sign, and one in Leeds. Boulogne gates, which were ordered to be taken away by Henry VIII., also became a public-house sign, which was in time altered to "Bull and Gate" in the seventeenth century. There was a noted house in Holborn with this sign at that time. Readers of Fielding may remember this was the house where his hero, Tom Jones, put up on his arrival in London.

Great changes have taken place in modern times in regard to taverns. Formerly they were made the general places of resort by men of rank and genius, representatives of the "wit and wisdom" of the kingdom. The "Bear's Head" is celebrated as being the place where Henry V., when Prince of Wales, revelled with Falstaff and all the merry men of Eastcheap. The celebrated club at the "Mermaid" originated with Sir Walter Raleigh; and, as Mr. Gifford has truly observed, combined more talent and genius perhaps than ever met together before or since. "Here for many years regularly repaired Shakespeare, Ben Jonson, Beaumont, Fletcher, Selden, Cotton, Carew, Martin, Donne, and many others whose names even at this distant period call up a mingled feeling of reverence and respect. Here in the full flow and confidence of friendship, 'the lively and interesting wit combats,' as Fuller calls

them, took place between Shakespeare and Jonson, and hither, in probable allusion to them, Beaumont let his thoughts wander in his letter to Jonson from the country: 'What things have we seen done at the Mermaid! heard words that have been so nimble and so full of subtle flame, as if that everyone from whom they came had meant to put his whole wit in the jest.'

The "Devil" tavern, as stated in "Old and New London," stood at No. 2 Fleet-street. Shakespeare himself must day after day have looked up at the old sign of St. Dunstan tweaking the devil by the nose, that flaunted in the wind near the bar. Perhaps the sign was originally a compliment and mark of respect to the saint, whose church stood near. At the "Devil" the Apollo Club, almost the first institution of the kind in London, held its merry meetings, presided over by that grim yet jovial despot, Ben Jonson. The bust of Apollo kept watch over the door, and heard in its time millions of witty things, and scores of fond recollections of Shakespeare by those who personally knew and loved him. In the time of Charles II., the "Devil" became frequented by lawyers and physicians. The talk now was about drugs and latitits, jalap and the law of escheats. Yet still good company frequented it, for Steele describes Bickerstaff's sister Jenny's wedding entertainment there in 1809; and in 1710 Swift writes one of those charming letters to Stella, to tell her that he had dined on October the 12th at the "Devil" with Addison and Dr. Garth, when the good-natured doctor, whom everyone loved, stood treat, and there must have been talk worth hearing. An epigram runs:—

When laureates make odes, do you ask of what sort?
Do you ask if they're good or are evil?
You may judge, from the "Devil" they come to the Court,
And go from the Court to the "Devil."

In 1745 the Royal Society held its annual dinner in the old consecrated room. The Apollo-court, on the opposite side of the street, still preserves the memory of the great club-room at the "Devil." The "Devil" was pulled down and annexed by the neighbouring bankers.

"Mitre" tavern, where some of the most interesting of the

meetings between Dr. Johnson and Boswell took place, was pulled down in 1829, by the Messrs. Hoare, to extend their banking house. The original "Mitre" was of Shepherd's time. The present spurious "Mitre" tavern, in Mitre-court, was originally known as "Joe's Coffee House."

In the reign of Edward III. the excessive length of the tavern signs (ale-stakes as they were then called) was complained of by persons riding in Cheapside. All the taverns in the city were therefore summoned to the Guild-hall, and warned that no sign or bush (hence the proverb, "Good wine needs no bush") should henceforth extend over the king's highway beyond the length of seven feet, under the pain of a fine of forty pence to the Chamber of the Guild-hall.

"King's Head" tavern was kept at the restoration by William King, a staunch cavalier. It is said that the landlord's wife happened to be on the point of labour on the king's entry into London. She was extremely anxious to see him. The monarch being told of her inclination, drew up at the tavern in his good-natured way and saluted her. This tavern was long a depôt in the metropolis for turtle; and in the quadrangle of the house might be seen scores of turtles, large and lively, in huge tanks of water, or laid upward on the stone floor, ready for their destination. The house was refitted in 1852, but has since been pulled down.

In a work on Inns and Signboards we read:—"In 1711, at the 'Duke of Marlborough's Head,' in Fleet-street (off Shoe-lane), the great Posture Master of Europe, eclipsing the deceased Clarke *v.* Higgins, greatly startled sight-seeing London. He extends his body into all deformed shapes, makes his hips and shoulder bones meet together, lays his head upon the ground and turns his body round twice or thrice without stirring his face from the spot; stands upon one leg and extends the other in a perpendicular line half a yard above his head; with other postures tedious to mention. And here in 1718, De Hightreight, the fire-eater, ate burning coals, swallowed flaming brimstone, and sucked a red-hot poker five times a day. What will my billiard-loving friends say to the St. Dunstan's inquest of the year 1720? 'Item, we present Thomas

Bruce, for suffering a gaming-table (called a billiard-table, where people commonly frequent and game) to be kept in his house.' At the 'Globe,' in 1717, was shown Matthew Buckinger, a German dwarf, born in 1674, without hands, legs, feet, or thighs; twenty-nine inches high; yet can write, thread a needle, shuffle a pack of cards, play skittles, etc. In 1822, the exhibition of a mermaid here was put a stop to by the Lord Chamberlain."

Sir John Hawkins, in his life of Dr. Johnson, describes a night's festivity in which the celebrated lexicographer and his friends joined. Sir John tells us, "One evening at the Ivy Lane Club, Dr. Johnson proposed to us celebrating the birth of Mrs. Lennox's first literary child, as he called her book, by a whole night spent in festivity. The place appointed was the "Devil" tavern, and there about the hour of eight Mrs. Lennox and her husband, and a lady of her acquaintance now living (1785), as also the club and friends to the number of near twenty, assembled. Our supper was elegant, and Johnson had directed that a magnificent hot apple-pie should make a part of it; and this he would have stuck with bay leaves, because, forsooth, Mrs. Lennox was an authoress, and had written verses; and further, he had prepared for her a crown of laurel, with which, but not until he had invoked the muses by some ceremonies of his own invention, he encircled her brows. The night passed, as must be imagined, in pleasant conversation and harmless mirth, intermingled at different periods with refreshments of coffee and tea. About five, Johnson's face shone with meridian splendour, though his drink had only been lemonade; but the far greater part of us had deserted the colours of Bacchus, and were with difficulty rallied to partake of coffee, which was scarcely ended when the day began to dawn. This phenomenon began to put us in mind of our reckoning, but the waiters were so overcome with sleep that it was two hours before we could get a bill, and it was not till near eight the creaking of the street door gave the signal for departure."

Dr. Johnson's was an age when heavy drinking was fashionable, and he recommended "port for men, sherry for women, and brandy for heroes." But he was not a toper, being very fond of

tea. Readers of Boswell's life of the great moralist will, however, find an occasional vinous indiscretion recorded. The disgrace in those days was not in getting inebriated, but in being unable to carry your liquor.

The "Salutation and Cat," in Newgate-street, was at one time noted as a place of resort for celebrated men, one tradition of the house being that Sir Christopher Wren used to smoke his pipe there, while St. Paul's was in the course of re-building. Sir T. N. Telford, in his life of Charles Lamb, informs us that "this was the house where Coleridge usually met Charles Lamb when in town, and in a little smoky room they sat together smoking oronoko and drinking egg nogg, the first discoursing of his idol Bowles, and the other rejoicing mildly in Cowper and Burns; or both dreaming of Pantisocracy and golden days to come on earth." When Lamb, in 1818, collected his works, he makes the following allusion to their former meetings at this tavern:—"Some of the sonnets which shall be carelessly turned over by the general reader may happily awaken in your remembrance—which I am sorry should ever be totally extinct—the memory of sunny days and delightful years, even so far back as those old suppers at our old inn, when life was fresh and topics exhaustless, and you first kindled in me, if not the power, yet the love of poetry and beauty and kindliness." And this meeting place of the poets was at the sign of the "Salutation and Cat," a curious combination of terms. The following explanation is given in *Notes and Queries*, from which is derived my information on the subject:—"A lithograph which was hung in the coffee room of the inn was presented to the proprietor by one of the Ackermanns. An aged dandy is saluting a friend whom he has met in the street, and offering him a pinch out of the snuff box which forms the top of the wood-like cane. This box knob was, it appears, called a cat, hence the connection of terms apparently so foreign to each other." The salutation on some of the old signboards represented an angel saluting the Virgin Mary.

Among literary men, few had during his time more experience of inns than "Bobby Burns, the poet," as he loved to call himself.

There are numberless stories told of his wonderful ready wit, displayed when in festive company in the bar parlour. A visit to the "Globe," a small licensed house in the town of Dumfries, is interesting to all admirers of the bard of Scotland. It is a very old-fashioned house, scarcely altered in appearance since the poet lived in that town, and who, alas! too frequently sat by the "ingle nook" in its little back parlour, surrounded by an admiring company with "foaming tankards" before them. Some articles of furniture then in use are still doing service in that interesting old room. You may take snuff from the same snuff-box, drink from the same tankard, and sit in the very same arm-chair as did the immortal bard. Several rhymes in Burns' handwriting are scratched on the window panes; and it is easy to imagine from the surroundings, that his spirit still lingers about the place. I give one of the verses, said to have been written in admiration of the barmaid:—

Oh! lovely Polly Stuart,
 Oh! charming Polly Stuart,
 There's not a flower that blooms in May,
 That's half sae fair as thou art.

The guests of an inn in the old time were sometimes in the habit of leaving specimens of their wit behind in rhyme, the same as tourists and other travellers do in the "visitors' book" of the hotels at the present day; many of these are on record, and a collection could not fail to be amusing. One or two specimens of this kind of humour may be interesting. I select one said to have been written by a commercial traveller on an inside window-shutter of the "Golden Lion," Brecon, kept by Mr. Tom Longfellow, and here it is:—

Tom Longfellow's name is most justly his due :
 Long his neck, long his bill—which is very long too ;
 Long the time ere your horse to the stable is led,
 Long before he's rubbed down, and much longer till fed ;
 Long indeed you may sit in a comfortable room,
 Till from kitchen long dirty your dinner shall come ;
 Long the often told tale that your host will relate,
 Long his face while complaining how long people eat ;
 Long may Longfellow long, ere he see me again,
 Long 'twill be ere I long for Tom Longfellow's inn.

Here is a cutting from the newspapers :—"A certain village inn had the honour of lodging an editor, to whom a separate bedroom was assigned. One night he was absent, and the house being full, the landlord or landlady put a stranger in his bed. The morning found he had decamped, leaving the following lucubration in his room :—

I slept in an editor's bed last night,
 And others may say what they please ;
 I say there's one editor in the world
 That certainly takes his ease.
 When I thought of my humble cot away,
 I could not suppress a sigh ;
 But thought as I rolled in the feathery nest,
 How easily editors lie.

When the editor returned and perused the above, he smiled and added :—

The chap whose form has rested here,
 And left his copy behind,
 For a bad impression should be locked up,
 For the cut is most unkind.
 Behold a proof of how he lies :
 In the morning he went away,
 And like many that use an editor's sheet,
 He had forgotten his bill to pay.

It has often been a subject of comment why the parish church and the inn should in so many villages be in close proximity. One reason given is that in former times, when places of worship were not so numerous as at present, the parishioners living at the extreme boundary of the parish, had in many cases several miles to travel in order to attend church service. On such occasions as christenings, weddings, or funerals, the village inn was a useful place of accommodation for those who had far to travel, and needed refreshment for themselves or horses, previous to their return home. Defoe does not seem to have liked the arrangement, judging from the following lines, of which he is the author :—

God never builds a house of prayer,
 But the devil erects his dwelling there ;
 And 'twill be found on examination,
 The latter holds the biggest congregation.

[NOTE.—*The Council are indebted to the Author for bearing the expense of printing the foregoing part of his Paper.*]

PART II.

IN the Lake District we have old inns, some of which exhibit curious sign boards, and some account of these may prove interesting. At Troutbeck, in Westmorland, near to the house where Hogarth the painter was born, is an old inn with the sign of "The Mortal Man." Julius Cæsar Ibbotson, a well known artist, frequently stayed at this inn about the beginning of the present century. He was a man of jovial disposition, and very popular, and many nights of conviviality were spent at Sally Birkett's (who was the landlady) by the artist and his friends. At a time when money was scarce with the guest of the inn, it was agreed between him and the landlady that he should paint a new sign for her, and they should be quits; and this arrangement he accordingly carried out. It was a picture representing two men, the one fat and jolly, with a rubicund nose; the other pale and thin. These were said to be the portraits of two local celebrities, Ned Partridge and Nat Fleming. Below were the following lines:—

Thou mortal man that lives on bread,
 What is't that makes thy nose so red?
 Thou silly ass, that looks so pale,
 It is by drinking Sally Birkett's ale.

This unique signboard is unfortunately no longer in existence. The inn, however, is still known as "The Mortal Man."

The following story is told of Ambleside. There was an old inn in the town which bore the name of "The Cock." This, along with some other property, was purchased by Dr. Watson, Bishop of Llandaff. In compliment to the new proprietor, mine host conceived the idea of changing the signboard, thinking at the time the sign of "The Bishop" would be more taking, and, altogether, more appropriate than the homely old signboard with the picture of a farmyard cock. A rough portrait, which somewhat resembled the bishop with his shovel hat and episcopal wig, was accordingly produced and fixed up in the place of the cock. An opposition man started another inn in the meantime, and,

curiously enough, adopted the discarded sign of "The Cock." Whether the inhabitants of the town were partial to the new landlord or the old sign is uncertain, but before very long the new inn received more than its due share of custom. The landlord of "The Bishop," thinking that the loss of business he had sustained might be owing to the habit customers had formed of going to the sign of "The Cock," set his wits to work to rectify the mistake. He was quite equal to the occasion. A new board was procured and placed immediately below the portrait of the bishop. It contained the following inscription—"This is the Old Cock."

Mr. Budworth, the author of "A Fortnight's Ramble to the Lakes," (a book which was published in 1792,) gives an interesting account of the places he visited and the inns he patronised during his peregrinations through the district. His head-quarters in the Windermere district was "The Salutation," Ambleside, at that time kept by a landlord named Wilcox,—a place at which the author says he always felt himself at home. The number of tourists visiting Ambleside in those days must have been small. The "Rambler," as our author frequently calls himself, speaks of Bob Partridge as being guide, boots, postillion, and boatman at "The Salutation," the head inn of the town. Under the guidance of Bob he made several excursions to different places of interest in the neighbourhood, and always speaks of him in the highest terms. A visit to the "Red Lion," Grasmere, is worthy of mention. It was kept at the time by Robert Newton. From that inn the "Rambler" ascends Helm Crag, and then returns to dinner and notes the particulars of what that meal consisted. Roast pike stuffed, a boiled fowl, veal cutlets and ham, beans and bacon, cabbage, pease and potatoes, anchovy sauce, parsley and butter, plain butter, butter and cheese, wheat bread, and oat cake, three cups of preserved gooseberries, with a bowl of rich cream in the centre. This was a wonderful spread for two people; and the landlord of the "Red Lion" does not appear to have been in any hurry to become rich, his charge for the two meals being tenpence each. The "Cherry Tree," formerly an inn in Wythburn, but now no longer licensed, was also visited by Mr. Budworth and his

guide, who at this place had a second breakfast after descending from the top of Helvellyn. They had here set before them muttonham, eggs, buttermilk, whey, tea, bread and butter, and were asked to have cheese—and the charge was sevenpence each ! Plentiful as was the spread in this case, the hostess of the “Cherry Tree” seems to have been able to hold her own, as a grandmotherly old lady between eighty and ninety informed them that she had seen sixteen landlords out of a house that wished to oppose them. Whether the opposition place was “Nag’s Head,” in Wythburn, or “King’s Head,” Legburthwaite, we are not informed, but it was probably one or the other.

The landlord of the “King’s Head,” John Stanley, was known as a facetious character, and many anecdotes of him are still remembered in the vale. There is the story of the bagman riding up to his door one dark night and enquiring how far he was from the “Nag’s Head,” an inn not far away. “Only t’ length o’ t’ neck,” was the prompt reply of the landlord. The traveller, thinking from the remark that he had reached the end of his journey, dismounted, took a bed, and stayed for the night. In the morning he discovered his mistake, whereupon he tackled “mine host,” but was obliged to admit, on explanation, that he got a correct answer to the question put by him the night before—that, although he was still a few miles from the “Nag’s Head,” Wythburn, the inn which he intended to patronise, he was only the length of the neck from his own nag’s head. The signboard belonging to John Stanley is still kept at the “King’s Head,” Thirlspot, and is in a good state of preservation. The rhyme is said to have been his own composition ; it reads thus :—

I. Stanley lives here, and sells good ale,
 Come in and drink before it grows stale,
 John succeeded his father Peter,
 But i’ th’ old man’s time ’twas never better.

A favourite house of call on the road between Penrith and Keswick, in the old coaching days, was the “Sun Inn,” Hutton Moor End. It was kept for nearly a decade of the last century, and during the whole of the first half of the present one, by a

very deserving couple, Isaac and Betty Hutchinson. During the latter part of her life old Betty was very lame, and had to move about on crutches; but it was seldom she was absent from the "ingle nook," and numbers of people when travelling that way called in to see the old lady and enjoy the lively "crack." Old Isaac, on the other hand, was quiet and retiring, his wife doing all the talking. After the celebrated firm of Bass and Co. had made a success with their India Pale Ale, an agent was sent to introduce that beverage to the inns of the Lake District. The late Mr. John Atkinson, of the "King's Head," Thirlspot, at that time a large cattle dealer, and well known all over the district, accompanied the traveller for the purpose of introducing him to parties likely to become customers. Among the rest they called on old Isaac and told him how Bass's beer was likely to be asked for by coach passengers and other tourists, how that it had become so popular as a drink, and begged to be allowed to place a good order in his hands. They received from the old man the following reply:—
 "I git aw my yal fra Alfred Eemison o' t' Burns, an' it's allus varra good; bit I divvent want to be unneighbourly,—what, ye mun send me a hofe quarter" (a cask containing four-and-a-half gallons). A tablet inserted in the wall of the front side of the house, facing the old turnpike road, bears a somewhat remarkable inscription:—

MDCCLXIX.

This building's age these letters show;
 Though many gaze, there's few that know.

This was probably true when the rhyme was first placed there—that is one hundred and sixty-seven years ago. At that time the surrounding inhabitants possessed little or no education, and the author probably intended it as a sarcasm upon the ignorance of the people.

The "Fish Inn," Buttermere, has for a long time been famous as being the home of "Mary, the Buttermere beauty," whose brief romance excited so much sympathy about the end of last century. She was first brought into notice by the author of "A Fortnight's Ramble to the Lakes," who thus described the "Maid of the inn,"

as she appeared on his first visit:—"Her mother and she were spinning woollen yarn in the back kitchen. On our going into it the girl flew away as swift as a mountain sheep, and it was not till our return from Scale Force we could say we first saw her. She brought in part of our dinner, and seemed to be about fifteen. Her hair was thick and long, of a dark brown, and though unadorned with ringlets, did not seem to want them. Her face was a fine oval, with full eyes, and lips as red as vermillion. Her cheeks had more of the lily than the rose, and although she had never been out of the village—and I hope will have no ambition to wish it—she had a manner about her which seemed better calculated to set off her dress than 'dress her'; she was a very Lavinia,

Seeming when unadorned, adorned the most.

When we first saw her at her distaff, after she got the better of her first fear, she looked an angel, and I doubt not she is the reigning lily of the valley." Mr. Budworth, with whom Mary seems to have been a great favourite, again visited "The Fish" some years after writing the above description of her. On this occasion he was present at a dance or merry night, held for the benefit of the local fiddler, where he mixed freely with the company. "They were," he says, "the very rosiest cheeked mortals I ever saw. The men kept excellent time, and rattled on the floor with a variety of steps; the women danced as easily as the men determinedly. The dance was never long, and the moment the fiddler ceased another set that were ready called a fresh tune and began. I was glad to notice a black eyed youth hand out Mary and another young girl and call for a reel; and I honestly say I never saw more graceful dancing or a woman of finer figure to set it off than Mary of Buttermere." Mary was the only daughter of Mr. and Mrs. Robinson, an old couple who kept "The Fish" inn; and the author of the foregoing eulogium afterwards deplored that he had not left poor Mary to blush unseen, instead of introducing her to the public by the glowing delineation of her rustic beauty given in his "Fortnight's Ramble to the Lakes," in which he published the account of the places visited by him and other matters in connection therewith, during his rambles through the Lake Country.

Whether this had connection with the misfortune which afterwards befel the "Beauty of Buttermere," is not easy to decide; but the little inn was sometime afterwards visited by a scoundrel who assumed the name of the Hon. Colonel Hope, and represented himself to be the next brother to the Earl of Hopetoun, and, to make a long story short, he made love to the village beauty and in a short time married her. The account of the marriage found its way into all the newspapers, and brought to light the fact that the real Colonel Hope had been abroad the whole summer, and that the impostor who had heartlessly deceived poor Mary was an unmitigated villain named John Hatfield, who had previously deserted one wife—by whom he had three children—had afterwards been married to another (his first wife being still living), whom he also deserted, leaving her with two infant children. A short time after his marriage with Mary he discovered that the officers of the law were on his track, and left the village with the idea of escaping justice. After being tracked from place to place he was apprehended near Swansea and committed to Brecon Gaol. He was afterwards taken to London, and examined before the magistrates, where charges of forgery and bigamy were brought against him. He was then committed to take his trial at the next Carlisle Assizes, where he was proved guilty of various charges of forgery. Capital punishment was at that time the penalty for forgery, and the villain who brought ruin on the unfortunate women he so cruelly deceived was ignominiously executed at Carlisle, September 3rd, 1803. Coleridge, Southey, and Wordsworth, the lake poets, to whom she was well-known—in fact all classes of society—took great interest in Mary, whose conduct under her misfortunes was marked throughout with propriety and good sense, and her story was afterwards dramatised and acted in the London theatres. Coleridge says: "In looking back upon that frightful exposure of human guilt and misery, that the man who, when pursued by these heart-rending apostrophes and this litany of anguish sounding in his ears from despairing women and famishing children, could yet find it possible to enjoy the calm pleasures of a lake tourist, and deliberately hunt for the picturesque, must have been a fiend

of that order which fortunately does not often emerge among men.' Mary was afterwards married to a respectable yeoman of the district, by whom she had a large family, and, according to the poet Southey, became "fat and good-looking." One of her grandsons is at the present time the owner of the "Fish Inn," Buttermere.

Merry nights, similar to the one at which the Beauty of Buttermere was present, may be worth describing. The hard-working inhabitants of the northern counties of England in those days seldom indulged in taking holiday except at Christmas time, and then all work was thrown aside from Christmas Day till Twelfth Night. On the eve and early morning of Christmas Day, the village fiddler went from house to house playing each of the inmates a tune and wishing them a merry Christmas. On New Year's Day the musician again went his round in the same manner to enliven the villagers with his inspiriting airs, and towards the close of the festive season, the fiddler once more went his round, but on this occasion it was to collect subscriptions by way of a benefit. These subscriptions, as a rule, were freely given; he in return gave invitations to his subscribers to attend his merry night at a time appointed at the village inn. At the fiddler's merry night dancing was naturally the order: step dances, consisting of hornpipes, jigs, reels, etc., were kept up with great animation, the fiddler on that night providing the music gratis; and in addition to this, the guests were allowed an unlimited supply of bread and cheese and Christmas ale. If there happened to be more than one inn in the village, the dance was given in turn at each inn in the place. But nearly all the inns in country places had during Christmas time their annual merry night, at which times the greatest mirth and hilarity prevailed. For graphic descriptions of scenes which took place at their festive gatherings in the old times, we need only refer to some of the songs of Robert Anderson, and other Cumberland bards. The following verses from "The Bleckell Murry Neet," will give an idea of the energy at times displayed:—

The clogger of Dawston's a famish top hero,
 And bangs aw the player fwok twenty to yen';
 He stamped wid his fit an' he shouted an' roystered,
 Till the sweat it ran off at his varra chin end.

Then he held up a han' like the spout of a teapot,
 And danc'd Cross the Buckle and Leather to Patch,
 When they cried "Bonny Bell," he lap up to the ceiling,
 An' aye crack'd his thouns for a bit of a fratch.

Mr. Budworth records an incident which occurred at the dance he attended at Buttermere, which is characteristic of the untrammelled way in which the dalesfolk formerly took their enjoyment. "A stout man, more than six feet, belonging to Lorton, entered, and most piteously regretted he had not known of the dance, as his iron bound clogs were too heavy to dance in. Mine being by this time dry, I offered to lend them for the night, but he had the disappointment to find them too short, or he said, 'They wad hae duin varra weel,' though, by the bye, they weighed two pounds seven ounces. However, he soon was amongst the dancers, and footed it away in his stocking feet; and after they were worn out, bare-footed."

The most important gathering during the year in Keswick was formerly the first Saturday in the New Year, known then as now, as "Auld folks' Saturday." This was a day on which business and pleasure were supposed to be combined. The tradesmen of the town during the first part of the day presented and settled their outstanding accounts for the previous year as far as they were able, and the farmers and their wives, dressed in "their Sunday best" met and dined at the inn they made their head quarters during the year, in order to give the landlord of the establishment a benefit. There was always a sumptuous dinner provided for the occasion, and many of the tradesfolk of the town dined at the different inns which they patronised along with the farmers, and this was called "spending the shot." Music was played while the dinner was served, and after the tables were cleared, the guests assembled in the large room, and then commenced the patter of feet among the dancers to keep time to the jig tunes and other enlivening strains evoked by a manipulation of horse hair and catgut. The first Saturday in the New Year is still known in Keswick as "Auld Folks' Saturday," but it now exists only in name. A few of the "old stagers" who remember the former glory of this festival still

make it a point to "spend their shot," with "mine host at the inn," but there is no longer any approach to the mirth and hilarity of former days.

By an examination of the history of old inns of town and country, we find in connection interesting episodes in the lives of many of our greatest men, who were formerly in the habit of patronising them as meeting places for social enjoyment, and we are thus enabled to form an idea of some of the habits and customs of our ancestors who lived in bygone times, in days when—

The gentrie went to the King's Head,
The nobles into the Crown,
The knights went to the Golden Fleece,
And the ploughman to the Clowne.

"A tavern," says an ancient writer, "is a common consumption of the afternoon and the murderer or maker away of a rainy day. To give you the total reckoning of it, it is the busy man's recreation, the idle man's business, the melancholy man's sanctuary, the stranger's welcome, the inn of court man's entertainment, the scholar's kindness, and the citizen's country; it is the study of sparkling wits and a cup of canary their book." Goldsmith, in his beautiful poem of "The Deserted Village," thus describes the village inn:—

Near yonder thorn that lifts its head on high,
Where once the sign-board caught the passing eye,
Low lies that house, where nut-brown draughts inspired,
Where grey beard mirth and smiling toil retired,
Where village statesmen talked with looks profound,
And news much older than their ale went round.
Imagination fondly stoops to trace
The parlour splendours of that festive place;
The whitewashed wall, the neatly sanded floor;
The varnished clock that ticked behind the door;
The chest contrived a double debt to pay—
A bed by night, a chest of drawers by day;
The pictures placed for ornament and use;
The twelve good rules, the royal game of goose;
The hearth, except when winter chilled the day,
With aspen boughs and flowers and fennel gay;
While broken teacups, wisely kept for show,
Ranged o'er the chimney, glistened in a row.

We live in a world of changes, and since the commencement of the present century, in large towns these changes have been very great in regard to inns, as likewise with other institutions. Few of the old and formerly well-known licensed houses can now be considered "places of entertainment for man and beast," and the term licensed victualler is in most cases a misnomer. It is now difficult to find the respectable bar parlour, where the guests meet of evenings to pass an hour or so in improving conversation, political and other, while they smoke the pipe of peace moderately moistened with alcoholic stimulant, such places being few and far between. The innkeeper now-a-days makes his money by selling liquors over the counter of the long bar and depends on what is called the "standing-up" trade. But "old times are changed, old manners gone," and the "standing-up" trade of the gorgeously decorated long bar, where "two penn'orths" of liquor are sold to customers—which means small profits and quick returns—with social clubs now so numerous, have almost entirely superseded the cozy old bar parlour, so great an institution of last century. In the old time the bar parlour of the inn was used as a meeting place for poets, philosophers, and statesmen, consequently there are many poetic associations still connected with those places where social intercourse among great men was formerly held, but this sentiment, it is needless to say, no longer exists in the modern style of innkeeping.

There is one class which must not be passed without notice, inasmuch as they perhaps make more use of inns than any other—that is, the commercial travellers. The commercial room of the various inns patronised by them along their business route, has in the case of many to be their home for the greatest part of the year. In regard to the antiquity of their vocation, it will probably date back as far as the innkeeper's. When people began to move about from place to place—an indication of growing civilization—there was the pedlar who walked; then the bagman who took his bags containing samples on horseback, when roads were both rough and unsafe; then the solitary driver of the gig, when wheel conveyances could go on the smoother highways; and now, to-day, there are,

according to statistics, forty thousand of these gentlemen carrying huge packages, who make their journey by railway, many of whom still echo the sentiments of Shenstone, the Doric bard :—

Whoe'er has travelled life's dull round,
Where'er his stages may have been,
Will sigh to think he still has found
The warmest welcome at an inn.

ANNE CLIFFORD, COUNTESS OF PEMBROKE.

BY GEO. WATSON.

*(Read at Penrith.)**

PROMINENT amongst the relics of the past, on the south bank of the Eamont, stands the hoary pile of Brougham Castle, so picturesque an object in the magnificent landscape, viewed from the Beacon side. For hundreds of years it was one of the seats of the Cliffords, the last of whom was the Lady Anne Clifford, whose life and illustrious lineage I have asked you to consider for an hour this evening.

Those who heard my paper last year on "Cicely Neville, and the Feudal Lords of Penrith," may perhaps remember our notice of the deadly feud between the second family of Ralph Neville, Earl of Westmorland, and the Cliffords. We saw that after Ralph Neville's youngest daughter, Cicely, the Rose of Raby, was married to Richard Plantagenet, Duke of York, the claimant to the throne, her branch of the Neville family became leading champions of her husband's cause in the terrible Wars of the Roses, in which they came into frequent deadly conflict with the Cliffords, who fought on the opposing Lancastrian side. We saw that so bitter and sanguinary was the strife, that ere the Duchess Cicely died in religious seclusion in her castle, not only the House of Lancaster, for which the Cliffords bled, but her own House of York, had not a male left (except an imbecile youth, a prisoner in the Tower of London, shortly to be executed on Tower Hill); the only female

(* Inserted by the Penrith Society, by virtue of Rule 8.)

representative of the Plantagenets being Margaret of York, Cicely's grand-daughter, consort to the Tudor King Henry VII.

But two generations later we see the Duchess Cicely's illustrious descendant by the female line, the great Queen Elizabeth, carried to the tomb; ladies of the highest rank support the pall, and a little maid of thirteen—daughter and niece to two of them—looks on with awe-stricken face; and as we note that this fair girl is, ere she dies, to be the last of the Cliffords, we ask, where now is the deadly hate of Plantagenets and Cliffords?

This high-born little lady was Anne, daughter, and sole heir of George Clifford, third Earl of Cumberland, who had then been dead some three years. Her mother was the Lady Margaret Russell, a lady of illustrious family, and, by universal assent, of surprising virtues. Anne Clifford was born at Skipton Castle, one of the family seats, in 1590, but was taken early to London and placed under the care of her aunt, the Countess of Warwick, to be trained in courtly manners at Queen Elizabeth's court, the Countess being then principal lady of the bedchamber, and chief royal favourite. For tutor, Anne had the learned and good poet and writer, Daniel, whose memory she never ceased to venerate.

In her after-lifetime, at great cost, she caused all available ancient records to be collected and copied, and left behind her voluminous records of her ancestors, together with memorials of her own life, contained in a minute diary.

In this diary, writing at the age of sixty-three, the Countess gives us this description of herself as a girl:—"I was very happy in my first constitution, both in my mind and body, both for internal and external endowments: for never was there a child more equally resembling both father and mother than myself. The colour of mine eyes was black, like my father, and the form and aspect of them was quick and lively, like my mother's; the hair of my head was brown, and very thick, and so long that it reached to the calf of my legs when I stood upright, with a peak of hair on my forehead and a dimple on my chin, like my father's; full cheek'd and round faced like my mother, and an exquisite shape of body resembling my father; but now time and age hath

long since ended all those beauties, which are to be compared to the grass of the field, as Isaiah c. 40, v. 6, 7, 8. 'The voice said, Cry. And he said, What shall I cry? All flesh is grass, and all the goodness thereof as the flower of the field: the grass withereth, the flower thereof fadeth: because the spirit of the Lord bloweth upon it: surely the people is grass. The grass withereth, the flower fadeth: but the word of our God shall stand for ever.'

Leaving this charming young lady in charge of her courtly aunt and learned tutor, we will take our leave of her for the present, and, with her ancient records before us, make a sort of historical, biographical steeplechase, from William the Conqueror to James I., for of course no ancestors are much worth claiming who do not begin with the conquering William.

First we are introduced to a famous Robert Vetricont, whose grandfather came over with the Conqueror; and this Robert, we are told, was a great friend and favourite of King John, and by reason of the royal favour, by his own great abilities and force of character, and last—though not least—by his marriage with a great heiress, Idonea, he became a man of immense power and renown. King John gave him large possessions in Westmorland, creating him baron, and sheriff of that county. These possessions, comprising the castles of Brougham, Brough, Pendragon, and Appleby, together with the sheriffdom of Westmorland, were made hereditary to his heirs without the usual limitation to the male sex, so that female descendants could and did assert their right to act as sheriff.

The great Vetricont, however, was evidently not a new comer to the north, for his mother was Maud Moriville of Kirkoswald, who in her widowhood lived at Meaburn—known to this day as *Mauds* Meaburn. Her rents were paid in corn and victuals, which she insisted upon being commuted into a money payment; this, the record says, was done "after much ado;" by which we may understand that the Meaburn copyholders went on strike—but the lady got her way.

Besides being sheriff of Westmorland, Vetricont was sheriff of

four other counties, custodian of Windsor and other castles, and one of the judges of the land.

Our townsmen rejoicing in the name of Vipond—for it is the same name—can therefore claim a very great ancestor.

A curious phase of life is recorded of Vetripont's time, he became liable to the King for a fine of a hundred marks by reason of the marriage of the widow of Hugh Hastings, who held the manor of Crosby Ravensworth under him; but the King excused the fine, perhaps considering that although it might be law it was not reason, to expect Vetripont to prevent a widow marrying again if she had so determined.

Succeeding Robert Vetripont, we find his son John selling off considerable portions of the land of his barony, thereby founding some of the now ancient families of Westmorland. Here is an item for the antiquarians from the records:—"His tenants of Kirkbythore and other places were acquitted of the" (unfortunately the word or phrase is left blank in the copy, the original having been defaced or unintelligible) . . . "when they did belong to the Forests of Oglebirds, alias Whinfell, which it seems was a great servitude in those days.

"This seal of arms is yet" (Countess of Pembroke's time) "extant in wax, the impression being a man on horseback bearing a shield charged with *annulets*, also his horse trapped with these arms of the annulets, being the proper arms of the family of Vetriponts.

"And it is to be noted the greatest of the gentry in Westmorland who held their lands from him and his father, hath their coat of arms charged with the like annulets, though differing in one colour from another, and in the manner of setting them on their coats."

Then follows another Robert, a great warrior, slain fighting against the King in one of the battles between Henry III. and his barons. He left only two daughters as his co-heiresses—Isabella, ten years old, and Idonea, twelve months.

Robert was the last of the Vetriponts, and with him had nearly ended his family's connection with Westmorland; for the King

seized his estates, which, however, he afterwards restored to the daughters, assigning them as wards to two of his own faithful adherents: Isabella to Roger de Clifford, and Idonea to Roger de Leyburn; and both guardians thought they could best fulfil their delicate charge by marrying their respective wards, as no doubt the King had intended.

Roger de Clifford had to wait only four or five years for his ward reaching the then marriageable age of fifteen; but the other Roger (like Jacob of old) had to wait twice seven years, for his wife had to grow up from babyhood; but grow up she did, and was married to Roger Leyburn, who, with her, got one half of her family possessions, including the castles of Brough and Pendragon. Idonea outlived her Roger, got another husband and outlived him, and, dying at the age of eighty-six without issue, her half of the Vetricont estates came to the grandson of her sister Isabella.

And now, having reached the end of the Vetriconts, let us see where Isabella's Roger de Clifford came from. Of course we must go back to the inevitable Conqueror, in whose army came a soldier of fortune, Richard Fitz Pune, grandson of the Duke of Normandy. This Richard Fitz Pune had a son Walter, who married an heiress, Margaret Poxey, and with her got the castle and lands of Clifford in Herefordshire, when he assumed the name of De Clifford, and dropped the old Norman name Fitz Pune. His son, the second Lord Clifford, was also a Walter; he was father of that surpassing beauty of her age, Fair Rosamond.

The third Lord Clifford left no son, only a daughter Maud, who succeeded to the Clifford estates, whilst her father's younger brother, Roger de Clifford, took an estate in Worcestershire. He also had a son Roger, and as father and son were contemporaries, and were both active men in the wars of their time, they were known as Roger the Elder and Roger the Younger respectively; and it was the younger Roger to whom fell as ward and wife the Vetricont coheiress Isabella, she at her marriage being fifteen years old, and Roger thirty-four. This was in 1269.

For services in the wars of France, Ireland, and England, Henry III. granted Roger valuable possessions and honours in

the vale of Monmouth; so that he came into Westmorland not quite empty-handed. These Monmouth estates were afterwards exchanged with Edward II. by the next succeeding Clifford, for the Skipton Castle estates, in Yorkshire, which remain to this time part of the Clifford possessions. This Roger, the Countess of Pembroke tells us, built and repaired much of Brougham Castle, and caused a stone to be set in the wall thereof, over the door of the inward gate, whereon is engraven these words, following as they stand—

T H Y S
M A D E
R O G E R

which words, she goes on to say, “are severally interpreted: for some think he meant it, because he built that and a great part of the said castle, and also the great tower there; and some think he meant it, because he was made in his fortune by his marriage with Isabella Vetripont, by whom he became possessor of this castle and lands.”

This famous inscription stone is undoubtedly the one now there, but instead of being over the inward gateway, as the Countess describes it, it is over the outer gate, where it was put about fifty years ago, after having been a long time lost, and recovered in the mill-dam close by. As regards the inscription itself, a curious misunderstanding has arisen. The first edition of Walker’s *History of Penrith* gives it the same as the Countess of Pembroke, “*This made Roger* ;” but in the second edition it stands, “*Thus made Roger*,” for which in a foot note the author gives this reason:—“Shortly after the first edition of this work appeared, Mr. William Docker of Newby, in a letter to the *Penrith Advertiser*, stated that the inscription which he had examined was not ‘*This*,’ but ‘*Thus made Roger*.’ I immediately went and examined it, and was convinced he was correct; but to make the matter more certain, I requested Mr. Jacob Thompson to look at it when passing; he did so, and confirmed Mr. Docker.”

But the fact is, the author and his two friends failed to observe

that the first word is spelled as it generally was in the middle ages, "thys," but the body of the *y* fills the space like a *u*, while the tail of the *y* is squeezed in below, and not at first sight very apparent, and this led them to conclude erroneously that the word is *thus*. I shall have to refer to this inscription again in connection with another Roger.

1283. Roger Clifford was slain in battle in the Isle of Anglesey in the forty-seventh year of his age, leaving Isabella a widow of twenty-nine, with an only child, Robert, then nine years of age, who in due time became a man of war. He was fiercely engaged in the Scotch wars, and was slain in 1314, at Bannockburn or at Stirling, when about forty years of age, and was buried at Shap Abbey, where many Lords of Westmorland before and after him were laid. He built a great part of Skipton Castle, and made it very strong and beautiful—all of which was destroyed by Cromwell's soldiers in 1649.

Following him comes his eldest son, another Roger, in 1314, who had a short but eventful life of eight years of manhood. He took up arms with other nobles against King Edward II.; his party was overthrown, several of his colleagues were beheaded, but Roger was so desperately wounded as to be reckoned a dead man, and was spared from the scaffold; he was however attainted of treason, and his estate seized; but this was afterwards restored to him.

His ferocity and obstinacy are preserved in the story, that on being served with a writ from the king, he at the point of the sword forced the man who served it to eat the great wax seal attached to it, to show his contempt for the king's displeasure. He was never married, and was the hero of the romance of impropriety perpetuated in the name of the farmstead—Julian Bower—on Whinfell, in which figures another Fair Rosamond, whose name was Julia, and a secret bower, but minus the silken cord and the bowl of poison.

Roger died at thirty years of age, and was succeeded by his younger brother, Robert, a model lord and home-loving country gentleman, fond of the chase; and a great builder and repairer of his castles. To him came, in 1333, Baliol, King of Scotland, on a

visit to Brougham Castle, when the famous stag hunt took place in which a noble hound named Hercules pursued a fine hart from Whinfell to the borders of Scotland, and back to Whinfell. The hart giving its last desperate leap over a wall, cleared it, and fell dead; the noble hound failed to leap the wall, and fell dead on the other side. The hart's horns were nailed to a tree hard by, where in course of time they became embedded in the growing wood, and were in existence three hundred years after, the tree being known long after that as the "Hart's-horn tree."

The records significantly tell us that this Robert Clifford died in his bed; though his father and grandfather were both slain in the wars, and so were many of the Lord Cliffords after him.

This peaceful Clifford was succeeded by his eldest son Robert, in whom blazed out afresh all the military fire of his race. He was in the French wars under Edward III. and the Black Prince; was at the battle of Cressey when only sixteen, at the battle of Poitiers when twenty-five, and perished in the French wars at thirty-two, in the year 1364.

Then we have another and the last Roger, second brother of the last-named Robert. The records tell us as a remarkable thing, that this Roger actually lived to be a grandfather; and considering how rapidly lords were killed off in those days, it certainly was a curious fact. We are also told that "he was counted to be one of the wisest and gallantest men of all the Cliffords of his race, which wisdom of his was shown in keeping himself free from troubles in those troublesome times." Shall we not say of him, Well done Roger! He it was who obtained from the king the charter for Kirkby Stephen Market; yet he was by no means a "peace at any price" man, but bravely took his part in the king's battles when called upon, both in France and Scotland; but fighting was with him a duty, not a passion. He was a great builder, and the record says, built the greater part of Brougham Castle *next the east*; and I almost think it is an open question whether he is not the Roger of the inscription stone instead of the first Roger. No doubt it is now upon the gateway of the eastern part built by the last Roger, and the character of the letters appears to me to belong to his

period, rather than to that of a century earlier. His wife was Maud Beauchamp, who survived him many years, living at Brougham Castle as her jointure house, which the record says she greatly enlarged and repaired, and made there "Maud's Pool." I do not know whether any reminiscence of the name of "Maud's Pool" remains in the popular folk-lore, but the pool itself is to my eye quite apparent on the west side of the castle. It was, I think, an artificial canal from the river Lowther, above the confluence of the rivers, to the Eamont on the north side of the castle. The canal was widened out in the middle of its length with an island left in the centre. It would be quite a pretty piece of landscape-gardening, and not for purposes of defence.

The wise and prudent Roger, like many other good fathers, had a hair-brained, wild eldest son. His name was Thomas, and for some undefined reason he was banished by the Parliament from the Court, and prohibited from serving the king. So by way of working off his superfluous energies, he joined some sort of French crusade against the then barbarous tribes of Germany, where he was slain in the year 1393, in his twenty-eighth year. He survived his good father only two years, and he left a son John, three years of age, who, in due time, married and got killed, as was usual with the race. His wife was Elizabeth Percy, daughter of Hotspur. John fell in the French war, when he was thirty-four years old, leaving a son Thomas, seven years of age. His widow married Ralph Neville, son of Ralph Neville of Raby Castle, and lord of Penrith manor.

The words of the record about this lady are noteworthy : it says, "This Elizabeth Percy was one of the greatest women of her time, both for her birth and her marriages ; but the misfortunes of the wars so followed her, that in her time her grandfather, the Earl of Northumberland, was beheaded, and his son, her father, slain in battle ; her first husband slain in France ; and, after her decease, was her son Thomas, Lord Clifford, and her son John, Lord Neville, and her grandson John, Lord Clifford, all slain in battle." Elizabeth was buried in Staindrop Church, near Raby Castle.

The young Clifford, Thomas, son of John by his wife

Elizabeth Percy, went early to the French wars, where he was a distinguished commander. He and his men took the strong town of Ponthoise. One snowy night, they clad themselves in white, and surprised and took the town. After much service in France, he returned to England, and fought in the terrible Wars of the Roses, he fell at the first battle of St. Albans, fighting for the Lancastrians. His son John, then only twenty years of age, being fiercely engaged in the same cause. This John occupies an unenviable niche in history for his cold-blooded murder of the young Earl of Rutland, Edmond, son of the Duke of York and his Duchess Cicely Neville. The incident, though well known, is so closely connected with my subject that it cannot well be omitted.

After the disastrous battle of Wakefield, in which the Duke of York and the Earl of Salisbury (the Duchess Cicely's brother) were overcome and slain, the youth Edmond, sixteen years of age, was captured, and taken to Clifford, who, while the poor youth begged on his knees for mercy, exclaimed, "Thy father slew mine, and I will slay thee!" and stabbed him to death.

The Countess of Pembroke disputes this, the accepted version of the story, and thinks he must have been killed in battle; but the youth of Edmond, and the well-accredited chronicles of the time, would appear to make the blacker version of the story incontestible. The brutal Clifford was himself slain three months after, in the battle of Towton,* when the Lancastrian cause was crushed, and the House of York put in possession of the throne.

This bad Lord Clifford left a widow, Margaret, daughter and heiress of Henry, Lord Bromflete Baron Vescey (she bringing that title into the Clifford family), and upon her and her two sons of tender years fell heavily the vengeance of the triumphant Yorkists. They were attainted, their possessions seized, and the two boys sought for their destruction, so implacable was the fury of the victors.

Their mother got them away to the east coast, and shipped them for the Low Countries; but only the younger was sent; the

* At Dintingdale, just before the battle of Towton,

elder, Henry, being secretly brought back as the child of a shepherd, and remained at Londesborough amongst the shepherds as one of their children, until the widowed mother married the good Sir Launcelot Threlkeld, of Threlkeld and Yanwath Hall, when he was brought to Sir Launcelot's estate at Threlkeld, and lived the hardy life of a shepherd on the sides of Blencathara and Carrock; but even there he was not thought safe, for Cumberland and Westmorland were dominated by the cruel and implacable Richard, Duke of Gloucester. Penrith Castle was one of Richard's places of residence, and he was believed to be still thirsting for the blood of the children of his brother's murderer. So Henry was again moved: this time to the border of Scotland, where he continued to live, in no way distinguished from the other shepherds. It is said he was ignorant of his own identity, and was not taught to read or write, lest it should betray his condition.

Then, after twenty-four years of shepherd life, the House of York, by violent or untimely death, is extinct; the new dynasty of the Tudors reigns, and Henry VII. restores him to his wide possessions and honours. Wordsworth's beautiful poem on the subject is well known.

In Henry, the shepherd-lord, the military fire of his ancestors was extinct. He must have attained some degree of education after his restoration, for the Countess of Pembroke tells us, "He did exceedingly delight in astronomy and the contemplation of the stars, which it is likely he was seasoned (trained) in during the course of his shepherd's life. He built a great part of Barden Tower, where he lived much, because in that place he had furnished himself with instruments for that study." She adds, "He was a plain man, and lived for the most part a country life, and came seldom to court or London; but when he was called thither to sit a Peer of the Realm, he behaved himself wisely and like a good English gentleman."

The shepherd-lord's astronomy, it appears, took the dubious form of astrology, for the Countess says that, "in her time there was a tradition, that by his skill in astronomy, he, on the birth of his grandson, read the stars, and foretold that his grandson should

have two sons, between whom and their posterity there should be great suits at law, and that the heirs male of the line should end with those two sons, or soon after them," which—stars or no stars—actually came to pass.

The shepherd-lord was twice married, to ladies of good families, and left one son and several daughters. His daughter Dorothy married Hugh Lowther of Lowther, a sort of cousin, he being son of Anne Threlkeld's daughter, and, it would appear, heiress of Sir Launcelot and his wife, the widow of John Clifford.

The good Lord Clifford died in 1523, at the age of seventy, and was followed by his son Henry, a contemporary of King Henry VIII., between whom and himself as boys and men, a close friendship ever existed—as a result of which the King created him Earl of Cumberland. He died in 1542. His son, also Henry, when young and at the court of Henry VIII., married Lady Eleanor Brandon, niece to the King, and granddaughter to Henry VII. The marriage was the occasion of extraordinary magnificence, the King himself being present.

In preparation for the reception of so regal a bride in the north, the bridegroom's father caused an extensive and magnificent addition to be built to Skipton Castle—begun and completed in three months.

This great lady lived only about ten years a wife, and died at Brougham Castle in 1547, leaving an only daughter.

Immediately after the death of his wife, Henry Clifford, then second Earl of Cumberland, being thirty years old, had an illness so serious that he was believed to be dead, and was laid out in state under a crimson velvet hearse or pall. The men who watched by him thinking they saw some signs of life, threw off the trappings of death, carried him back to his bed, and applied restoratives with such success that he was restored to life, but life so feeble that he had to be fed literally as a new born child for five weeks, and afterwards for several months he drank only ass's milk. He however recovered perfect health, and married as his second wife Ann, daughter of Lord Dacres of Greystoke, Gilsland, and Kirkoswald. They were married at Kirkoswald Castle.

Much quieter would this Kirkoswald wedding be than his first grand marriage before King Henry and his court, and a much quieter person must have been his second bride, for we are told she never in her life was in London, or any way near it ; evidently Ann Dacres was a lover of her own "north countrie."

"Henry," says the record, "was much addicted to the study and practice of chemistry and alchemy ; a great distiller of waters and maker of chemical extractions, and very studious in all manner of learning ; he had an excellent library of books, both hand-written books and printed, to which he was addicted exceedingly, especially towards his latter end."

Now, as he died at Brougham Castle, it is fair to infer that these pursuits of his latter days were followed in that castle ; and, if so, the venerable pile which we are accustomed to associate only with deeds of warfare, was once in its day a seat of literature and science. He died at Brougham Castle in 1570, and left two sons, George and Francis, and thus far the alleged astrological forecast of his grandfather, the shepherd-lord, was fulfilled.

The eldest son, George, third Earl of Cumberland, was father of Anne Clifford, Countess of Pembroke. He was born at Brougham Castle in 1558, three months before the death of Queen Mary, and he married, as before mentioned, Lady Margaret Russell.

We have seen that the long line of Cliffords were men of mark, ever in front of the leading events of their times, and this George was no exception. The mediæval form of chivalry had passed away with feudalism, but the spirit of chivalry was now more needed than ever ; not in the conflict of dynasties for the throne, but in national defence and supremacy. The man who, in Elizabeth's reign, would win renown, had to seek it in the wide paths of learning, of commerce, or of naval heroism ; for it was the birth-time of English supremacy on the ocean, as well as of English colonization, and there arose the new passion for foreign voyaging, and to this George, Earl of Cumberland, gave himself and his wealth without reserve. In his education he had made but little progress, except in mathematics, to which he applied himself eagerly, and to this taste he owed his proficiency in navigation. His ancestors had

expended their means in building castles and in paying soldiers ; but he built ships and paid sailors, and that to such an extent that he had to sell off considerable estates. He made some eleven or twelve voyages, most of them to the least-known parts of the world ; some of his voyages were privateering expeditions, organized to harass and plunder the ships of arrogant and menacing Spain. Occasionally he inflicted some damage upon the national enemy, but seldom did any good to himself. For one exploit, however, he deserves renown ; he commanded one of the Queen's ships, the *Bonaventain*, in the world-famous little fleet that encountered and vanquished the stupendous Spanish Armada ; and it is no small thing for the Earl of Cumberland's fame, that his name stands in the nation's archives with those of Drake, Fenner, Hawkins, Fenton, Seymore, Southwell, Raleigh, and Frobisher.

But he was a prominent man at court as well as at sea, and foremost in all the gay and brilliant pursuits of high life ; and to his enormous expenses for his sea expeditions he added unbounded extravagance ashore. He was a great favourite with Queen Elizabeth, as indeed handsome gentlemen were wont to be. She appointed him her champion at her tiltings and court pageanties, on which occasions he wore a magnificent suit of armour inlaid with gold. This armour is now at Appleby Castle.

On one occasion the coquetish Queen dropped her glove for him to pick up, and when he presented it to her on his knees, she gave it to him to keep for her sake. He had it covered with jewels, and wore it on state occasions in front of his hat.

But George, Earl of Cumberland, though a brilliant man before the public, was a bad husband and father : his neglect, tyranny, and scandalous immorality, caused a separation between himself and his high-souled and saintly Countess. His final act of tyranny was to leave a will disinheriting his daughter, leaving her a sum of money and bequeathing all the possessions of the Vetriponts and Cliffords to his brother Francis, who properly could succeed only to the title of Earl of Cumberland.

Anne Clifford loved and venerated her mother almost to idolatry, and although in all her voluminous writing she pens no word of

bitterness against her father, she must have found in his case the keeping of the fifth commandment a most perplexing duty.

After the earl's death (Anne being about sixteen years old) his widow commenced, on the part of her disinherited daughter, an action at law to set aside the earl's iniquitous will. It was argued that the Vetripont estates and honours were by the original royal grant to descend to the heirs, whether male or female, in the direct line, so long as there was an heir, and to go to a second son only if there was neither son nor daughter. In this view, Anne's father left an illegal will; and with this law-suit commenced the fulfilment of the second part of the shepherd-lord's prediction.

Mother and daughter, to maintain their claim, came to the north and stayed some time at Appleby and Brougham castles; but on presenting themselves at Skipton Castle, they found the doors barred against them, and the uncle's agents in possession; they then returned to London to prosecute their claims.

In 1609, at the age of eighteen, Anne Clifford was married to Richard Sackville, Lord Buckhurst, son of the Earl of Dorset, who, however, only two days after, by the sudden death of his father, became Earl of Dorset.

Anne's husband was a great courtier, and a man of accomplishments and learning, but of unbounded extravagance; and he soon showed himself an unkind and tyrannical husband. He co-operated with King James in the endeavour to compel his wife to agree to her disinheritance. Twice Anne was taken before the King, and urged to yield her claims; but though king and husband coerced, the brave Anne held out.

The Countess, her good mother, was still in possession in Westmorland, and residing at Brougham Castle; and in 1616 Anne having been then married some seven years, came from her house at Knowle, to visit her mother at Brougham Castle for a month. Anne thus describes their parting:—"It was the last time that ever mother and daughter saw one another, for that day, about a quarter of a mile from Brougham Castle, in the open air, they took their last leave one of another, with many tears and much grief,

the mother returning to the castle, and the daughter to her husband's house at Knowle in Kent."

The mother died about a month after, on the 24th day of May, 1616. The spot where she parted from her venerated mother was ever sacred to the loving daughter; and forty years after she consecrated it by erecting there the well-known "Countess Pillar," near Brougham Castle, on the Appleby road side.

Shortly after the mother's death, King James procured an order from four judges against Anne; her husband signed away his claim on her estates, and royal letters patent were issued completing her disinheritance; and immediately after the usurping lord (as Anne always regarded him) entertained King James for three days at Brougham Castle.

Anne Clifford, Countess of Dorset, after thirteen years of unhappy married life, found herself a widow. She had had three sons, who died in their infancy, but two daughters remained.

Six years after she married Philip Herbert, Earl of Pembroke and Montgomery; and in this marriage she was even more unfortunate than in the first. Her husband was son of the talented and high-souled Mary Sydney, Countess of Pembroke, sister of the accomplished writer and heroic soldier, Sir Philip Sydney; but none of the rare graces of mother and uncle were found in Anne's new husband. Walpole called him a memorable simpleton; in private life he was contemptible and vicious; he was grossly illiterate, but highly learned in matters pertaining to horses, dogs, and hawks, beyond which his soul did not aspire. He was, however, a great favourite with King James, who gave him £18,000 a year for the benefit of his splendid talents in attending to his stables and kennels.

To show of what kind of stuff kings and courtiers were made at that time, take this incident. William, Earl of Pembroke (elder brother of Anne Clifford's husband) had an antipathy to a frog; King James, with his usual school-boy silliness, threw one into his neck, in requital whereof the earl caused a pig, to which the king had a disgust, to be placed in his bed-room. This happened at Wilton, under the earl's own roof, and affected King James more

as a breach of hospitality, than as an affront to his Majesty's person.

After enduring the brutality of her second husband for twenty years, she was obliged to part from him entirely. He died in 1650. Her family consisted only of two daughters by her first husband. The elder married the Earl of Thanet, the head of the ancient family of Tufton of Kent; and the younger daughter was married to the Earl of Northampton.

It is somewhat singular that a woman so high-minded, religious, and discerning, should have made two such unhappy marriages. Anne was indeed ill-fated in her male connections, in having had a bad father and two bad husbands. But indeed good men were not very plentiful at that period. She was second wife to both husbands. It is pleasant to observe how she endeavours to make the best of her bad bargains, and how she endeavours to say a little against them as possible. Of her married life she thus writes:—"I must confess with unexpressible thankfulness, that though through the goodness of the Almighty God and the merrets of my Saviour, Christ Jesus, Redeemer of the World, I was born a happy creature in Mind, Body, and Fortune, and that these two Lords of Mine to whom I was after-wards by God's Providence married, were in their several kinds worthy Noblemen as any in this Kingdom, yet it was my misfortune to have contradictions and crosses with them both: with my first Lord, about the desire he had to make me sell my rights in the Lands of my Auncient Inheritance for money, which I never did nor ever would consent unto, insomuch as this matter was the cause of a Long contention betwixt us, as also for his perfuseness in Consuming his Estate, and some other extravagances of his. And with my second Lord, because my youngest Daughter, the Lady Isabella Sackville, would not be brought to marry one of his younger sons, and that I would not be brought to relinquish my Interest that I had in five thousand pounds, being part of her portion out of my lands in Craven; nor did I want divers Malicious ill-willers to blow and foment to Coals of dissention betwixt us: so as in both their lifetimes the marble Pillars of Knowle in Kent, and Wilton in Wilt-

shire, were to me oftentimes but the Gay Harbours of Anguish, insomuch as a wise man that knew the Insides of my Fortunes would often say, that I lived in both my Lords' great families as the River of Roan (or Rhodamus) runs thro' the Lake of Geneva—without mingling any part of its streams with the Lake; for I gave myself wholly to Retiredness (as much as I could) in both these great Familys, and made good books and virtuous thoughts my study and companions, which can never deserve affliction nor be daunted where it unjustly happens, and by a Happy Genious I overcame all these troubles."

In 1643, thirteen years after her marriage to the Earl of Pembroke, her cousin, the last usurper of her inheritance, died, and although King James and his judges had pronounced her disinherittance, a Greater Disposer of events had issued a more potent edict, and her cousin, the fifth Earl of Cumberland, although he had had seven sons, died without a male heir, and the inheritance that had been wrested from her came back to her indisputably. The male line of the Cliffords was now extinct, and the shepherd-lord's prediction completed.

In 1649, a year before her husband's death, the Countess of Pembroke came to the north and took possession of her estates: she leaves London July 11th, arrives at Skipton on the 18th, Barden Tower on the 28th, Appleby Castle August 8th, Brougham Castle on the 18th.

The civil war between King and Parliament had then been raging for some time, and she finds her castles more or less demolished, and the churches ruined and desecrated by Cromwell's soldiers; so she sets to work with extraordinary energy and determination to repair and reinstate; her friends advise her to desist, as Cromwell would be very likely to pull them down again, but she replies, "Let him destroy my castles if he will, and as often as he levels them I will rebuild them, so long as he leaves me a shilling in my pocket.

Then there were manor courts to be held, to reclaim rights and correct abuses; boundaries to be ridden, and a general putting to rights of nearly all Westmorland and a part of Yorkshire—for

the effect of thirty years of neglect had to be remedied : and all this was the work of many years, and for a woman of sixty was indeed a Herculean labour.

Her castles of Skipton, Pendragon, Brough, Appleby, Brougham, and Barden Tower, and some seven churches, were repaired or entirely rebuilt, and a commemorative inscription placed upon each, always ending with *Laus Deo*.

She also built and endowed the St. Ann's Almshouses at Appleby for twelve poor women ; she built the bridge at Appleby, and endowed, with land at Templesowerby, a trust for the repair of the bridge, the church, and the grammar school in that town.

The Countess found her manorial rights, from long abeyance, all but lost, and she was obliged to institute a series of lawsuits before she got her affairs placed upon a proper basis. An amusing incident in these suits was the disputed payment of the boon hen, claimed in addition to certain rents. Her opponent was a retired clothier from Halifax, Mr. Murgatroyd, who positively refused the Countess her hen. But the woman who had held her own against king, judges, and husbands, was not likely to give in to a Halifax clothier. A suit at law won the lady the hen, and it was paid, whereupon the Countess invited the clothier to dinner, when, lo ! the first dish served was the hen ! and as the hostess helped him to a good plateful, she said, "Come, Mr. Murgatroyd, let us now be friends ; since your hen is served at my table, I will give you half."

The Countess never revisited London, and after the Restoration she was as much disgusted with the profligacy of the court, as she had been with the rule of Cromwell ; and when pressed to go to court, she answered, "By no means, unless I may be allowed to wear blinkers !"

Her powers of self-assertion—always, as we have seen, of the first order—certainly did not wane in her age ; and when Sir Joseph Williamson, secretary to Charles II., wrote dictating a Member of Parliament for Appleby, she replied, "I have been bullied by a usurper, and neglected by a court, but I will not be dictated to by a subject. Your man shan't stand."

She resided at all her castles in turn, changing from one to another in great state in her coach and six, followed by a train of servants; and at each place of residence the local clergyman attended daily as her chaplain. Brougham Castle is always mentioned in her journal with especial reverence, and the chamber in which she slept, as "the chamber in which my noble Father was born, and my beloved Mother died."

In the voluminous manuscript memorial of her life, and in her day-book, she gives the events of every day of her life, minutely recorded in the wordy but dignified style of the period. I will here give a few entries:—"And the 23rd day of the said April, 1651, I was present at the laying of the first foundation stone of my Hospital or Alms House here in Appleby Town, for which I purchased land, viz., the Manor of Brougham, the fourth day of February following, and the Lands called St. Nicholas near Appleby the 29th day of December, 1652, which Alnshouse was quite finished and the Mother and twelve Sisters in it in January and March, 1653.

"And this summer, 1651, Major General Thomas Harrison came hither with his forces, for then the warr was hott in Scotland, so as then many places in Westmorland, and especially my castle of Appleby, was full of soldiers, who lay here a great part of the Summer; but I thank God I received no harm or Damage by them nor by the King or his party who that August came into England, and within six or seven miles of Appleby Castle, though they came not to it. And that Christmas I kept in Appleby Castle, as I had done the Christmas before at Skipton.

"And in this settled aboad of mine in these ancient Houses of mine Inheritance, Appleby Castle and Brougham Castle in Westmoreland, and Skipton Castle or House in Craven, I do more and more fall in love with the contentment and Inocent pleasures of a Country Life, which humor of mine I do wish with all my heart (if it be the will of Almighty God), may be confer'd on my Posterity, that are to be secured me in these Places, for a wise body ought to make their own home the Place of Self Fruition and the comfortable part of their Life; but this must be left to a

succeeding Providence, for none can know what shall come after them ; but to invite them to it, that saying in the 16 Psa. v. 5, 6, 7, and 8, may be fitly applied : ‘The Lord is the Portion of mine Inheritance and of my cup ; thou maintainest my lot. The lines are fallen unto me in pleasant places ; yea, I have a goodly heritage.’

“About the 10th of this March, 1655, while I lay in Appleby Castle, did I cause a great part of Appleby Church to be taken down, it being very ruinous and in Danger of falling of itself ; and so I caused a vault to be made in the North East Corner of the Church for myself to be buried in, if it please God. And the repairing of the said Church cost me about some 6 or 7 Hundred Pounds, being finished in the year following.

“This summer (1658), in the beginning of the Spring, did I cause Bongate Church, near Appleby, to be pulled down and new built up again at my own charge ; and it was wholly finished about the latter end of April, 1659 : for which God be praised. Psa. 116, v. 11, 12, 13.

“And the beginning of this summer (1659), a little before my coming out of Westmorland, did I cause the Church of Ninekirks to be pulled down and new built up again in the same place, larger and bigger than it was before, which finished the latter end of this summer, though myself and my family were then at my castle in Skipton in Craven. And this Church of Ninekirk would in all likelihood have fallen down, it was so ruinous, if it had not been repaired by me. Psa. 116.

“And about the said 4 August, 1659, was there a Garrison of foot soldiers put into Appleby Castle, into the great Tower there called Ceaser’s Tower, which I lately repaired. They went away, and after they were gone others came in their room, but stayed not long ; as likewise into Brougham Castle for a while ; both of which Castles these soldiers not long after quitted, and went away. Deut. c. 25, v.-5.

“And the 25th day of April, 1660, this year a new Parliament began to sit at Westminster, wherein were chosen, most part by my means, Knights of the shire of Westmorland, my two Cousins,

Sir Thomas Wharton and Sir John Lowther of Lowther, Knight and Baronett ; and for Burgesses of the Burrough of Appleby, my Cousin, Sir Henry Cholmsley, and Christopher Clapham, Esquire : which Parliament proved to be a happy Parliament, by calling in our rightfull Prince, King Charles the second, into England."

In this truly wonderful journal of hers, we have her personal doings, local incidents, and frequent national events, births and marriages of grand-children ; births of grand-children's babies are recorded minutely to the day und hour, and always to her "great and unspeakable comfort," and with a text from the Psalms appropriate to the occasion. Sometimes, too, we have deaths of grand-children, to her "great grief," with a text from Job or other suitable sacred writer. Then there are innumerable visits recorded of daughters- and sons-in-law, with their babies ; and, as time went on, of grandsons and granddaughters with their babies, all flocking to the throne of the venerable Countess, who writes down in her day-book, that when they came unto her, she "kissed them all with much joy and comfort."

And as we go through her pages, we note that while her eldest daughter's progeny, the Tuftons, increase and multiply exceedingly, those of her second daughter fade away, until in 1662 death has not left one to share with the Tuftons the immense wealth the aged dame will ere long leave behind her.

Another thing we note, that by her extraordinary memory and clear mind, she daily lives over again her early life. "I remember," she will say, "how this day was sixty years ; I went," etc., and then every minutiae is given as if it had been but yesterday. I will give a few short extracts from the last pages of her diary, written at Brougham Castle, commencing twelve days before her death :—

"March 10th, 1676. And this morning I saw George Gorgeion paid for 249 yards of linen cloth that he bought for me at Penrith, designed for 20 pairs of sheets and some pillow purses, and after dinner I gave away several old sheets amongst my servants, and this afternoon did Margaret Montgomery, from Penrith, the sempstress, come hither, so I had her into my chamber and kissed her, and talked with her ; she came to make up the 24 pair of sheets

and pillow purses. The 13th day—I remember how this day 60 years I went from my blessed Mother to Naworth Castle.” Then follow minute particulars of the visit and the people she met there, and adds, “I went not out all this day. Ps. 121.”

“15th day. I remember how this day was 60 years. In the morning I went out of Naworth Castle into the City of Carlisle,” and then follow details of her visiting Carlisle Castle and Cathedral and her return to her “blessed Mother” at Brougham Castle.

“17 day. No body came to dine, and I went not out all day.” 19th day, Sunday, she has a swooning fit, but recovered, and was better, and then “dined there in the painted room, Mr. Grasty, our Parson, and my two Farmers; so after dinner they came into my chamber, and Mr. Grasty said Common Prayers and read a chapter and sang a Psalm, as usual upon Sundays, to me and my family; and after prayer they all went away.”

The 20th day. This is two days before her death, and she is eighty-six years of age, she writes:—“I remember how this was 60 years; did I and my blessed Mother in Brougham Castle give in our answer in writing, that we would not stand to the award of the then four Lord Chief Judges meant to make concerning the lands of my inheritance, which did spin out a great deal of trouble to us; yet God turned it to the best. Deut. c. 23, v. 5. ‘Nevertheless the Lord thy God would not hearken unto Balaam; but the Lord thy God turned the curse into a blessing unto thee.’”

The 21st she writes only—“I went not out all day.” That was her last entry; next day, the 22nd, the hand of death is upon her, and on being asked how she did, uttered her last words, “I thank God I am very well.” *Laus Deo* was her motto in life, and *Laus Deo* was her watchword in death.

Again the six horses had a long retinue from Brougham Castle to Appleby, but this time they stop at the old parish church of St. Lawrence, and in the new tomb made there by her own directions, is laid, near the remains of her “blessed Mother,” all that is left of Anne Clifford, Countess of Pembroke.

On the death of the venerable Countess, the greater part of her immense possessions devolved upon her grandson Nicholas, Earl

of Thanet, who, however, enjoyed them only for three years, and, dying without issue, they passed to his brother John, who, by the death of his aunt, the second daughter of the Countess of Pembroke, without heirs, became possessed of the whole of the Vetricont and Clifford estates and titles.

In conclusion I will briefly notice the contrast between the histories of the two races of Clifford and Tufton. The name of Tufton comes from Tufton, a manor in the parish of Northiam in Sussex, held by the family in very early times; but they are soon found settled in the adjoining county of Kent, probably in the very usual way—by marrying an heiress possessed of lands in that county. Some of the family come into ecclesiastical history very early as benefactors to religious houses, whilst others appear in Kentish manorial records as only farmers and shepherds, paying rent charges in hens, eggs, and sheep—a result no doubt of the old Saxon land law so peculiar to Kent, called gavelkind, by which, on the death of a landowner, his estate was equally divided amongst his children; the effect of such a law being to create numerous peasant proprietors, and retard the growth of an aristocracy.

While the Tuftons were in this way struggling slowly out of obscurity, the Vetriconts and Cliffords were in full blaze of feudal glory, wasting blood and treasure in war for royal dynasties or foreign conquest. Once, it is true, we read of a Tufton in command of a battalion at the battle of Cressy, and laying siege to Calais; but, with this exception, we find the rising race of Tuftons steadily adding manor to manor by marriages with heiresses, getting rid of the poverty-creating tenure of gavelkind by Acts of Parliament; and finally, on the dissolution of the monasteries—by purchase or by royal favour—becoming owners of immense landed possessions, until in Henry VIII.'s time we find a Tufton seated at the old ecclesiastical manor of Hothfield, in Kent; a Tufton knighted in 1603, a baronet in 1611, and advanced to the first rank of aristocracy as Earl of Thanet, in 1628.

During all these centuries in which the Tuftons were rising to wealth and distinction, we have seen the very existence of the

great Vetriponts and Cliffords as a race often hanging by a thread: now on the chances of a single child arriving at manhood, and now on the contingency of a single man coming out alive from a deadly feudal conflict; and sometimes on the apparently hopeless chance of the reversal of attainter and confiscation; and at last, as we have seen, the illustrious line becoming extinct, and the Tuftons of Kent taking their place; and then, as an instance of the irony of fate—no sooner had they attained that social eminence, than they appeared to inherit their predecessors' mutability—four brothers succeeding in seven years, and all dying without direct heirs. The last of these brothers, Thomas, however enjoyed with great honour the estates and titles for fifty-nine years, but dying in 1742 without male heirs, the baronies of Clifford, Westmorland, and Vescey fell into abeyance. It was in his time that Brougham Castle was dismantled, and the oak timbers and lead sold; tradition says they were used in the re-building of Penrith Church, and the old notchings and mortices to be seen in the timbers of the roof and galleries appear to confirm the tradition.

THE BOTANY OF THE SOLWAY SHORE.

BY W. HODGSON, A.L.S.

(Read at Maryport.)

AT present the sea appears to be slowly but steadily encroaching upon the coast of West Cumberland. At Flimby this is quite marked, as it is also to the S. of Workington Harbour; and many plants that existed there within my own recollection have utterly disappeared. Of these I may mention in passing *Crambe maritima*, *Hordeum maritimum*, *Phleum arenarium*, *Scandix pecten-veneris*, *Euphorbia paralias*, *Hyoscyamus niger*, etc., all of which grew formerly along the beach between Maryport and Flimby. On the other hand, several casuals or waifs from cultivation have recently been detected growing upon heaps of household rubbish deposited on the beach between Risehow and the Senhouse Dock, Maryport. These last include several Crucifers, as *Rapistrum rugosum*, *Sisymbrium sophia*, *Brassica rapa*, *Thlaspi arvense*, *Lepidium draba*, and *Raphanus maritimus*. Other than Crucifers are *Saponaria vaccaria*, *Echinospermum lappula*, *Anagallis cœrulea*, *Lolium perenne*, v. *ramosum* (a giant type of ryegrass), *Anthemis cotula*, *Chrysanthemum coronarium*, and lastly *Asperugo procumbens*, which I gathered early in June of the present year (1886).

RANUNCULACEÆ.—*Thalictrum minus*, a. *maritimum*, the Vicar of Rosley assures me is found a little beyond Skinburness, towards the Grune Point. *Anemone nemorosa*, though not strictly a shore plant, yet occurs here and there but little removed from the beach.

Ranunculus drouettii and *R. baudotii*, forms of the Water Crowfoot, occur in the river Ellen, and in the stream that joins the Solway at Dubmill. *R. hederaceus* is found in most pools with a muddy bottom; our Maryport friends may find good examples in the brook just beyond Bank End. *R. sceleratus* is one of the rarest of the family; I have gathered this plant in the ditch by the roadside about a furlong west of Dubmill. *R. flammula* everywhere abounds in moist places from sea-level up to an altitude of 2000 feet. *R. lingua* is found in the "soughs" in the inland meadows a little to the south of Oldkilm farm, near Dubmill; this, the largest plant of the order, is rarely met with in Cumberland; other stations are, a brook by M. and C. Railway, near Curthwaite Station, on the north side of the line, towards Dalston; and the Moss at Newton Regny, near Penrith. *R. acris* is abundant, as are also the next two species, *R. repens* and *R. bulbosus*. *R. hirsutus*, on the contrary, is very rare; I find stray specimens sometimes by the roadside from the North Lodge, Allonby, travelling toward Dubmill. *R. ficaria* is known to almost everyone. *Caltha palustris*, in moist situations, more frequently met with inland than on the shore. *Trollius europæus*; impoverished specimens of this plant, which is generally a denizen of upland meadows and woodlands, are found sparingly in meadows near the beach.

NYPHÆACEÆ.—*Nuphar lutea*, in a "sough" on the Oldkilm farm, Dubmill, near Allonby.

PAPAVERACEÆ.—*Papaver dubium*; of common occurrence about rubbish heaps and the edges of railway embankments. *P. argemone*; less common than the last, and altogether smaller and less conspicuous; dry gravelly places are its favourite stations. *Glaucium luteum*; old botanical lists mark this plant as found on Flimby beach, where it no longer grows; I found a fine specimen behind the slag mounds at the mouth of the Derwent in August, 1885, and this year a number of plants may be seen at the same station.

FUMARIACEÆ.—*Fumaria confusa* may be seen close to Maryport; it grows on a hedgebank by the footpath along the railway between the turnpike bridge and the old reservoir. *F. officinalis*, a frequent

weed in green-crops ; a tenant of light sandy soils, such as about Crosscannonby, Old Mawbray, etc.

CRUCIFERÆ.—Of this order we may discover many examples of species seldom met with elsewhere. Three stations on the coast-line have each yielded a rich supply of Crucifers, Wild Mustards, Cabbages, Turnips, Radishes, Cresses, etc., viz., the north shore at Workington, sandy beach behind Risehow, and the ballast heaps at Silloth ; household rubbish deposited in heaps at Risehow has produced several plants during 1884 and 1885, some of which have no place in recognised lists of plants indigenous to Cumberland, or even to England ; and which, from their surroundings, one feels tempted to imagine have found their way thither among the sweepings of bird-cages, seeing that hemp and canary-grass spring up with them. At the Silloth and Workington stations several plants probably owe their introduction to the deposit of ballast from ships trading to those places. It is open to doubt whether many of such casuals will survive beyond a few seasons. It is certain that the bulk of the dozen exotic species found by me at Flossgate, on Ullswater, in 1881 and 1882, have already disappeared. Their chances were of the slenderest ; a bed of hard gravel affords but meagre support for plant life, and probably few of them were fully developed. All record of their existence might have perished, but for the mention of them made by Mr. J. G. Baker, F.R.S., in his recently published “Flora of the English Lake District.”

Returning to the Crucifers : *Cakile maritima* may be gathered at intervals along the entire coast line of Cumberland ; I saw some very fine examples on the north shore at Workington in August of 1885. *Crambe maritima* once grew in small patches at the edge of the Maryport bent hills, where it has long since been smothered by the unsightly mounds of refuse from the iron furnaces ; nowhere plentiful, it may yet be found occasionally to the south of our present limits,—Ravenglass and Coulderton are given as stations, the former by Mr. Wood, in the “Botanist’s Guide,” the latter by Mr. Dickinson, late of Thorncroft. *Raphanus raphanistrum* ; found at different points on the coast between Workington and

Risehow, also at Silloth: always, I think, the yellow-flowered type. *R. maritimus*; the only specimen I have seen in a growing state, was a fine plant which I discovered in August last (1885), on the north shore at Workington, behind the Lonsdale Dock. *Sinapis arvensis* grows on almost every rubbish heap. *S. alba*, on the rubbish at Risehow; once cultivated near Allonby; scarce. *S. nigra*, railway siding near the Baths, Silloth (1868). Neither of the two last-mentioned can fairly claim to be indigenous to Cumberland. *Brassica napus*; next to *Sinapis arvensis*, the commonest and most widely distributed of the charlocks. *B. rapa*, here and there along the shore, plentiful on the Furness Railway towards Coulderton. *B. monensis*, common along the coast; in some places peculiarly abundant, as at Silloth, Flimby, and about Siddick Junction. *Sisymbrium officinale*, another very common species about hedgerows, borders of cultivated fields, rubbish heaps, etc. *S. sophia*, on the ballast mounds about Silloth Dock (1868). *S. alliaria*, abundant near Maryport. *S. pannonicum*, a continental species of flix-weed, was observed lately growing in a patch of waste ground between the Railway Station at Maryport and the river Ellen. *Cardamine amara*, not strictly a shore plant, though sometimes seen in moist situations; in swampy inland woods it is frequent enough. *C. pratensis*, like the preceding, is an occupant of damp ground, edges of brooks, etc. *C. hirsuta*, on old walls, especially if damp; abundant. *Arabis thaliana*, on dry hedge-banks. *Barbarea vulgaris*, not unfrequent about rubbish heaps, especially where the soil has but recently been disturbed. *Nasturtium officinale*, in brooks, common; as at Bank End, near Maryport, and on St. Helen's farm, Workington. *N. terrestre* appears upon heaps of rubbish on the beach at Risehow, also upon the Maryport and Carlisle Railway, near Oughterside Mill. *Cochlearia officinalis*, on moist rocks about St. Bees, Parton, Harrington, etc. *C. anglica*, shore at St. Bees, and at Workington. *C. danica* has been recorded from Coulderton, and also from about Ravenglass; I noticed it myself several years ago a little to the south of Workington: but that station has disappeared, and is now quite submerged by the inroads of the sea. *Draba*

verna is frequent on dry gravelly beaches; about the Salt Pans, east of Bank End, large patches may be seen; one of our earliest flowering plants, diminutive in size. *D. incana* has been found near Seascale. *Camelina sativa*, in Cumberland regarded as a waif from cultivation; I have found it on the ballast heaps about Silloth, and two years ago it made its appearance in the garden belonging to Gill Bank College, Whitehaven, whence it was forwarded to me for identification, together with *Caucalis daucoides* and *Saponaria vaccaria*. *Thlaspi arvense*; I gathered a single plant of this species on the beach behind Risehow in August, 1884, the only example that I have met with in Cumberland. *Teesdalia nudicaulis*, I have seen growing on a dry hedge-bank near the village of Mawbray. *Capsella bursa-pastoris*; no weed of cultivation is more generally distributed than this species. *Lepidium smithii*, not unusually occurring on dry banks, and certainly a well-established native, while *L. draba*, the next plant in the Catalogue, is extremely rare; two or three plants grew among the rubbish heaps at Risehow, where also in 1884 I gathered a specimen of *Rapistrum rugosum*, a cruciferous plant not included in the London Catalogue, and therefore not to be classed among plants considered as indigenous to Britain.

RESEDACEÆ.—*Reseda luteola*, a common occupant of rubbish heaps; a few plants grow about the edges of the slag mounds at both Maryport and Workington. *R. lutea*, a much smaller plant, is found on the Furness Railway, near Braystones or Couderton.

VIOLACEÆ.—*Viola canina*; in all my botanical ramblings far or near I have nowhere seen such beautiful types of this flower as are to be met with during early summer near St. Helen's farm, or Siddick. *Viola tricolor*; grows by hundreds in patches among the sandhills along the shore to the south of St. Bees, especially in situations where the undergrowth of gorse and brambles has been removed by burning; the var. (b) *arvensis*, with small white or cream-tinted petals, may be gathered sparingly at intervals along the coast.

DROSERACEÆ.—*Drosera rotundifolia*, a plant more at home in

deep spongy bogs than on the sandy beach; it may be found in the Salta Moss, by Dubmill, and in Bowness Moss: at no great distance from the shore in either case.

POLYGALACEÆ.—*Polygala vulgaris*; this pretty flower may be gathered among the drier patches of vegetation about the edges of gorse brakes, etc.; pink, blue, and white varieties are not unfrequent.

CARYOPHYLLACEÆ.—*Dianthus armeria*; this is a common sea-side flower. Along the “flows” around the estuary of the Wampool there are literally acres of pinks, varying in shades of colouring from deep crimson to almost pure white. All through summer and autumn it continues to bloom. *Silene inflata*, an inland rather than a shore plant; a few plants noticed this season a little to the west of the old passenger station at Maryport; about Camerton Railway Station, abundant. *S. maritima*; this species, unlike the last, is everywhere present along the shore, of which it is one of the leading ornaments during summer. *Lychnis vespertina* is more plentiful towards the shore than I have elsewhere observed; towards evening, when the dew is falling, the flowers become odoriferous. *L. diurna*; many botanists are of opinion that this plant and the preceding one are but varieties of the same species: I hardly concur in this view, as I never could detect in the Red Campion any trace of the pleasant odour that distinguishes the other. *L. flos-cuculi*; this Campion, when in full blossom, is a characteristic feature of all the low-lying meadows towards the shore; I have seen some such fields beyond Allonby, so entirely covered with it, as to resemble nothing so much as a gigantic garden of Sweet Williams. Before quitting this section of the Pink family, I may notice that a single plant of *Saponaria vaccaria* was gathered this summer among the rubbish near Risehow. It was but a small specimen of the species. It appears in the list of excluded plants usually found in the Appendix of the London Catalogue as aliens, waifs of cultivation, etc.

Cerastium tetrandrum; this small plant is one that I had never observed before the spring of the present year, when I found it

growing about the base of the retaining wall of the railway, towards the beach, near Flimby station; the late Rev. R. Wood of Westward also discovered it some years ago at Allonby. *C. glomeratum* frequently occurs about places where water has stood during the winter months. The next species, however, *C. triviale*, is far the most abundant and widely-distributed member of this family; about the quarries to the north of Maryport it grows in great profusion. *C. semidecandrum* appears on the beach near Bank End. *Stellaria media* is too abundant everywhere to need description; the variety *b. borcaana* grows about some gardens near the Sun Inn, Flimby; the flowers are as a rule without petals. *S. holostea* is a common ornament of hedge-banks. *S. graminea* is equally common: a weak straggling plant, depending for support upon the shrubs—as gorse or brambles—among which it delights to grow. *S. uliginosa* is also common, but loves damp, and usually finds a place at the edge of ditches or slow-running brooks. *Arenaria serpyllifolia*; frequent among the ballast along the railway, or about the edges of dry embankments. *Honkeneya peploides*; no plant of the beach is more abundant than this; its thick glossy leaves are conspicuous everywhere; it is frequently mistaken for a *Sedum* or Stonecrop by persons imperfectly acquainted with botany. *Sagina apetala*; I cannot say positively that I have seen this species upon the beach; but it is a common garden weed of the outskirts of Whitehaven, as at Corkickle, etc. *S. procumbens*; greatly more abundant than the last mentioned, indeed almost ubiquitous; about the quarries referred to above hundreds of examples occur. *Spergularia arvensis*, too well and widely known as an agricultural pest; the “dodder” of the Abbey Holm farmers, and the “blore” of the inhabitants of Gosforth Bottoms, by whom it is held in equal detestation; on St. Helen’s farm it abounds, and large-flowering specimens in plenty grew about Siddick last season (1885). *Spergularia rubra*, with its pretty little pink flowers, occurs along the whole extent of coast up to the mouth of the Eden.

PORTULACACEÆ.—*Montia fontana*; this well known tenant of “well-eyes,” “totter-bogs,” and mountain rills, grows plentifully in

the Bank End stream already mentioned, down almost to high-water mark.

HYPERICACEÆ.—*Hypericum perforatum*, a common plant of dry ground, as *H. tetrapterum* is of ditch banks; the latter is much more frequently met with inland than near the coast line. *H. pulchrum*, occasionally seen on dry banks, as about the rocky bluffs of Harrington, Parton, etc.

MALVACEÆ.—*Malva sylvestris*, occasionally seen on rubbish heaps, as also about homesteads near the beach, as at Allonby, Mawbray, and other places.

LINACEÆ.—*Linum catharticum*; in some of the railway cuttings and embankments common enough; more frequent in poor than in moderately rich soil.

GERANIACEÆ.—*Geranium sanguineum*; a most brilliant and conspicuous flower of the coast, where alone it attains perfection; everywhere plentiful, especially so, perhaps, at Skinburness and Siddick; distinguished readily by its deep crimson corolla. *G. pratense*, the largest member of this handsome family, with deep blue corolla, the petals veined with white; stray examples have been found with light-coloured, almost crimson or lilac, petals; and once I recollect meeting with a plant bearing a corolla of creamy white, the veins of which stood out like threads of snow. *G. molle*, sometimes seen along the shore; in the fields adjoining the highway near Flimby, it grows very abundantly, though in a dwarfed state, owing to the poverty of the soil, which largely consists of dry gravel. *G. dissectum*; less common than the plant just treated of, yet is sometimes seen along the gravelly embankments of the railway. *G. robertianum*, on moist banks and hedgerows a common weed. *Erodium cicutarium*, on waste banks by the sea, frequent; it is sometimes found far inland; it grows upon the village green at Dalston, but its proper habitat is by the shore.

LEGUMINIFERÆ.—*Ulex europæus*, a common ornament of dry banks. *U. gallii*; this diminutive autumn-flowering species is

abundant in the district, though rather on open moors than close to the tideway. *Genista anglica* approaches the shore on the north side of the Wampool estuary, near Anthorn; a pretty little shrub; on Seaton Moor, etc., abundant. *G. tinctoria*, along with the last-mentioned. *Sarothamnus scoparius*; at many points along the coast may be seen blossoming in great profusion. *Ononis spinosa*, and *O. arvensis*, are by many authorities looked upon as varieties of the same species; the smooth-stalked type is much the more prevalent. It is Mr. Baker's opinion that the true *spinosa* is not found hereabouts. The finest specimens I know grow about Silloth, but the Restharrow flourishes along the entire coast. *Anthyllis vulneraria*; frequently found in situations where the surface has been disturbed; behind the iron furnaces here its sulphur-tinted flowers are more numerous and finer than I have elsewhere seen. *Medicago lupulina*, and *Melilotus officinalis*, are of casual occurrence along the shore, as at Workington north shore, Flimby, etc.* *Trifolium pratense*, and *T. medium*; the latter grows frequently in soils where the other species would certainly fail. A sea-side station seems somehow to intensify the colouring of flowers; there were some fine specimens of Cowgrass beyond Siddick this season, where the salt spray would doubtless reach them, and the colour was very brilliant. *T. arvense*; this curiously-tufted clover appears commonly on dry gravel banks all along the coast line; after the new passenger station was built at Maryport, it sprang up in abundance round the building, where patches of it yet remain; it is rarely found growing far inland, yet the the gravelly village green at Dalston is in places quite covered with these plants. *T. repens* is the well-known white, or, as it is sometimes styled, Dutch Clover. *T. procumbens*, so named from the resemblance of its heads of pale yellow flowers to those of the hop plant, is quite common, and so too is *T. minus*, the origin probably of the cultivated form, from which it differs but little in appearance. *T. filiforme*; in the beautiful manuscript botany of the late Mr.

The variety *M. parviflora* appears among other casuals on the heaps of rubbish behind the slag banks near Maryport, where also specimens of *Medicago denticulata*, var. *apiculata*, have been discovered since the paper was read.

Rooke of Whitehaven, is a drawing of this extremely rare plant, marked "St. Bees, 1845." *Lotus corniculatus* adorns almost every dry hillock of undisturbed ground, whether inland or on the beach. *L. major*, not so plentiful as the last, and preferring moist localities, as damp hedgerows and meadows. *Ornithopus perpusillus*; several patches occur close to the pathway that runs parallel to the railway behind the West Cumberland Iron Works at Workington; a few are observable on Flimby Green. *Vicia hirsuta*; a few straggling plants on the broken rocky ground about Parton, and towards Harrington. *V. cracca*, a very common species, distinguished by its drooping racemes of blue flowers; a climbing plant, seldom found self-supporting, but clinging to bushes by its tendrils. *V. sylvatica*; large patches of this beautiful species clothe the rocky bluffs that overlook the beach from Harrington westward; it is far from being a common plant; in the locality just mentioned, it is of a trailing habit of growth, the stems attaining a length of three or four feet, but in woodland situations it may be seen quite overtopping shrubs and coppice-wood at a height of eight or nine feet, by means of its powerful branching tendrils; its long lax drooping racemes of creamy white flowers delicately striped and tipped with violet, are extremely pretty, and I am tempted to think would be very ornamental objects in a shrubbery. *V. sepium* is a common hedgerow plant. *V. sativa* is cultivated by farmers for forage, and is seldom seen wild; several patches of it were, however, observable in July last (1885) growing on mossy ground at Dubmill, its habit was quite changed: having no support, the branches assumed a procumbent form, each plant covering a circular space of about two feet in diameter, studded all over with lovely crimson and purple flowers. *V. angustifolia*, though very rare in many parts, is abundant on the beach from Workington to Maryport; it flowers rather earlier than the preceding species. *Lathyrus pratensis*, in bushy places not unfrequent. *L. sylvestris*; this rare and remarkably handsome wild flower, which resembles the Everlasting Pea of gardens, was reported by the celebrated Mr. Ray as growing on the rocks at Redness Point, near Parton,

more than two hundred years ago, where it is still to be found ; and I was overjoyed not long ago to find it growing close to the line of rails a little to the east of Siddick Junction. *Orobus tuberosus* ; only sometimes found towards the shore line, but tolerably abundant in woodlands and heathy ground.

ROSACEÆ.—*Prunus spinosa*, a well-known and common shrub in hedgerows and brakes. *Spiræa ulmaria*, in ditches and moist meadows almost universally found. *Agrimonia eupatoria* ; this is a plant of some reputation among cottage “medicine-men,” and so eagerly sought after that it is becoming year by year of less frequent occurrence ; in some of its old stations already extinct, but still to be met with at no great distance from the shore. *Sanguisorba officinalis* ; this plant is supposed to possess valuable properties as a constituent of superior meadow hay. *Alchemilla vulgaris*, common in moist meadow and pasture lands. *Potentilla fragariastrum* ; on dry banks not rare, and flowers early. *P. tormentilla* ; on dry sandy or heathy ground. *P. reptans* ; less frequent than the preceding, very variable in character. *P. anserina* is well-known, and as a crop-weed very unfavourably regarded by agriculturists, yet not without use to the human species, since Dr. Hooker states that its root-stocks are eaten in seasons of scarcity by the natives of the Hebrides. *Comarum palustre*, found only in deep boggy ground ; plentiful in Salta Moss, by Dubmill. *Fragaria vesca* ; from early childhood most of us have known this wayside favourite, the common Wild Strawberry.

With a feeling of profound diffidence I come now to speak of the Brambles ; not that their spine-beset branches inspire me with dread, but because of their number and the extreme nicety of the distinctions which separate one species from another ; moreover it is not more than about two years since my first attempts were made in this direction. *Rubus idæus* is easily known ; not common on any part of the coast, it is yet specially plentiful in the interior of Lakeland, and children go raspberrying there as commonly as hereabouts you see them foraying for “black-kites.” Of the remaining species and intermediate varieties, the following occur

by the shore or places in close proximity—*R. lindleianus*, *R. rhamnifolius*, *R. discolor*, (a) *R. umbrosus*, (c) *R. pallidus*, *R. corylifolius*. *Rosa spinosissima* appears at intervals all along the coast, about Seascale, and again at Skinburness, appearing in pretty large patches. *R. mollissima*, not infrequent on dry hedge-banks; a remark applicable to the next species, *R. tomentosa*. The most common wild rose of the district is, however, *R. canina*, of which there are several varieties or sub-species; the whole family is but sparingly represented towards the coast, in comparison with the districts farther inland: this is markedly the case in the Whitehaven neighbourhood. *Cratægus oxyacantha* needs no comment here. *Pyrus aucuparia*, occasionally found not far from the shore; in autumn its brightly tinted berries make a fine show; though not regarded as poisonous, I have known children become seriously unwell after eating them. *P. malus*, familiar among us as the Common Crab-tree.

ONAGRACEÆ.—*Epilobium hirsutum*; this large and handsome flowering plant is specially abundant on the banks of the different streams that discharge their waters into the Solway, from the Ehen to the Eden; here at Maryport you may notice it in perfection about the Old Reservoir, across the river and railway from Netherhall. Here also may be found three others of the family, *E. parviflorum*, *E. montanum*, and *E. palustre*, characteristic examples of which grow on the abandoned garden patches behind Mrs. Senhouse's park wall; it grows more abundantly, however, about Salta Moss, where the surroundings are more to its liking.

HALORAGIACEÆ.—*Myriophyllum alterniflorum*; in the Old Reservoir at Maryport, in those connected with the West Cumberland Iron-works at Workington, in a long narrow pool beyond Bank End, in the Dubmill Pond, etc. *Hippuris vulgaris*; this curious and rare plant is found in a sluggish and boggy open ditch on the Oldkilm farm, forming the boundary which separates the farm from the adjoining peat-moss; it is the only station for the plant with which I am acquainted. *Callitriche verna*; in the Old Reservoir here, and generally in pools and by the edges of slow-

running water, quite common; so too is another species, *C. stagnalis*, var. *platycarpa*; this latter in a well-developed form, appears in the brook by the roadside at Bank End.

CRASSULACEÆ.—The Stonecrops are but meagrely represented along shore. *Sedum telephium*, on the rocks at St. Bees and at Parton; just a little way inland, as about Edderside, New Cooper, Aikshaw, etc.; it is a common plant of dry old-fashioned hedgerows. *S. anglicum*; a former well-known station of this pretty little *Sedum* has lately disappeared, where a new wall has supplanted an ancient wayside hedgerow between Allonby and Dubmill; it is yet abundant about Cardrunk Point, and may also be seen on dry banks at Couderton. *S. acre* grows freely on the shore on both sides of the Derwent at Workington, on the beach about Saltpan, and elsewhere. *S. sexangulare*; while residing at Watermillock, some six years ago, I received plants of this species from the late Mr. W. Dickinson, F.L.S., of Thorncroft, which had been gathered by him on wall tops at Workington and about Hunday.

SAXIFRAGACEÆ.—Like the last order, represented on the coast by very few species. *Saxifraga tridactylites*; on wall tops and old cottage roofs; nowhere abundant here, though familiarly met with in many parts of the county, especially in limestone districts. *S. granulata*; in dry gravelly places along the beach; quite large patches of this very interesting flower are to be seen on the railway embankment between Flimby and St. Helen's, also between Bank End and Allonby. *Chrysoplenium oppositifolium*, and *C. alternifolium*; these slender, succulent plants, are to be sought for in moist shaded situations: the former greatly outnumbers the latter, indeed, I am not altogether certain whether I have ever seen the alternate-leaved type quite near to the shore; it is decidedly scarce anywhere.

LONDON PAST AND PRESENT:
THE PRESIDENTIAL ADDRESS AT KESWICK.

By DAVID AINSWORTH, Esq.

AFTER the fullest enquiry, several antiquaries and historians hold the opinion that London is of Roman formation, and no older than the time of Claudius: but we need not necessarily dispute the existence of a British London. There can be but little doubt that the name of London had a Celtic origin. The place was probably very small; but it must have been chosen for its commanding position on the banks of a fine river; and there may be some truth in the assertion that one Belinus formed a port or haven on the site of the present Billingsgate. What a British town was like we learn from Julius Cæsar: "It was nothing more than a thick wood fortified with a ditch and rampart, to serve as a place of retreat against the incursions of their enemies."

We may therefore imagine a clearing out of the great forest of Middlesex, extending from St. Paul's Cathedral to the Bank of England, with the dwellings of the Britons on the higher ground overlooking the Thames. The late Mr. Thomas Lewin indicated even the extent of a British London as situated on the hill between the river *Flete* in the west, and *Wallbrook* on the east. The western gate was *Ludgate*, and the eastern *Dowgate*—and these two names are doubtless of British origin: but the origin of London will probably always remain a subject of dispute, for want of decisive facts. A negative fact is, that very few remains earlier than the Roman occupation have been discovered. In 1867,

certain piles in excavations near London Wall and Southwark Street—possibly the remains of pile buildings—were discovered. They were found in the peat above the virgin gravel, and were most probably sunk by the Britons rather than the Romans, as the capital of the former would be situated in the marshes, and of necessity built on piles.

There is some reason to believe that there were two settlements, one on the north and the other on the south bank of the Thames. If so, they would be in the territories of distinct, if not hostile, tribes. There was probably a ferry, if not a bridge, of some description between the two shores.

The original surface of the soil of London has been much altered in the course of generations, the depth of made earth being often very great. At one period the Thames flowed straight from Lambeth to Limehouse, instead of describing the large figure S, as at present; and the greater part of the district now stretching south and east of the river to the range of heights in the neighbourhood of Sydenham and Greenwich, was occupied by marshes and shallow lagoons. The original city, clustered round the eminence now crowned by St. Paul's, was bounded on the north and east by an extensive *fen*, from which *Finsbury* takes its name. On the west the Fleet river, already mentioned, was navigable to King's Cross, and for a long period formed a convenient and well-protected harbour for the city. On account of the steepness of its banks it received the name *Holeburn* or *Hollowburn*, now left in the name *Holborn*, although the river is now covered over, and has disappeared to the sight.

Two of the most important points connected with Roman London are the existence of a bridge, and the purpose of the "London stone."

Dion Cassius, in the 3rd century, states there was a bridge over the Thames at the invasion of Claudius A.D. 43, a little above the mouth of the river; but as the mouth of the Thames was then nearly where London Bridge now stands, this bridge was probably almost in the same place. Throughout the entire line of the old bridge the bed of the river was found to contain ancient wooden

piles : and when these piles were pulled up to deepen the channel of the river, many thousands of Roman coins, with abundance of broken Roman tiles and pottery, were discovered. The enormous quantities of Roman coins may be accounted for by the well-known practice of the Romans to make these imperishable monuments subservient to perpetuating the memory of both their conquests and their public works.

The "London Stone" has very generally been supposed to be a *milliarium* of central point for measuring distances ; but Sir Christopher Wren believed it was part of some more considerable monument in the Forum, his reason being that "in the adjoining ground on the south side, after the great fire, were discovered tessellated pavements, and other extensive remains of Roman workmanship and buildings." It is fixed at present close under the south wall of St. Swithin's church. It was fixed deep in the ground, and is mentioned in the time of Athelstan, King of the West Saxons, without any reference to its being a Roman military stone, so that there is some probability the "London Stone" is a prehistoric monument.

At the beginning of the 5th century the Romans left Britain, and probably till the arrival of the Saxons, London continued an important commercial town. The Saxons disliked walled towns, and in many instances destroyed those they conquered. This was not done in London, and it is just possible the Britons may have been able to purchase freedom from destruction. Mr. Freeman does justice to the stout heart of the Londoners, and calls London during this period "the stronghold of English Freedom." The Saxon Chronicle has little to tell of London between the 5th and 9th centuries ; but the city is described by Bede as being in 604 the metropolis of the East Saxons, and an emporium of many peoples, who came to it by sea and land. And about the year 1000, when Canute became master of England, the tribute which the townsmen of London had to pay was £10,500, or about a seventh of the amount which was paid by all the rest of the English nation. This shows the growing importance of the town.

There is little more to be said of the history of Saxon London

than that Edward the Confessor held his Witanagemot at London, and built and consecrated Westminster Abbey. As the coronation church of the sovereigns of England from the time of Harold, and on account of its proximity to the seat of English government, Westminster Abbey has acquired a fame and importance in a certain sense outvying St. Paul's. There was a chapel here previously built by Siebert in honour of St. Peter, and succeeded by a church in 980; but this being demolished by the Danes, Edward the Confessor built an abbey and church in 1065, of which there is now little left, and Henry III. commenced to rebuild it in 1220, but the building was practically completed by Edward I., though additions and improvements were made by Henry VII.

A wonderful improvement in the appearance of the cities of the country marked the advent of the civilizing Norman. In the second year of his reign, William the Conqueror granted the remarkable charter written in Anglo-Saxon, which still exists among the archives of the City of London. There are but four lines and a quarter, and the size of the slip of parchment is only six inches by one inch. It runs thus: "William the King greets William the Bishop, Godfrey the Portreeve, and all the Burgesses within London, both French and English. And I grant that they be all law-worth, as they were in Edward the King's days. And I will that each child be his father's heir after his father's days. And I will not suffer that any man do you wrong. God keep you."

Within a few years handsome buildings arose in all parts of the city; and in August 1077 occurred a great fire, "such a one, as never was before, since London was founded." This constant burning of large portions of the city is a marked feature of its early history; and we must remember that, though churches, monasteries, and public buildings were rising on all sides, and built of stone, the ordinary houses were small wooden structures. There was also in 1090 a tremendous hurricane, which blew down six hundred houses and many churches. A portion of the roof of St. Mary's-le-Bow, in Cheapside, was carried off, and was forced

into the ground as much as twenty feet—which does not say much for the condition of the thoroughfare !

The great change in the aspect of London by the establishment of large numbers of monasteries, was continued and increased in the 13th century under the Plantagenets, the various orders of the Friars establishing themselves there. The Benedictine monks preferred secluded sites, the Augustinians did not cultivate seclusion so strictly : but the Friars chose the interior of towns from preference. The Black, Preaching, or Dominican Friars settled near Holborn, in what was afterwards Lincoln's Inn. The Grey Friars, or Franciscans, got an estate, and erected their convent on the site now occupied by the Blue-Coat School. The White Friars, or Carmellites, settled between Fleet Street and the Strand, which liberty still retains their name. The Austin Friars, or Friars Eremites, were founded in Broad Street Ward ; and the last of the Friaries to be established was that of the Crutched or Crossed Friars, in 1298. These localities are now known by these names. By the establishment of these religious houses, two-thirds of the entire area of London was occupied by convents and hospitals. This is the most marked characteristic of Plantagenet London.

The rebuilding of London Bridge in stone was commenced in 1176. It consisted of twenty stone arches, a draw-bridge with a gate-house at each end, and a chapel or crypt in the centre. Fitzstephen, the monk of Canterbury, who lived at this time, has left us a vivid description of London. He speaks of its wealth, commerce, grandeur, and magnificence, of the mildness of the climate, the beauty of the gardens, the sweet, clear, and salubrious springs, the flowing streams, and pleasant clack of the water-mills. Even the vast forest of Middlesex, with its densely wooded thickets, its coverts of game, stags, fallow deer, boars, and wild bulls, is pressed into the description, to give a contrast which shall enhance the prosperous beauty of the city itself. He tells how, when the great marsh on the north of the city was frozen over, the young men went out to slide, skate, and sport on the ice. Skates made of bones have been dug up of late years in this district. This

sport fell into disuse, and was not again prevalent till after the Restoration, when it was re-introduced from Holland.

In the first year of Richard I., the Court of Aldermen ordained that houses should not be built of wood, but should have a stone wall sixteen feet from the ground, and be roofed with slate or tile : but the houses, in spite of this, were largely built of wood. Most of them were plastered and whitewashed, and one of the earliest objections made by Londoners to the use of sea coal was, that "the smoke blackened the white walls of their buildings."

As the chief feature of Norman London was the foundation of monasteries, and the chief feature of Plantagenet London was the establishment of friaries, so Tudor London was specially characterized by the suppression of the whole of these religious houses, and also of the numberless religious guilds and brotherhoods. When we remember that about two-thirds of the area of London was occupied by these establishments, and that about one-third of the inhabitants were monks, nuns, and friars, it is easy to conceive the disorganization which would arise by this root and branch reform. All the religious houses, and those of the friars lately referred to, were all condemned in November, 1538. Their buildings were in some cases used as hospitals, e.g., the monastery of St. Thomas in Southwark, was purchased by the citizens, with the manor of Southwark, which was enlarged and prepared for the reception of "poor, sick, and helpless objects," and thus was founded St. Thomas's Hospital, which is now situated in Lambeth. The old Palace of Bridewell, in the city, was given "for the lodging of poor wayfaring people, the correction of vagabonds and disorderly persons, and for finding them work." That much of London was in the time of Henry VIII. in a wild and uncultivated condition, is proved by a proclamation of his, the object of which was "to preserve the partridges, pheasants, and herons from his palace at Westminster to St. Giles in the Fields, from thence to Islington, Hampstead, and Hornsey Park." A proclamation was issued in 1580, prohibiting the erection within three miles of the city gates of any new houses or tenements "where no former house hath been known to have been." Only one family should live in

one house; empty houses built within seven years were not to be let; and unfinished buildings on new foundations were to be pulled down. (A good way to prevent overcrowding and speculative building!!) In spite of these restrictions, London continued to grow. St. Giles was literally a village in the fields; Piccadilly was the "way to Reading;" Oxford Street the way to Uxbridge; Covent Garden an open field or garden. Citizens went to Holborn or Bloomsbury for change of air. The Strand was filled with noble mansions washed by the waters of the Thames, but the street was little used by pedestrians. Londoners frequented the river, which was the great highway. The banks were crowded with stairs for boats, and the watermen of that day answered to the chairmen of a later date, and to the cabmen of to-day.

In the Stuart period, from the accession of James to the death of Queen Anne, greater changes occurred than at any other period. In the early years, much of the life of the time was in the city; but in the later years, at the beginning of the 18th century, social life had permanently shifted to the West-end. The civil wars and the fire changed the whole aspect of London. For years past the sanitary condition of the houses must have been most deplorable, and the plague and other diseases were constantly appearing, until the great fire cleared away all the abominable buildings, which were the centre of infection.

Before leaving the reign of James I., it is interesting to note one or two social matters. The Moorfields had been drained and laid out, but beggars frequented the place, and travellers to London passed over it as rapidly as possible. Fleet Street was the show place of London puppets, wild men, and wild beasts. The great meeting place for Londoners was the nave of old St. Paul's. Crowds of merchants with their hats on transacted business in its aisles, and used the font as a counter on which to make payments; lawyers received clients at their several pillars; and masterless serving men waited to be engaged on their own particular bench. Besides those who came on business, there were gallants in fashionable finery, so that it was worth a tailor's while to stand behind a pillar and take notes. When the cathedral was being re-built, Sir

Christopher Wren made a strict order against any profanation of the sacred building. Another favourite haunt was the garden of Gray's Inn, where the choicest society was to be met; and we are told that Mrs. Pepys went on one occasion specially to observe the fashions of the ladies, because she was then "making some clothes."

London had been ravaged by plague on many former occasions, but the pestilence which began in December, 1664, will ever live in history as the Plague of London. On the 7th of June, 1665, Pepys for the first time saw two or three houses marked with the red cross, and the words "Lord have mercy upon us" on the door. The deaths daily increased, and business was stopped. Grass grew in the area of the Royal Exchange at Whitehall, and in the principal streets of the city. On the 4th September he writes from Woolwich: "I have stayed in the city till above 7400 died in one week, and of them about 6000 of the plague, and little noise heard day or night but tolling of bells."

The plague was scarce stayed before the city was in flames—a calamity of the first magnitude, but one which in the end caused much good, as the seeds of disease were destroyed. The fire broke out at one a.m., on 2nd September, 1666, at a house in Pudding Lane, and ended at Pie Corner. A strong east wind helped the flames, which raged all Monday and great part of Tuesday. The wind fell on Tuesday night, and the flames slackened on Wednesday. On Thursday it was extinguished, but broke out again that night at the Temple. Houses were blown up with gunpowder, and the fire finally mastered. Interesting details are given by Pepys in his Diary, which time will not allow of my quoting here; but the river swarmed with vessels with persons carrying away their goods, and many fled to Hampstead and Highgate, though Moorfields was the chief resort of the houseless Londoner. Within a few days of the fire, three several plans were presented to the King for the rebuilding of the city. Wren proposed to build thoroughfares north, south, east and west; to insulate all churches in conspicuous positions, to form the most public places into large piazzas, to unite the halls of the twelve chief

companies into one large square annexed to the Guildhall, and to make a fine quay on the bank of the river from Blackfriars to the Tower. His streets were to be of three magnitudes—ninety feet, sixty feet, and thirty feet. In spite of the best advice, the jealousies of the citizens prevented any systematic design being followed, and the old lines were in almost every case retained. Wren built St. Paul's and the many churches round it; but it is much to be regretted that his scheme for laying out the city was not adopted. A great impetus of change was given by this fire, as the wooden houses now gave place to brick, and an Act of Parliament for rebuilding the city of London gave the *coup de grace* to the carpenters as house builders.

With this rebuilding and great extension of the city, we may consider *modern* London, as contrasted with *old* London, commences.

Public buildings, of a most tasteless character, were erected; and these are only now being replaced, and the ugly appearance of many of the streets amended. Coaches and chairs began to take the place of the old conveyance by water, and the banks of the river became naturally neglected, the town spreading in all directions. In 1750, Westminster Bridge was opened, and London Bridge ceased to be the only one connecting the two banks. Dr. Johnson said to Boswell in 1775, "Why sir, Fleet Street has a very animated appearance, but I think the tide of existence is at Charing Cross."

To come to the present 19th century. Since 1800 the City itself has been almost entirely rebuilt, and many of the squares, such as Russell and Bloomsbury, were laid out soon after 1800. The growth in those parts has been rapid, and to show how late it has been,—at that time grapes were ripened by the sun in the open air in gardens in Gower Street, and twenty-five dozen nectarines were gathered in 1800 from three completely-exposed trees in a garden there; and the richest flavoured celery was gathered there in abundance. I believe in the time of George III., if not later, snipe were shot just behind Buckingham Palace, in a place now three or four miles from anything approaching country.

Within the last twenty years the rate of increase of population in the outer ring of London has been 126·8 per cent., while that of London proper has been only 36 per cent.; and in the city there has actually been a decrease of 56 per cent., which has been occasioned chiefly by improvements, but in the central business districts it is almost entirely the result of the substitution of business premises for dwelling houses. The Day Census of the City in 1866 shows the number of persons employed was 170,000, and in 1881 there was a day population of 261,000. While the night population in 1871 was 74,897, and in 1881 only 50,526! This is owing to the facilities afforded by the underground and suburban railways and workmen's trains, by which artisans and clerks can live in fresher air and cheaper lodgings, and get to their work in good time in spite of the distance they have to travel.

It is interesting to note, though figures are dry subjects, that the population in 1801 was 958,000, thirteen persons to an acre; in 1881 the population was 3,818,000, or fifty-one persons to an acre; and the rateable value of the City and liberties has since 1801 increased sevenfold, having risen from £507,000 to over £3,000,000.

The number of passengers and vehicles over London Bridge was taken in 1823, and again in 1881, and in the former year they numbered 89,000 and 6,182 respectively, and in the latter year nearly 158,000 and 21,466.

Hackney coaches are first mentioned in 1625, when they were kept at inns, and only numbered twenty; and they were limited afterwards in number, increasing to 1200 in 1800; and in 1832 the restriction in the number was abolished. In 1871 the number of cabs was 8,000, and in 1881, 9,500, of which more than half were hansoms, and there were nearly 1,000 less four-wheelers than before; so that what Lord Beaconsfield calls the "gondola of London," or the hansom cab, largely increased, and has now made still further progress both in numbers and comfort.

The lighting, too, of the metropolis, is an interesting history of progression. In 1416, the citizens of London were under an obligation to hang out candles between certain hours on dark

nights, for the illumination of the streets; and in 1661 a special Act of Parliament was passed to enforce the custom. The custom was, for the watchmen to cry at dusk "Hang out your lantern and whole candle light!" And the origin of this somewhat peculiar phrase is said to have arisen from a witty citizen, who hung out a lantern and no candle. When remonstrated with for having no light, he hung out the lantern and a small bit of candle attached, but not lighted; and finally the order was made as above, to oblige him to put in a whole candle, and lighted; and this, or oil lamps, was in use till 1807, when Pall Mall was lit on one side only with gas, oil being still used on the other side. And lately, if not still, some of the streets of Paris were *lighted*, if the term is admissible, by one or two miserable oil-lamps.

The extinguishing of fires has only within recent years been thoroughly organized. Till 1866 the duty of extinguishing fires was in the hands of Fire Insurance Companies, which in 1852 united in support of one brigade for the whole of London, but only kept a small establishment in the centre of the metropolis. Now the whole is under the charge of the Metropolitan Board, and is most efficiently worked.

Since 1866, the per centage of serious fires has diminished in a remarkable degree—getting less each year. In 1866, there were 25 per cent. serious, and 75 per cent. slight; in 1885, there were 7 per cent. serious, and 93 per cent. slight. The total number of fires in 1885 was much larger than in 1866, being 2,270 as against 1,338; but although the fires were about 1000 more in number, or one-third more than in 1866, there were only half the number of serious fires, the numbers being: in 1866, 326 serious, total 1338; in 1885, 160 serious, total 2270.

The climate of London is remarkably healthy, the yearly rainfall in inches is only 24·8 on an average for thirty-two years. And we well know what it is at Keswick. I remember one winter at Wray Castle we might measure rather by feet than inches, for in December we had eleven inches, and in January thirteen inches, or an average of a foot a month; and as much in two months as in London in twelve.

The smoke and consequent fogs are drawbacks; and in 1306, when the population did not exceed 50,000, the citizens petitioned Edward I. to prohibit the use of sea coal, and he passed a law making the burning of it a capital offence. In 1661, John Evelyn complains in his book that on account of the increase of coal smoke, the gardens no longer bear fruit; and instances various cases in which the smoke had been prejudicial to health. The smoke-producing area has since then increased from three square miles to ever one hundred square miles; and the average daily consumption of coals in domestic fire-places has increased to about 27,000 tons, and in winter 40,000; producing a cloud of smoke which frequently hangs over the town, even when it does not descend in fog. During the bad fogs in 1879-80, chest affections increased over 200 or even 300 per cent.; and the death rate rose from 27 per cent., the rate per week, to over 35 per cent., owing to dense fogs in February, 1882. We can all remember when some fat animals died at an Islington Show, some few years ago, from the effects of bad foggy weather. The weather and temperature has great effect on invalids; and during a late severe winter, a large pile of snow was cleared from the streets, and heaped in one of the west-end squares, and a medical man informed me that it had a marked effect on the air in the neighbouring houses, and tended much to prevent the recovery of his patient in one of them. I remember some time ago seeing a paper in the *Lancet* stating that the peculiar yellow fogs were a characteristic of this part of the Thames valley, and had been known a thousand years: but no doubt they have been much intensified of late years.

We have already referred to the population of London. Its composition is interesting; and probably in no city in the world are the rich and poor so closely situated in respect to their dwellings—or at least *were*, till the recent improvements—and yet know little or nothing of each other; and it may well be said that “one half of the world does not know how the other half lives.” In Westminster are some of the lowest haunts of the criminal classes, and close at hand are some of the finest mansions. In the district of Belgravia, new streets with the best class of houses have

been cut through and out of a district of the poorest. The different races and trades to a great extent occupy different districts.

In 1650 Cromwell allowed the Jews to return to England, after a banishment of centuries, and those settling in London chose the district of Aldgate for their residences. There are now over 40,000 of them. The special foreign district of London is that of Soho. The main street is still called Greek Street; and this has now been opened up and more light and air admitted to the crowded population by the new street called after the philanthropic Lord Shaftesbury—Shaftesbury Avenue.

Another foreign district lies in the neighbourhood of Ratcliffe Highway. The Italians number some 8000, and are principally street musicians and vendors of ices, and form a small colony in Hatton Garden. The Germans number 60,000, and are largely employed in the sugar factories, where they stand the great heat much better than other nations, and can imbibe enormous quantities of beer without detriment.

The French—a less colonizing people than the German—numbers only half the German population; and the revocation of Edict of Nantes in October, 1685, causing a migration of a large number of French Protestants, occasioned a considerable growth in the East-end of London, where the silk manufactories of Spitalfields were then established. It was a flourishing business for many years, but owing to large mills started in Lancashire and Staffordshire, and improved machinery, for the last fifty years it has been in a very depressed condition.

The majority of other manufactures is carried on near the Thames. Ship-building in 1881 consisted of yachts principally. The total number of ships built was only sixty-four, averaging forty to fifty tons each. Lucifer-match making gives employment to a large number of families in the East-end, and engineering, pottery, glass works, tanneries, chemical works, paper works, and sugar bakeries are all carried on in different particular localities near the river.

A large trade in second-hand clothing is done by the Jews in Houndsditch, especially on Sunday mornings; and on the same

day in the week there are bird- and fancy-animal fairs in several places in the East-end and in St. Giles.

The condition of the poor has attracted much attention lately, and the Commission recently appointed, and in which the Prince of Wales took a prominent part, has after much investigation, published a long and interesting report, giving much valuable information respecting the housing of the poor, and their social condition.

I some years ago visited the East-end of London late in the evening, and saw the kitchens, lodging-houses, and shops of the poorest and lowest classes in the great city. The chief comfort was always a large fire burning in a "thieves' kitchen," where the poor creatures can dry themselves if wet, and get hot water for making their tea or cooking their supper, before going upstairs to bed. Sometimes a song is sung, or a story told, for the amusement of each other or strange visitors. There are small shops open nearly, if not quite, all night, where penny-worths, or even farthing-worths, of tea, sugar, bacon, etc., can be bought. These small quantities are neatly put up in small paper "screws," ready to be sold, and form just enough for a somewhat meagre meal. Besides, this must really be an expensive way of buying. Had the purchaser the means, a larger quantity would be a much cheaper and better investment : but their whole life is from hand to mouth. This population has no settled home. If they gain a few pence a day they go to a lodging-house ; if not, they resort to the casual ward of a workhouse, or sleep on the benches in the parks in the summer nights.

Many of these people are dock labourers. The docks open very early in the morning, and if extra hands are wanted, there is a rush among the unemployed to get first to the barriers when the gates are opened. The Irish are always helpful to their friends ; and in a great crowd, when one wants to get to the front, they hoist him on their shoulders, and shove him sometimes over the heads of those in front, so as to reach the first row. This was an old practice in the gallery of a theatre, and was called "swimming the gallery." They work very late unloading cargoes, and then

retire to the lodging-houses I have named, calling at the small shops, and probably a public-house, on the way. Much of this poverty arises from unthrift.

For much information about the London poor I am indebted to Mr. Cockran, who has for years been intimately connected with the East-end, and "The Charity Organization Society." It is to be regretted that that admirable society does not receive more help, and that the whole system of relief is not better organized, and administered through one channel, and through one channel only. Indiscriminate charity is a most fatal mistake. It pauperises the recipient: and full enquiry is absolutely necessary in every case. As a rule, the *deserving* cases never come before the ordinary donor. The really deserving poor would rather starve than beg; and it is only to those who go daily among them and know them intimately that the real can be separated from the fictitious—the deserving from the undeserving.

I have perhaps devoted too much time to the life of the people in the East-end of London; but the condition of one's fellow-creatures is interesting to us all, and the more perhaps when it is different from our own. Of those in the West-end, and the upper classes, there is less to be told. They are well fed, well housed, and have everything that art and science can produce for the delight of the senses. And it is a healthy movement to see the undoubted desire to throw more and more open to other classes the institutions which are public, and therefore for their use and benefit as much as ours. The vast stores that London possesses in the collections of art, natural history, and science, should surely be utilized for the benefit of the whole population of the great city, and at all possible times be open to them for recreation and improvement. To most of us the welfare of our fellow creatures is interesting, and I have always taken a special interest in the social questions connected with it. This must be my excuse for making it largely the subject of my address to you to-day, and for taking up so much of your time and kind attention. But though not a literary or scientific subject, I may perhaps be allowed to excuse myself with the words of Pope, with which I will conclude, that—

"The noblest study of mankind is man,"

THE MINERAL SPRINGS NEAR KESWICK.

By J. POSTLETHWAITE, F.G.S.

At Brandley Mine, and at Saltwell Park, there are saline springs ; and at Woodend Mine, near Threlkeld, a chalybeate spring. Of the former, the one at Brandley Mine is the more copious, and the water it discharges has been analysed by Mr. Thomas Ransome, with the following result :—

Chloride of Calcium	...	87·67	grains per pint.
Do. Magnesium	...	1·53	” ”
Do. Sodium	...	110·23	” ”
Sulphate of Magnesia	...	4·35	” ”
		<hr/>	
Total		203·78	
		<hr/>	

or about $203\frac{3}{4}$ grains of solid matter in the imperial pint. The quantity of water discharged from the mine, when it was worked, was about 180 gallons per minute ; but as I believe the outflow is somewhat less when the mine is full of water, it will be safer to estimate at 150 gallons, or 1200 pints per minute. Therefore, the solid matter conveyed away by the water which flows from Brandley Mine is about 35 lbs. per minute ; amounting to $22\frac{1}{2}$ tons every twenty-four hours, 8,197 tons every year, or 819,700 tons in one hundred years : and this has been going on for ages. We must not suppose, however, that the space from which this immense quantity of matter has been removed, is left entirely empty ; in all

probability the water which conveyed it away would deposit another substance in its place.

This water contains a very large amount of Chloride of Calcium, but the deficiency of the Sulphate of Soda and of Magnesia will prevent its being used successfully as medicinal water. Chloride of Sodium, or common Salt, is the most prominent of the substances which it holds in solution, amounting to more than one half of the solid contents. The Skiddaw Slate, through which the water percolates, contains a small quantity each—of Lime, Magnesia, and Soda, but it is scarcely possible that the whole of these substances contained in the water can be derived from that source; therefore, it is natural to suppose that a large bed of Rock Salt must exist in the heart of the mountain, or beneath its base. I say large, because the water has been bearing it away for ages, and it is still unexhausted. The quantity of salt contained in the water is 110·23 grains in the imperial pint; and calculating the flow of water at 1,200 pints per minute, it will give a total of 18 $\frac{3}{4}$ lbs. per minute, 12 tons 3 cwt. every twenty-four hours, 4,434 tons every year, or 443,400 tons in one hundred years. We may suppose that the position of this bed of rock salt is at the base of the mountain, and it may probably extend from Manisty to the northern side of the highest peak of Catbells; or, there may be two beds, one beneath Maiden Moor, and the other beneath the peak of Catbells: but the exact position of the bed, or beds, and their extent, are questions that will in all probability remain forever unsolved. Their origin is also equally obscure.

Rock salt is rarely met with in primary rocks, being chiefly found in formations of a much more recent date. In the valley of the Weaver, near Northwich, an immense bed of this mineral occurs in the Trias formation, which in some parts attains a thickness of one hundred and seventy feet. It is generally supposed that this and similar deposits have been formed by the evaporation of sea water. If we suppose that a lagoon existed on the sea shore, separated from the ocean by a sand bar, so high that only high tides could overflow it, and thus replace the water that was constantly being carried off by evaporation, we can readily under-

stand that in the course of time an immense quantity of saline matter would accumulate at the bottom of the lagoon. Then a depression of the coast would cause a layer of sand or of sedimentary matter to cover it, and produce all the conditions of a bed of rock salt, such as occurs in Cheshire and elsewhere. But the deposits of saline matter from which the Brandley and Saltwell springs are supplied could hardly have been formed in that way, because the sedimentary rocks where they occur are such as would be deposited in a moderately-deep and tranquil sea, rather than on a storm-beaten coast. And if we suppose that they were formed at the head of a narrow estuary, along which the tides flowed, the evidences of tidal action could not have been entirely obliterated. Then, if their surroundings do not warrant the assumption that they were formed near a sandy beach, could they have been deposited at the bottom of a deep sea? Sir Charles Lyell states that Dr. Wollaston ascertained by analysis, that water taken from the Mediterranean at a depth of six hundred and seventy fathoms, contained four times the amount of salt that was found in water near the surface; and he endeavours to account for the fact that the amount of salt in the water of the ocean does not increase, notwithstanding the immense quantities that are constantly poured into it from rivers, by supposing that the saline matter gravitates towards the deepest parts of the ocean, until it becomes so dense that it crystallizes, and is precipitated on the bottom. This theory would just suit the case of our Brandley and Saltwell Park deposits, but unfortunately, I believe that more recent investigation has tended to prove that water taken from great depths in the sea, contains very little more salt than it does near the surface.

Chloride of Sodium is one of the products of volcanic emanations, of hot springs, and most of the mineral water in volcanic districts; and some scientific gentlemen have been led to suppose that salt springs, although at a great distance from any active volcano, may have their origin in deep-seated volcanic sources. We might have found in this theory a solution of the difficulty, by assuming that the sources of the springs at Brandley Mine and Saltwell Park are as deep seated as that whence the materials which form the

beds of ash and lava on the opposite shore of the lake were derived ; but if so, the water would have been at a high temperature, whereas, it is very little if any higher than that of other springs in the neighbourhood. But the large quantity of Chloride of Sodium contained in the water, namely, 87·67 grains in the pint, renders it more probable that it proceeds from marine deposits than from a volcanic source.

With reference to the chalybeate spring, which finds an outlet at Woodend Mine, near Threlkeld, I am not aware that the water has ever been analysed, and therefore cannot enumerate the minerals it contains, nor give their relative proportions ; but there is sufficient evidence to prove that it contains a large amount of iron. The stones in the brook into which it flows are coated with the mineral, and when the mine was re-opened about ten years ago, after having been closed thirteen years, it was found that at the point where the mineralized water enters the level, large masses of iron [limonite] had been deposited on the sides, and were hanging from the roof in the form of stalactites, filling up more than half of the width of the level. The large quantity of iron contained in the water is in all probability due to the decomposition of iron pyrites, which occurs in great abundance in the Woodend veins, whence it is constantly being conveyed away to assume new forms and to enter into fresh combinations elsewhere.

LOCAL SCIENTIFIC NOTES AND MEMORANDA.

PURPLE-GREY CARBONIFEROUS ROCKS AND THE WHITEHAVEN SANDSTONE.

IN Part IX. of our *Transactions* I made some remarks on the Whitehaven Sandstone,* and incidentally criticised a paper of Mr. J. D. Kendall's, in which he appeared to me to assume that †Purple-Grey Carboniferous rocks were necessarily of Whitehaven Sandstone age, though, as I pointed out, they occur on almost every horizon throughout the Carboniferous series in Cumberland. My contention was, consequently, that purple-grey rocks should not be assumed, on the mere ground of colour, to belong to the Whitehaven Sandstone group, and, like it, to lie unconformably on the Carboniferous beds beneath. That geologists had for many years recognised the unconformity of the Whitehaven Sandstone, but that actual evidence of unconformity was necessary before it became safe to infer that the purple-grey rocks of any given locality were of that age. In illustration, I referred to Mr. Kendall's sheet of vertical sections, pointing out, with regard to those of Bullgill and Aspatria, that, looked at without theoretical preconceptions, their general correspondence seemed to make the relegation of the greater part of the latter to the Whitehaven Sandstone series an unsound determination.

Mr. Kendall, in his reply (Part X.) agrees with me that "mere

* pp. 113—117.

† Proc. N. Eng. Inst. Min. Eng. Vol. xxxii. p. 319 (1883).

tint itself, without specific evidence of unconformity in each case, can give no presumption of any weight as regards affinity or age." Yet he states in the very next sentence, that he holds "that the purple-grey colour accompanies *an unconformity* (in the district under consideration)," and that he does not assume "that there is an unconformity because some of the uppermost rocks of the Coal Measures differ in colour from the main mass below." I cannot see any real distinction between assuming that the "purple-grey colour accompanies *an unconformity*," and assuming the existence of a nonconformity on the mere evidence of the colour. Mr. Kendall admits that some purple-grey sandstone at Blencow is of Yoredale, not Whitehaven Sandstone, age, but thinks that this and other examples of purple-grey Carboniferous sandstone, being outside the area embraced in his paper, have no bearing on the question. But surely, as the Carboniferous Rocks of Cumberland form one series, and show purple-grey beds on almost every geological horizon, any theory not fully recognising the wide distribution of these beds is extremely likely to be wrong.

Mr. Kendall notices certain differences in detail between the Bullgill and Aspatria sections, differences such as commonly occur in sections of the same beds at collieries similar distances apart; but omits to see that the colliery workings in this case would allow the existence of an unconformity to be *proved*—did one exist. Could Mr. Kendall have demonstrated the existence of this supposed unconformity from the evidence of these workings, he would have shown the accuracy of his determination in this instance, in spite of the remarkable coincidence between the distances of the coals, etc., at the two places, tending to an opposite conclusion. But, failing this, he has done nothing whatever to strengthen his case or to weaken my illustration. And as no one of those best practically acquainted with the Aspatria collieries seems ever to have suspected the existence of anything abnormal there, but to have supposed the "Ten Quarters Coal of Bank End Pit" to be the coal known by that name elsewhere, my impression is that satisfactory evidence of this supposed unconformity will continue to be "conspicuous by its absence."

I do not hold, and, consequently, have never expressed, the theory attributed to me by Mr. Kendall as to the cause of the colour of the purple-grey rocks. With respect to the convenience of any particular views in the correlation of beds, I would only say that apparent convenience has always been a frequent cause of unsound theory.

As to my diagrams, it seems worth while to remark that a section along a single line cannot show the full dip of two highly unconformable formations at the same time.

T. V. H.

DESTRUCTION OF SWALLOWS.

THE first week of May, 1886, was fine and warm. Wind principally S. and W., the 7th being a particularly fine hot day. On the 8th the wind veered to E., rainy and cold, which continued till the 12th, when it was N.E., with rain and sleet; on the fells heavy snow and intense cold. On the 10th and 11th the swallows were first observed to be feeling the want of food and warmth, as no insects were flying during these bitter east winds. The birds had so overcome their natural timidity as to persistently seek the shelter of houses, fishermen's huts, etc., whilst others were seen clustering together in groups, sometimes as far as twenty or thirty birds: the birds as they got forced to the top of the group, sought the bottom again, and forced their way in. On the morning of the 12th many swallows, *H. rustica*, were flying so slow and wearied, that the writer could have caught them with a butterfly net. Dead birds now began to be seen and picked up everywhere in great numbers, and in almost every part of Cumberland this occurred—except the most southern portion, for which I have no data—and also in the northern portion of Westmorland. Though many dead Swifts, *C. apus*, were found on the 13th and 14th, yet they seem to have stood the cold and want of food better than the *Hirundinide*. On the 15th I visited Rockcliffe, and beneath the cliffs the ground was thickly strewn with dead birds, *H. rustica*, *C. urbica*,

and *C. riparia* being in almost equal numbers. This occurred all the way up the river side, so that the destruction must have been immense. Many of the colonies of the Sandmartin have been entirely cleared out, not a single bird being left. From both the west coast and east fells, correspondents report that they have not seen a single bird of the swallow kind since the 12th. I dissected several of the birds which I brought home, and some others which were sent to me, and found in every case the gullet and stomach devoid of food; the cause of death being want of food, accelerated by the intense cold of the 12th.

What effect this destruction of Swallows will have upon insect-life this summer, will be well worth studying; and it may be some years before we have them back again in the same numbers. The summer of 1886 may well be known as "the Swallowless summer." In a journey of thirty miles on the 20th, I did not see a single bird of the *Hirundinidæ*; and the blank to one who has been accustomed to watch them with much interest, is something indescribable.

W. DUCKWORTH.

LUMP FISH IN THE SOLWAY.

ON March 20th, 1886, I received a Lump Fish from Skinburness; it had been taken in the stream nets set to catch flounders. The fisherman who sent it had only seen three or four during a long experience. On April 3rd I received another from the same place, which was the largest I have seen, weighing five-and-a-half pounds. It was a male, and full of melt. On Good Friday, April 23rd, a friend met an angler on Burgh Marsh who had caught one while fishing with the worm. He said there was quite a shoal of them, that his line had been broken by a second, and all his tackle lost. On the Scotch side of the Solway they are known, I believe, by the name of the "Old Hen."

W. DUCKWORTH.

STURGEON IN EDEN.

ON April 17th, 1886, a Sturgeon was caught by the salmon nets at the Cargo fishery, and weighed between nine and ten stone.

W. DUCKWORTH.

PORPOISE.

A PORPOISE caught at Skinburness on May 6th, was four feet in length, two feet seven inches in circumference, and weighed about seventy pounds.

W. DUCKWORTH.

NOTES ON THE LAND AND FRESH-WATER
SHELLS OF CUMBERLAND.

IN the list of Land and Fresh-water Shells given in Part VII. of the *Transactions*, p. 54, *Planorbis vortex*, L., is recorded as being found near Stanwix. The examination of a greater number of specimens from the same locality has convinced me that the shells are not *P. vortex*, but merely a thin and flattened variety of *P. spirorbis*, Müll., which passes into the ordinary form. Through the kindness of Mr. Maddison, I have been enabled to examine a large series of specimens of the two species from the neighbourhood of Birmingham.

The two bleached specimens of *Clausilia*, from High Gelt Woods, referred to on p. 60 *loc. cit.* as *C. laminata*, Mont., I find on closer examination, and comparison with other shells, to be *C. rugosa*, var. *dubia*; the imperfect state of their preservation led to the error in their identification.

The number of species hitherto found is seventy-eight; and though the name of *P. vortex* must now be omitted, the total number remains the same, through the addition of *P. carinatus*, and there is one additional variety.

**Planorbis carinatus*. Mr. J. C. Smith, of Edenhall, Penrith, has sent me some specimens of this shell, which he has taken in a pond near Nunwick Hall, Great Salkeld. This is the first notice of the occurrence of this species in Cumberland.

P. contortus, L. This shell, which is rare in the neighbourhood of Carlisle, has been found by Mr. J. C. Smith in company with *P. carinatus*, near Nunwick Hall.

Clausilia laminata, Mont. I have received some fine specimens of this shell from Mr. J. C. Smith, which he found in the Lady's Walk, Edenhall.

J. DONALD (Carlisle).

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[The Council are indebted to Mr. R. J. Whitwell of Kendal for this Index to the "Transactions."]

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TRANSACTIONS

OF THE

Cumberland and Westmorland Association

FOR THE

*ADVANCEMENT OF LITERATURE
AND SCIENCE.*

No. XII.—1886-87.

EDITED BY J. G. GOODCHILD, F.G.S., F.Z.S.,
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION;
H.M. GEOL. SURVEY.

PRICE TO MEMBERS, ONE SHILLING.
NON-MEMBERS, TWO SHILLINGS AND SIXPENCE.



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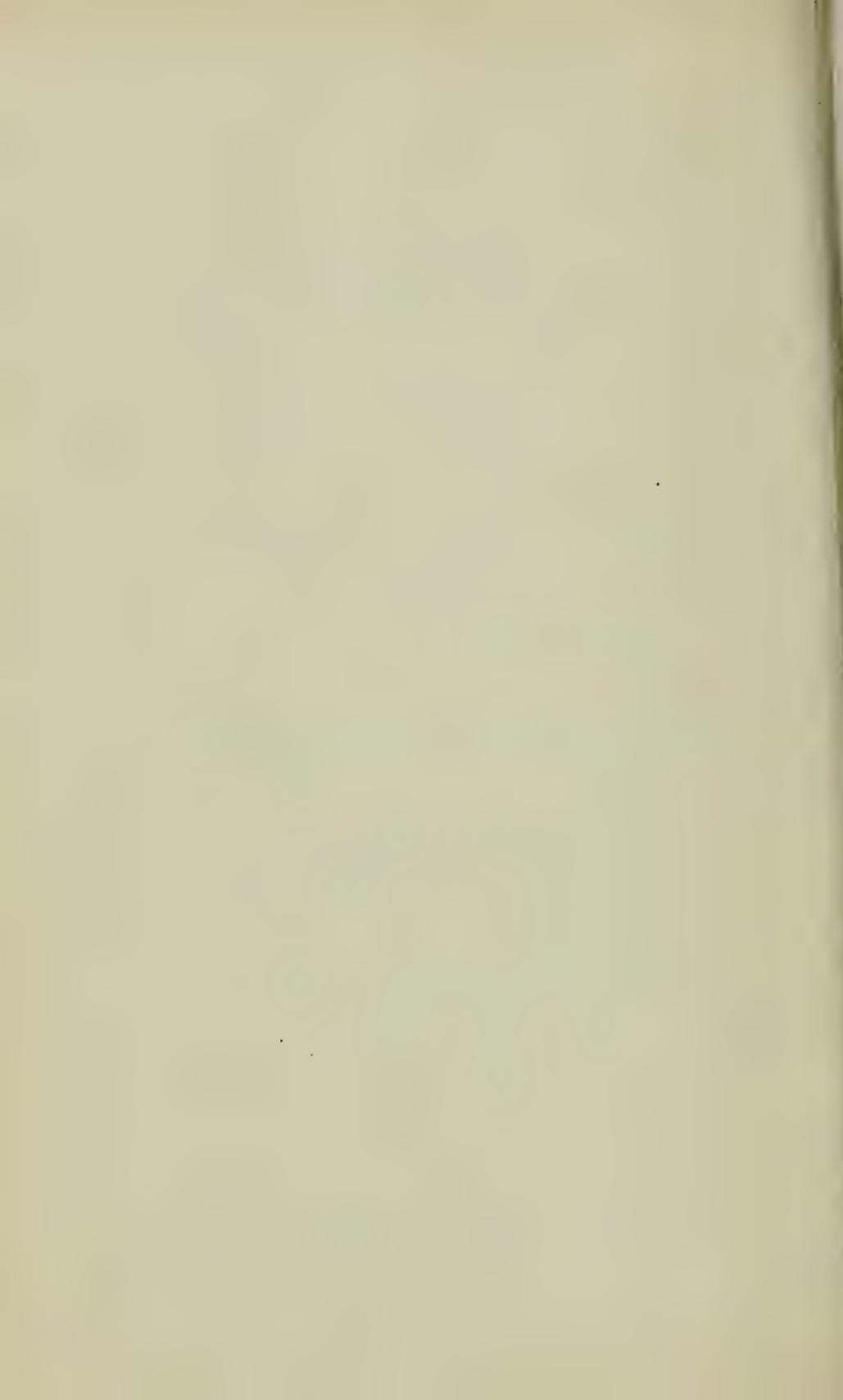
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R U L E S

OF THE

Cumberland and Westmorland Association

FOR THE

Advancement of Literature and Science.

1.—That the Association be called the “CUMBERLAND AND WESTMORLAND ASSOCIATION FOR THE ADVANCEMENT OF LITERATURE AND SCIENCE.”

2.—The Association shall consist of the following Societies :—
Keswick Literary and Scientific Society, Maryport Literary and Scientific Society, Longtown Literary and Scientific Society, Carlisle Scientific Society and Field Naturalists' Club, Ambleside and District Literary and Scientific Society, Silloth and Holme Cultram Literary and Scientific Society, Brampton Literary and Scientific Society and Field Naturalists' Club, Penrith and District Literary and Scientific Society, Windermere Literary and Scientific Society; and of such other Societies as shall be duly affiliated. Also of persons nominated by two members of the Council; this latter class of members shall pay the sum of 5s. annually.

3.—All members of affiliated Societies, unless otherwise ruled by the regulations of their respective Societies, shall be members of the Cumberland and Westmorland Association,

4.—The Association shall be governed by a Council, consisting of a President, Vice-Presidents, Secretary, who shall also be Treasurer, an Editor, and of ordinary members, two to be elected by each affiliated Society. The President, Secretary, and Editor shall be elected annually at the Annual Meeting, and shall be capable of re-election.

5.—The Vice-Presidents shall consist of the Presidents of the various affiliated Societies; and the delegates of the various Societies shall be elected annually by their respective Societies.

6.—An Annual Meeting of the Association shall be held at such time and place as may be decided upon at the previous Annual Meeting, or (failing such appointment) as may be arranged by the Council.

7.—At each Annual Meeting, after the delivery of the President's Address, and the reading of the Reports from the affiliated Societies, the objects of the Association may be furthered by Lectures, Papers, Addresses, Discussions, Conversaciones, &c.

8.—The Committee of each affiliated Society shall be entitled to recommend one original and local paper communicated to such Society (subject to the consent of the author) for publication in the *Transactions* of the Association; but Societies contributing capitation grant on a number of members exceeding one hundred and fifty shall have the privilege of sending two papers. The Council shall publish at the expense of the Association the papers recommended, either in full, or such an abstract of each or any of them as the author may prepare or sanction; also those portions of the Association Transactions that may be deemed advisable.

9.—The Council shall endeavour to promote co-operation among

existing Societies, and may assist in the formation of new ones ; it may also aid in the establishment of classes in connection with any of the associated societies.

10.—Affiliated Societies shall contribute annually towards the general funds of the Association, Sixpence for each of their members ; but when the number of members of the affiliated Societies exceeds one hundred and fifty, a reduction of fifty per cent. shall be made upon the payment for each member in excess of that number.

11.—The rules can be altered only by a majority of two-thirds of the members present at an Annual Meeting. Any member desiring to alter the Rules must send a copy of the proposed alterations to the Secretary, at least two weeks before the meeting is held.

12.—Past Presidents of the Association shall be permanent members of the Council, and be described as Past-Presidents.

13.—The travelling expenses of all who assist in carrying out the programme of the various affiliated Societies shall be defrayed by the Society assisted.

The Thirteenth ANNUAL MEETING will be held in the Summer of 1888, and due notice of the place of Meeting and of the arrangements will be sent to all members of the Association.

Members willing to contribute original *Articles* on subjects of local interest, or short *Notices* of anything that may be considered worth recording of local and scientific value, should communicate with the Honorary Secretary, J. B. BAILEY, Esq., Eaglesfield Street, Maryport.

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J. G. GOODCHILD, F.G.S., F.Z.S., M.B.O.U., H.M. Geol. Survey,
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Zoological Recorders.

Rev. H. A. MACPHERSON, M.A., M.B.O.U., 3 Kensington Gardens Square,
London, W.

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Botanical Recorders.

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		}	F. BARTON, 8 Biskey Howe Terrace, Bowness.

Reports from the Associated Societies.

KESWICK LITERARY AND SCIENTIFIC SOCIETY.

18TH SESSION, 1886-87.

<i>President</i>	...	...	...	Rev. J. N. HOARE, M.A., F.HIST.S.
<i>Vice-President</i>	...	...	...	Rev. W. COLVILLE.
<i>Secretary</i>	...	...	...	J. BROATCH.
<i>Treasurer</i>	...	...	...	EDWIN JACKSON.

Committee.

Rev. H. D. RAWNSLEY, M.A.	|	J. FISHER CROSTHWAITE, F.S.A.
Rev. J. S. OSTLE, M.A.	|	G. H. DIXON, B.A.
Rev. A. R. GODDARD, B.A.	|	T. E. HIGHTON.

Delegates to the Council of the C. and W. Association.

A. A. H. KNIGHT, M.D.		G. BLACK, M.B.
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Hon. Curators of the Museum.

JOHN BIRKETT.		J. POSTLETHWAITE, F.G.S.
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The following MEETINGS were held during the Session:—

ORDINARY MEETINGS.

1886.

Oct. 25.—PRESIDENT'S ADDRESS.

Nov. 22.—Mr. J. BROATCH.—“Oliver Goldsmith and his Works.”

Dec. 6.—Mr. G. E. LOWTHIAN.—“Combustion,” experimentally illustrated.

1887.

Jan. 31.—Mr. W. WILSON.—“Former Social Life in Cumberland and Westmorland.”

Feb. 14.—Mr. W. R. FITZPATRICK.—“Goethe and his Works.”

Mar. 21.—Mr. J. FISHER CROSTHWAITÉ, F.S.A.—“Some of the Old Families of Crosthwaite. The Brownriggs of Ormathwaite,” &c.

GENERAL MEETING.

LECTURES.

1886.

Nov. 1.—Professor BEALL, F.R.A.S.—“Buddhist Stories,” illustrated by Lantern Slides.

Nov. 8.—Rev. S. FALLE.—“Signs and Signboards of Old Inns.”

Nov. 29.—(*Health Lecture.*) Dr. J. M. FOX.—“Sanitary Progress—Past, Present, and Future.”

Dec. 13.—Rev. H. J. BULKELEY, M.A.—“The Use of Poetry.”

Dec. 20.—(*Health Lecture.*) Dr. C. GORE RING.—“Our Unseen Foes.”

1887.

Jan. 25.—Rev. J. G. WOOD, M.A., F.L.S.—“Pond Life,” illustrated by Sketches.

Feb. 7.—ERNEST MYERS, Esq.—“Lord Althorp and the Reform of 1832.”

Feb. 21.—(*Health Lecture.*) Dr. LEDIARD.—“Ventilation.”

Feb. 28.—J. G. GOODCHILD, Esq., F.G.S., H.M. Geol. Survey.—“Coral and Coral Islands.”

Mar. 15.—Rev. H. BATCHELOR.—“London English and Glasgow Scotch.”

Mar. 28.—(*Health Lecture.*) Dr. BLACK.—“Common Accidents, and How to Treat them.”

The Committee have much pleasure in presenting their annual report of the progress of the Society, which now consists of one hundred and forty-seven members as against one hundred and forty-three at the close of last Session. Including one or two members re-elected, fourteen new members have joined the Society during the past Session, and the attendances at the Lectures and Meetings have been sufficiently maintained to shew that the general interest taken in the work of the Society has not abated.

The Programme for the Session consisted of seven Ordinary Meetings and eleven Lectures, which may be classified as follows : Literary, five ; Scientific, two ; Zoological, two ; Historical and Folk-lore, five ; and a course of four Health Lectures. All the lecturers (with the exception of the Rev. H. D. Rawsley,) fulfilled

their engagements, and the Committee, who have to rely almost entirely upon voluntary effort, take this opportunity of expressing their gratitude and the indebtedness of the Society to gentlemen who (often at great inconvenience) have either contributed papers or delivered lectures to the members.

The Committee suggest that the Rev. H. D. Rawnsley be invited to deliver his lecture upon "Some Royal Mummies," as a *lecture* during the Session of 1887-88. The lateness of the present season would, they feel, prevent such an audience assembling as the subject and the lecturer deserve.

The Cumberland and Westmorland Association having fixed upon Keswick as the place of their Annual Meeting for 1886, the members assembled here on Tuesday and Wednesday, May 25th and 26th. The proceedings on the first day were somewhat marred by the unsettled state of the weather, but the excursion to Buttermere on the 26th was made under the most favourable circumstances. The Committee believe from the number of members who joined in the excursion to Buttermere that the interest in field-days and excursions, which has lately diminished, might, by an attractive programme, be somewhat revived.

The Curators of the Museum report the following additions:— Two Sand Martins, purchased by the Curators. A Stone Implement found on Rampsholme, presented by R. D. Marshall, Esq. A portion of the Butter Form used in Keswick Market in the latter part of last century. A large sheet Map of a portion of the Lake District, coloured by the late Rev. J. Clifton Ward, presented by Dr. Knight. A Map of Keswick Vale, published in 1784, presented by J. G. Goodchild, Esq. A Roman Coin issued by Claudius Cæsar, probably about A.D. 40 or 50. The Coin was found in pulling down the old buildings that stood on the site now occupied by Messrs. Henderson and Mc.Kane's shops, and is in an excellent state of preservation. Presented by Mr. J. Postlethwaite.

Mr. Peter Harrison has also presented to the Museum, through the President, a valuable collection of Skiddaw Slate Fossils.

OFFICERS FOR 1887-88. *President*—Mr. J. Postlethwaite, F.G.S. *Vice-President*—Rev. J. N. Hoare, M.A., F.R.H.S. *Hon. Treasurer*, Mr. T. E. Highton. *Hon. Secretary*—Mr. J. Broatch. *Delegates to the Council*—A. A. H. Knight, Esq., M.D., and G. Black, Esq., M.B. *Curators of the Museum*—Mr. J. Postlethwaite and Mr. J. Birkett. *Committee*—Revs. H. D. Rawnsley, M.A., W. Colville, and A. R. Goddard, B.A., Messrs. J. Fisher Crosthwaite, Edwin Jackson, and Thomas Smith.

MARYPORT LITERARY AND SCIENTIFIC SOCIETY,

ASSEMBLY HALL, HIGH STREET.

11TH SESSION, 1886-87.

<i>President</i> ...	...	...	...	...	ALFRED HINE.
<i>Vice-President</i>	P. B. MELMORE.

Past-Presidents.

J. B. BAILEY.		J. HEWETSON.		J. CARTMELL, A.M.I.C.E.
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Committee.

Rev. J. S. CRAIG.		FRED KELLY.
WILFRID HINE.		Dr. CLARKE.
C. EAGLESFIELD.		J. ROSS.
Dr. MATHIAS.		E. JAMES.
		J. B. MASON.

Delegates.

P. B. MELMORE.		D. IRVING.
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<i>Hon. Treasurer</i>	C. EAGLESFIELD, jun.
<i>Hon. Secretary</i>	D. IRVING.

The following *LECTURES* were given during the Session:—

1886.

Nov. 2.—SOCIAL MEETING. Address by President, A. HINE.

Nov. 16.—R. PICKERING, C.E.—“The Water Supplies of West Cumberland.”

Nov. 22.—R. J. BAILLIE, F.R.A.S.—“Meteors and Comets.”

Dec. 7.—J. POSTLETHWAITE, F.G.S.—“Remains of Life in the Skiddaw Slate.”

1887.

Jan. 11.—J. NEWBY HETHERINGTON, F.R.G.S.—“The Rise of Prose Fiction, or the Romances of Olden Times.”

Jan. 25.—A. G. BENNETT, C.E.—“The Telephone.”

Feb. 8.—Rev. W. SHERWEN, M.A.—“A Week in Belgium.”

Feb. 15.—J. B. BAILEY.—“Another Chapter in the History of Maryport.”

Feb. 22.—J. G. GOODCHILD, H.M.G.S.—“Coral and Coral Reefs.”

Mar. 8.—Rev. W. T. HERD.—“Five days in Venice.”

LONGTOWN LITERARY AND SCIENTIFIC SOCIETY.

10TH SESSION, 1886-87.

President Rev. J. R. GIBSON.

Vice-Presidents.

R. A. ALLISON, M.P.
Rev. P. CARRUTHERS.
S. F. Mc.LACHLAN, M.B.

WM. EASTON-ROBERTSON.
Rev. WM. LYTTEIL, M.A.
JNO. WILSON.

Treasurer and Secretary WM. JARDINE.

Committee.

I. RIGG.
A. P. WILKIE.

Dr. LEIGH-GILCHRIST.

A. TWEDDLE.
J. G. ELLIOTT.

Sub-Committee.

Mrs. WANNOP.
Mrs. Dr. TAYLOR.

Miss A. RIGG.
Miss L. FARRIES.

Delegates.

Dr. Mc.LACHLAN.

W. JARDINE.

The following MEETINGS were held during the Session:—

1886.

- Nov. 2.—Inaugural Tea Meeting. Speeches interspersed with Music.
 Nov. 9.—Mr. ROBERT HORNSBY.—“Agriculture: its Antiquity, Progress, and Importance.”
 Nov. 16.—Rev. C. J. SENIOR.—“Frances Ridley Havergal’s Life and Writings, illustrated by her Songs.”
 Nov. 23.—Rev. GEO. LAMBERT.—“Pompeii and its Remains.”
 Nov. 30.—Debate: “Can Hood rank with Burns as a poet?” *Affir.* Mr. WILSON; *Neg.* Mr. WILKIE.
 Dec. 7.—Rev. J. R. GIBSON.—“Co-operation: Distributive and Productive.”
 Dec. 14.—J. M. PAULL, Esq., F.G.S.—“Reminiscences, &c., of a lengthened sojourn in the Alps.”
 Dec. 21.—Mr. WILKIE.—“An Evening with Carlyle.”
 Dec. 28.—Special Arrangements.

1887.

- Jan. 4.—Special Arrangements.
 Jan. 11.—Rev. J. PHELPS.—“The Importance of Little Things.”
 Jan. 18.—Debate: “Are our Houses and their Furnishings adapted for Health and Comfort?” *Affir.* Mr. W. JARDINE; *Neg.* Mr. WILSON.
 Jan. 25.—Rev. W. LYTTELL, M.A.—“Old Border Life.”
 Feb. 1.—Mr. WILSON.—“Paper: its Manufacture and Uses.”
 Feb. 8.—Mr. F. HARRISON.—“Old Cumberland Customs.”
 Feb. 15.—W. E. ROBERTSON, Esq.—“Border Heroes.”
 Feb. 23.—J. G. GOODCHILD, Esq., F.G.S., H.M. Geol. Survey.—“Hawks and Hawking.”
 Mar. 1.—Rev. H. M. JOYCE.—“Carlisle in Olden Times.”
 Mar. 8.—Debate: “Is the Crofter System a good one?” *Affir.* Rev. W. LYTTELL; *Neg.* Rev. J. R. GIBSON.
 Mar. 15.—WM. BATY, Esq.—“Plantations: their Beauty and Utility.”
 Mar. 22.—Rev. J. WALLACE, M.A.—“The Jewish Sanitary Customs.”
 Mar. 29.—S. F. Mc LACHLAN, Esq., M.B.—“Frank Buckland, Naturalist.”
 Apr. 5.—Mr. J. G. ELLIOTT.—“Light.”
 Apr. 12.—Business of the Society, Election of Officers, &c.
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CARLISLE SCIENTIFIC SOCIETY AND FIELD
NATURALISTS' CLUB.

10TH SESSION, 1886-87.

President Rev. C. H. PAREZ, M.A.

Past-Presidents.

The Right Rev. the LORD BISHOP OF CARLISLE.
ROBERT FERGUSON, F.S.A. | MILES MACINNES, M.P.
R. S. FERGUSON, M.A., F.S.A.

Vice-Presidents.

S. J. BINNING. | Dr. CARLYLE.
Treasurer ROBERT CROWDER.
Hon. Secretary JOHN SINCLAIR, 6 Hawick Street.

Committee.

R. J. BAILLIE.	|	F. HARRISON.
ISAAC CARTMELL.	|	T. DUCKWORTH.
J. A. WHEATLEY.	|	W. DUCKWORTH.
ROBT. CROWDER.	|	R. M. HILL.
DR. MACLAREN.	|	GEO. DAWSON.
DR. BARNES.	|	DR. LEDIARD.

The following LECTURES, &c., have been given during the Session:—
1886.

- Nov. 1.—Inaugural. Rev. C. H. PAREZ, M.A., (*President.*)—"Eyes."
Nov. 16.—Dr. CARLYLE—"Club Fungi."
Nov. 30.—J. A. WHEATLEY, Esq.—"Precious Stones."
Dec. 14.—Mr. E. F. BELL—"Roman Coins."
Dec. 28.—Rev. CANON RICHMOND—"Sir Joshua Reynolds and his Works."
1887.

- Jan. 11.—Mr. THOS. DUCKWORTH—"Summer Visitors." Part 3.
Jan. 26.—Rev. J. G. WOOD, Author of Natural History—"Insect Transformation."
Feb. 8.—Rev. H. A. MACPHERSON and Mr. W. DUCKWORTH—"Zoological Notes and Record for 1886."
Feb. 24.—J. G. GOODCHILD, Esq., F.G.S., H.M. Geol. Survey—"Coral and Coral Islands."

Mar. 8.—Mr. WM. HODGSON, A.L.S.—“Seaside Botany, St. Bees to Bowness.”

Mar. 22.—Rev. H. WHITEHEAD.—“Prince Charles Stuart at Brampton, 1745.”

Apr. 5.—Mr. F. HARRISON.—“Effects of Cultivation on Scenery.”

About one hundred copies of the Transactions have been distributed free to the Members.

AMBLESIDE AND DISTRICT LITERARY AND SCIENTIFIC SOCIETY.

10TH SESSION, 1886-87.

President Rev. E. M. REYNOLDS

Past-Presidents.

R. CREWDSON. | Rev. H. S. CALLENDER.

Vice-Presidents.

F. M. T. JONES. | G. GATEY.

Treasurer W. LISTER.

Secretary J. BENTLEY.

Delegates.

C. W. SMITH. | J. BENTLEY.

Committee.

<p>T. BELL. Rev. C. H. CHASE. J. FLEMING. J. HIRD. E. HIRD.</p>		<p>W. E. PERCIVAL. H. REDMAYNE. J. RUSSELL. —STALKER, Senr. C. W. SMITH.</p>
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The following MEETINGS were held during the Session:—

1886.

Oct. 26.—F. GALE, Esq.—“Stories and Short Readings.”

Nov. 9.—Rev. J. BRUNSKILL, M.A.—“Pleasures of Horsemanship.”

Nov. 23.—Rev. J. N. HOARE, M.A., F.R.H.S.—“Religion of the Ancient Egyptians.”

- Dec. 7.—W. PECK, Esq., F.R.A.S.—“The Planets and their Satellites.”
 Dec. 21.—G. E. LOWTHIAN, Esq.—“Various Forms of Water,” experiments.
 1887.
 Jan. 18.—Rev. J. G. WOOD, M.A.—“Pond and Stream.”
 Jan. 26.—W. H. GOLDING, Esq.—“A Trip to the Hebrides.”
 Feb. 15.—C. E. PAGET, Esq.—“Some Values of Death Statistics.”
 Mar. 1.—T. MACKERETH, Esq., F.R.A.S., F.R.Met.Soc.—“The Law of Storms.”
 Mar. 15.—W. RENTON, Esq.—“Thackeray.”
 Mar. 29.—Debate on “Emigration.”
 ANNUAL MEETING ; Election of Officers.

SILLOTH AND HOLME CULTRAM LITERARY
 AND SCIENTIFIC SOCIETY.

8TH SESSION, 1886-87.

President J. M. PAULL, F.G.S.

Vice-Presidents.

H. L. BARKER. | JOHN LEITCH, M.B., C.M.

Committee.

Rev. J. BROWN, M.A.	|	Rev. S. HEBERT, M.A.
G. T. CARR.	|	W. M. HUDSON.
W. CRABB.	|	J. MADAGAN.
JOHN GLAISTER.	|	JOHN GRAHAM.
W. F. WILSON, J.P.		

Hon. Treasurer J. STRONACH.

Hon. Secretary J. B. BINKS.

The following MEETINGS were held during the Session :—

1886.

- Oct. 13.—J. M. PAULL, F.G.S.—Inaugural Address by the President.
 Oct. 27.—R. J. BAILLIE, F.R.A.S.—“The Earth’s History,” from a Scientific Point of View.
 Nov. 10.—Rev. S. HEBERT, M.A.—“A Journey through the Solar System,” illustrated by Diagrams.
 Nov. 24.—JOHN GLAISTER.—“The Honey Bee.”

- Dec. 9.—Rev. WILLIAM NALL, M.A.—“The Geological Record.”
 Dec. 15.—Rev. G. W. H. TAYLER.—“The Reign of Terror in France, 1793,” &c.
 1887.
 Jan. 12.—J. NEWBY HETHERINGTON, F.R.G.S.—“The Revival of English Poetry after the French Revolution.”
 Jan. 26.—Rev. W. A WRIGLEY.—“Michael Faraday.”
 Feb. 9.—Dr. H. J. WEBB, Agricultural College, Aspatria.—“The Origin and Life History of some Parasites.”
 Feb. 25.—J. G. GOODCHILD, F.G.S., H.M. Geol. Survey.—“Coral and Coral Reefs.”
 Mar. 9.—J. J. MARTIN.—“G. R. Sims.”
 Mar. 23.—Rev. H. M. TODD, M.A.—“America.”

BRAMPTON LITERARY AND FIELD NATURALIST SOCIETY.

SESSION 1886-87.

President G. J. JOHNSON.

Vice-Presidents.

Rev. S. FALLE. | Rev. H. J. BULKELEY.

Treasurer... .. J. B. LEE.

Hon. Secretary G. WARWICK, Back Street.

Committee.

Mr. FARRAR.	|	Mrs. H. Y. THOMPSON.
Mr. FORSTER.	|	Miss BELL.
Mr. HODGSON.	|	Miss EMMA LEE.
Mr. J. NIXON.	|	Miss MACQUEEN.
Mr. RIGG.	|	Miss THOM.

The following MEETINGS were held during the Session:—

1886.

- Oct. 19.—Rev. S. FALLE.—“Parson Lot—Chartist, Writer, and Preacher.”
 Nov. 2.—Shakespearian Reading—“As you like it.”
 Nov. 9.—Rev. CANON MATTHEWS.—“Our Forefathers.”
 Nov. 23.—Rev. J. S. OSTLE.—“Notes on the Cumberland Dialect.”
 Dec. 7.—Debate: “On the best ways of continuing Education after leaving School.”
 Dec. 21.—Mr. WILSON.—“Social Forces.”

1887.

- Jan. 11.—CONVERSAZIONE.—Natural History Exhibition.
 Jan. 27.—Rev. J. G. WOOD.—“Unappreciated Insects.”
 Feb. 8.—Rev. H. J. BULKELEY—“Eminent Persons who died in 1886.”
 Feb. 22.—Rev. CANON COOPER.—“The Poetry of Tennyson.”
 Mar. 8.—J. G. GOODCHILD, F.G.S., H.M. Geol. Survey.—“The Lion and his Kindred.”
 Mar. 22.—Short Papers.

PENRITH AND DISTRICT LITERARY AND SCIENTIFIC SOCIETY.

6TH SESSION, 1886-87.

President GEORGE WATSON.

Vice-Presidents.

J. G. GOODCHILD, H.M. Geo. Survey, F.G.S., F.Z.S.
 Rev. H. WHITEHEAD, M.A.

Past-Presidents.

M. W. TAYLOR, M.D., F.S.A. | Major W. B. ARNISON.
 Rev. E. W. CHAPMAN, M.A.

Secretary H. M'LEAN WILSON, M.B., C.M.
Treasurer J. B. SHAWYER.

Delegates.

Major W. B. ARNISON | G. WATSON.

Committee.

W. B. ARNISON.	|	C. H. GRAHAM.
Rev. E. W. CHAPMAN.	|	F. KING.
Rev. W. M. SCHNIBBEN.	|	E. H. KEED, M.A.
T. LESTER.	|	Rev. J. N. MARSH, M.A.
J. THOMPSON.	|	J. SIMPSON YEATES.

Curator of Museum CHARLES SMITH.
Librarian J. STUART.

The following MEETINGS were held during the Session:—

1886.

- Nov. 4.—ANNUAL GENERAL MEETING and CONVERSAZIONE.
 Nov. 18.—W. PECK, Esq., F.R.A.S.—I. “The Sun.”
 Dec. 2.—, , —II. “The Planets and their Satellites.”
 Dec. 16.—, , —III. “The Moon.”
 Dec. 23.—, , —IV. “Comets and Shooting Stars.”
 Dec. 30.—Prof. H. A. NICHOLSON.—“The History of Evolution.”

1887.

- Jan. 6.—W. PECK, Esq.—V. “The Stellar Universe.”
 Jan. 13.—T. FAWCETT, Esq., B.A.—“The Earthworm: Its Place and Work in Nature.”

- Jan. 20.—T. N. HETHERINGTON, Esq.—“Chaucer, the first English Humorist.”
- Jan. 27.—J. THOMPSON, Esq.—“Something about English Pronunciation.” Part I.
- Feb. 3.—J. THOMPSON, Esq.—“Something about English Pronunciation.” Part II.
- Feb. 10.—Rev. J. SHARPE OSTLE, M.A.—“C.S.C.”
- Feb. 24.—T. G. BENN, Esq., F.R.M.S.—“Meteorology; or Weather Knowledge: Its Progress and Modern Aspects.”
- Mar. 10.—E. H. KEED, Esq., M.A.—“Matthew Arnold.”
- Mar. 24.—Rev. J. J. STOCKLEY, B.A.—“George Eliot.”

WINDERMERE LITERARY AND SCIENTIFIC SOCIETY.

5TH SESSION, 1886-87.

<i>President</i>		H. W. SCHNEIDER
	<i>Vice-Presidents.</i>	
E. P. STOCK.	|	B. A. IRVING
	<i>Secretaries.</i>	
W. C. MACDOUGALL	-|	FRANK BARTON
<i>Treasurer</i> ... ..		... JOHN HOLLAND
	<i>Delegates.</i>	
G. HEALEY.	|	T. THOMPSON

The following MEETINGS were held during the Session:—

1886.

- Oct. 25.—Mr. FREDERICK GALE.—“The Writings of Dickens and Thackeray.”
- Nov. 8.—Mr. JOHN BUTTERWORTH, F.R.M.S.—“On the Structure of Fossil Plants in the Lancashire and Yorkshire Coal Measures.”
- Nov. 22.—Mr. W. D. CREWDSON.—“The Norman Conquest: its Influence on Modern England.”
- Dec. 6.—Rev. H. D. RAWNSLEY.—“The Need of Preserving our Footpaths and Roadside Wastes.”
- Dec. 20.—Rev. G. E. P. READE.—“Lord Bacon.”

1887.

- Jan. 9.—Professor FRANK CLOWES.—“The Germ Theory.”
- Jan. 21.—Rev. J. G. WOOD.—“The Whale.”
- Feb. 14.—Miss MACKERETH.—Dramatic Recitals.
- Feb. 28.—Mr. B. A. IRVING.—“Some Natural Phenomena.”
- Mch. 14.—Rev. G. CREWDSON.—“Some Modification of the Organs of the Mouth in Insects.”

Report of the Association Secretary,

FOR THE YEAR 1886-87.

THE past year has not presented many features of interest. The Council regret to observe that, chiefly owing to the withdrawal of the Whitehaven Scientific Association from the Union, the number of its associated Members has been reduced from 1283 to 864. The number of copies of *Transactions*, No. XI., sold to Societies, is 435, against 506 last year—the Penrith, Carlisle, Keswick, and Maryport Societies having bought 385 copies, leaving only 50 copies sold to the remaining five Societies with an aggregate membership of 333. There has been a fair demand for back numbers of *Transactions*, some of which are now very scarce.

The plan approved of by the Council of assisting the Committees of affiliated Societies in the compilation of their Programmes by the formation of a list of voluntary Lecturers has not yet been adopted; but if a sufficient number of gentlemen consent to allow their names to appear on such a list, along with the subjects of the papers they propose to treat of, there seems no reason why such a scheme should not prove advantageous in many respects, affording as it would a large field of subjects for the selection of local Committees.

The Association Lecturer (the Rev. J. G. Wood, F.L.S., &c.,) delivered a highly interesting series of Lectures on Natural History before several of the Societies during the winter.

It is a matter of congratulation that, in spite of the diminished membership, the accounts for the year show a small balance in hand.

Society	No. of Members on whom Grant is paid	Copies taken of No. XI.	Terms
Carlisle	104	95	Free to Members
Penrith	169	160	Free to Members
Maryport	90	60	Free to Gentlemen, Ladies at 1/
Keswick	145	70	To Members at 1/
Ambleside	93	20	To Members at 1/
Windermere	62	0	
Brampton	67	10	To Members at 1/
Longtown	46	12	To Members at 1/
Silloth	65	8	To Members at 1/
Association Members	23	23	At 1/
Total	864	458	

Cumberland and Westmorland Association for the Advancement of Literature and Science.

BALANCE SHEET FOR THE YEAR ENDING APRIL 30, 1887.

1885-86. RECEIPTS.	1885-86. PAYMENTS.
Balance brought forward £36 18 7	Messrs. Coward for Printing
Arrears of Grant ... 0 12 6	No. X. ... £28 16 6
Arrears of Subscriptions ... 0 12 0	Do. for Carriage of <i>Trans.</i> 0 13 1
<i>Trans.</i> No. X. sold to Socs. 1 10 0	Do. for Circulars, Station- ery, &c. ... 1 1 8
,, sold by G. & T. Coward 1 5 6	Expenses of Windermere
Authors' Copies ... 2 6 0	Meeting ... 5 10 7
1886-87.	Authors' Copies... .. 3 0 6
Cap. Grant on 662 Members 16 6 3	Secretary's Postage Account 0 16 11
Subs. of 14 Assoc. do. 4 3 0	Editor's Postage Account... 0 15 0
<i>Trans.</i> No. XI. sold to	Towards buying back scarce
Societies (295) ... 14 15 0	Numbers ... 1 0 0
Back Numbers sold ... 0 8 6	1886-87.
Non-Members' Tickets sold	Part Expenses of Keswick
at Keswick ... 2 10 6	Meeting ... 4 18 0
Bank Interest ... 0 6 0	Grant for Expenses of Associ- ation Lecturer (Rev. J. G. Wood) ... 5 5 0
	Bal. in hand April 30, 1887 29 16 7
£81 13 10	£81 13 10

Examined and found correct, November 8th, 1887,

JAMES A. WHEATLEY, }
HENRY BARNES, M.D., } *Auditors.*

1885-86. ASSETS.	LIABILITIES.
Balance brought down £29 16 7	Messrs. Coward for Printing
Grant due on 12 Members 0 6 0	No. XI. ... £35 5 9
Subscriptions due (3) ... 0 18 0	Do. for Postages of <i>Trans.</i> 0 16 10½
1886-87.	Do. for Circulars, Station- ery, &c. ... 1 10 3
Grants due on 179 Members 4 9 6	Expenses of Keswick M'ting 5 3 11½
Subscriptions due (9) ... 2 14 0	Due for Authors' copies ... 3 6 3
<i>Transactions</i> No. XI. sold	Secretary for Postages ... 1 4 2
to Societies (140) ... 7 0 0	Editor for Do. ... 0 16 0
Back Numbers sold to do. 0 12 0	To buying in scarce Numbers 1 0 0
Do. sold by Messrs. Coward 4 18 6	Balance in hand ... 5 4 10
Due for Authors' copies	
(No. XI.) ... 2 9 6	
Due for Paper in No. X. ... 1 4 0	
£54 8 1	£54 8 1

TRANSACTIONS, PART XI.

Sold to Societies	435
Sold to Association Members	23
Presented	41
Sold	6
On hand April 30, 1887	195

Total 700 copies.

LIST OF PUBLICATIONS OF SOCIETIES
RECEIVED BY THE ASSOCIATION IN EXCHANGE
FOR THE *TRANSACTIONS*.

- 1 United States Geological Survey Annual Reports for 1880-81, 1881-82, 1882-83, 1883-84, 1884-85.
- 2 Transactions of Yorkshire Naturalists' Union for 1882, 1883, and 1884.
- 3 Do. of Essex Field Club, 1883-84, and 1887.
- 4 Do. of Bristol Naturalists' Society, 1882-83, 1883-84, 1884-85, 1885-86, 1886-87.
- 5 Do. of Burnley Literary and Scientific Club for 1883, 1884, 1885.
- 6 Do. of Berwickshire Naturalists' Club for 1882, 1883, 1884, 1885, 1886.
- 7 Do. of the Midland Union of Natural History Societies for 1881, 1882, 1883, 1884, 1885, 1886, 1887.
- 8 The Proceedings of the London Geological Society for 1880-81, 1881-82, 1882-83, 1883-84, 1884-85, 1885-86, 1886-87.
- 9 Transactions of the Birmingham Natural History and Microscopical Society for 1883 and 1884.
- 10 The Memoirs of the Geological Survey, Vols. 1 & 2 (Pts. 1 & 2).
- 11 Do. do. do. Decades 1 to 13.
- 12 Mineral Statistics of the United Kingdom, 1864 to 1873.
- 13 Iron Ores of Great Britain, Parts 2 and 3.
- 14 The Geology of Londonderry (Portlock).
- 15 Guide to the Geology of London (Whittaker).
- 16 Catalogue of Models in Jermyn Street Museum.
- 17 Do. of Publications of the Geological Survey (1884).
- 18 Transactions of the Hertfordshire Natural History Society for 1886 and 1887.
- 19 Do. of the Norfolk and Norwich Naturalists' Society, 1884-85.
- 20 L'exposition Géographico-Botanique de Copenhague (MS.).
- 21 Vol. 2 (No. 1) Memoirs of the Geological Society of Russia.
- 22 Proceedings of the London Geologists' Association, Nos. 1 and 2, for 1887.
- 23 Proceedings of the Canadian Institute for 1885-86.
- 24 Transactions of the Stirling Nat. Hist. and Archæological Society for 1885-86.
- 25 Memoir of Professor Harkness, F.G.S.
- 26 Twenty-six Pamphlets on Geological Subjects, by Prof. Harkness.

THE MARYPORT CAMP—WHAT WAS ITS NAME?

BY J. J. BAILEY.

(*Read at Maryport.*)

THREE years ago, when I read a paper before this Society, on "The Maryport Camp—Who was its Founder?"* I thought that I had at last completed my work. Not that the series was a perfect one, or that I had exhausted all that might be said on the history of Maryport—but that I had at last reached a subject which, having puzzled the antiquarian world so long, presented but small chance that its intricacies should be unravelled by me. But a way out of the difficulty has appeared, and it seems but fair that, having gone so far in the matter, I should follow up the clue obtained, and thus add another chapter to the ancient history of our town. I allude to the *name* of the station. You may say that this is a matter of little or no importance, and you may be right. But there is also a sense in which you would be wrong; for should I be able to prove the points which I shall bring forward, the issues will be great: for then a matter which for generations has puzzled antiquarians will be set at rest. Even should certainty not be attained, I am not without hope that the way will be opened out for a clearer understanding of the subject.

It may seem presumptuous my saying anything when so many eminent authorities have decided without the slightest shadow of a doubt that that name was AXELODUNUM. But names have been before this given to stations, and although the allocations were

* *Transactions*, Part IX., p. 67.

advanced with perfect confidence, yet such have been withdrawn as more light dawned on the subject. With all due deference to those authorities who decide in favour of *Axelodunum*, I am unable to see the drift of the argument by which they have arrived at their conclusion, viz.—that “the altars found prove it to be so;” and hence think it not unprofitable to discuss the question.

Although many eminent authorities decide for *Axelodunum*, it must be remembered that there is far from a consensus of opinion on the matter even amongst antiquarians still living, as no less than at least five names have been applied to the station.

These names, alphabetically arranged, are:—*AXELODUNUM*, *GLANOVENTA*, *OLENACUM*, *VIROSIDUM*, *VOLANTIUM*.

Taking each of these names in order, we shall show to what different places each of them has been applied, together with some of the authorities favouring such allocation. Thus:—

<i>AXELODUNUM</i>	is placed at <i>Maryport</i>	by Professor Hübner, R. S. Ferguson, W. T. Watkin, and W. H. D. Longstaffe.
”	”	<i>Hexham</i> by Camden.
”	”	<i>Stanwix</i> by Mc. Lauchlan. (I am inclined to think this is the proper name.)
”	”	<i>Bowness</i> by Godwin.
”	”	<i>Burgh</i> by Horsley, Wright, Dr. Bennet, Hutchinson.
”	”	<i>Watchcross</i> by Maughan.
”	”	<i>Drumburgh</i> by Hodgson and Dr. Hooppell.

Speaking of this name, Dr. J. Collingwood Bruce expressly says, “*Axelodunum* cannot be *Maryport*; it must, from its order of sequence in the *Notitia*, be situated on the Wall itself, and east of *Bowness*.”* Whilst, without committing himself to the opinion, he says further, “The idea is beginning to be entertained by some, that *Maryport* was the *Axelodunum* of the *Notitia*.”†

* *Trans. Cumb. and West. Antiq. and Arch. Soc.*, vol. I, p. 175.

† *Lapidarium Septentrionale*, p. 394.

We shall have more to say shortly regarding this name—a name for which, as I have shown, there are at least seven claimants.

GLANOVENTA is placed at	<i>Lanchester</i>	by Horsley and Hodgson.
”	”	<i>Bowness</i> by Mc.Lauchlan.
”	”	<i>Tynemouth</i> by Dr. Hooppell.
”	”	<i>Ravenglass</i> (?) and <i>Old Carlisle</i> by R. S. Ferguson.
”	”	<i>Kirksteads</i> by Maughan.
”	”	<i>Whitley Castle</i> by W. H. D. Longstaffe.
”	”	<i>Morpeth</i> by Camden.

Dr. Bennet shows that in his time an opinion prevailed which apparently favours *Maryport* “as not unsuitable to the position of that town in the 10th Iter of Antoninus.”* Baines† says it was *Cockermouth*, or some place on the coast of Cumberland; whilst the writer of the article in “History, &c., of West Cumberland,” p. 24, says *Maryport* is Glanoventa.

OLENACUM is placed at	<i>Maryport</i>	by Camden.
”	”	<i>Old Carlisle</i> by Horsley, Hodgson, Wright, Mc.Lauchlan, Godwin; and I am inclined to think this is the correct name.
”	”	<i>Burgh</i> by R. S. Ferguson.
”	”	<i>Ilkley</i> by Hodgson Hinde.
”	”	<i>Drumburgh</i> by Maughan.
”	”	<i>Blackrode</i> by W. H. D. Longstaffe.

VIROSIDUM is placed at	<i>Maryport</i>	by Horsley, Hodgson, Hutchinson, Wright, Mc.Lauchlan, Godwin.
”	”	<i>Warwick</i> by Camden.
”	”	<i>Gateshead</i> by Dr. Hooppell.
”	”	<i>Adel</i> (Yorks.) by Hodgson Hinde.
”	”	<i>Stanwix</i> by R. S. Ferguson.
”	”	<i>Warrington</i> by W. H. D. Longstaffe.
”	”	<i>Bowness</i> by Maughan.

* Lyson's Cumberland, p. cxlii. † Hist. Yorkshire, vol. 1, p. 331.

VOLANTIUM is not a name met with in any of the lists that have come down to us. It has been inferred merely from the words "*Volanti Vivas*" on the back of the altar by Marcus Censorius Cornelianus. So very unlikely is this name, unsupported as it is by evidence of any kind, that we may at once dismiss it from further consideration.

Thus no name meets with universal approval. Why should this state of things exist? for even *living* authorities are not agreed. Apparently it is because antiquarians are not decided as to the method by which they shall allocate the names; at any rate, so far as the twenty-three stations "*per lineam valli*" are concerned. One has one theory, another has a different one. One decides by etymology, another by the resemblance of sounds, a third by probability; whilst others consider that the matter is decided by the altars found at any of these twenty-three stations, in so far as they agree with the list in the Notitia.

Can any agreement be made out of such a chaos? or shall we strike out on a fresh line? Etymology is far from being a safe guide; in fact, it has been stated to be the least satisfactory method by which an allocation can be made, though, under certain conditions, it may be of more use than we are likely at present to allow. The mere similarity of sounds is no criterion. But, when we come to the finding of altars, this is a different matter, and will require careful consideration.

The Notitia, of which I have already spoken, was the Military and Civil Service List of the Roman Empire. Its full title is:—"Notitia Dignitatum et Administrationum omnium tam civilium quam militarium in partibus orientis et occidentis."

In this list we have in Chapter 63 a list of twenty-three stations in connection with what is usually called the Roman Wall. Probably the term *per lineam valli* does not apply merely to the Roman Wall itself, for it apparently includes not only the stations actually on the line of the Wall, but also others in its immediate neighbourhood, and necessary for its proper defence.

That the Maryport Camp, under whatever name it was known, was one of these Notitia stations, is pretty generally admitted,

seeing that, putting aside the name Volantium, all the names applied to it are in this list. In fact, we might almost infer, from its commanding position, its connections, its antiquities, etc., that such would be the case. Now it is clear that *all* the names cannot be applied to the station, if indeed any of them can.

Let us then take the first name on our list, viz., AXELODUNUM, and enquire (1) on what grounds this name has been given, and (2) whether such reasons are satisfactory.

The Notitia says that the First Cohort of the Spaniards was stationed at Axelodunum. At Maryport, the spade of the antiquary has unearthed some sixteen altars by these Spaniards. Hence the inference has been drawn that therefore Maryport is Axelodunum; and, on the face of it, this inference seems clearly the correct one. But, we might ask whether we should be absolutely certain that the mere finding of altars, even if taken in connection with the Notitia, is proof positive. For my own part, I cannot see that this fact taken *per se* can satisfactorily establish a claim; for if it could do so, then other places might have an equal claim. As it is, the First Cohort of the Spaniards has left its record at Netherby, at Ardoch,* and in North Britain,† besides Maryport.

Clearly the Scotch stations are out of the running; but the claims of Netherby might be more tangible.

Besides, if the number of altars is to be the main element, then Maryport has the prior claim only so long as it maintains its position in the front in this respect. In the same way any other place near the Wall might, under like conditions, step into the front rank: for who can say that *all* the Spanish altars have been found? Yet again, how is the matter to be decided when altars by *two* of the cohorts named in the Notitia have been found in a station, as has been the case at Moresby? Clearly there would in this case be a difficulty. Surely there *must* be a more satisfactory method of allocation than this. A very simple argument will show how very unreliable this method really is. Suppose a cohort to be stationed at Maryport, and to signify its presence there by erecting

* Celt, Roman, Saxon, p. 384. † Ibid p. 335.

an altar. Suppose also that this same cohort has been likewise stationed at Bowness, its presence there being testified to simply by a statement in a book or official list. Suppose further, that after a lapse of say fifteen hundred years, the site of each place has become totally unknown. An antiquarian, however, reading the book or list, is desirous of finding out where Bowness was situated, but all his attempts fail—etymology, sound, probability, *all* are of no use in solving the difficulty. But a time comes when, probably accidentally, the altar is found at Maryport. At once there is agreement with the book; the two things are put together, and the inference is drawn that the site of Bowness has at last been discovered. But it is manifest that the inference is clearly erroneous.

May it not, then, be the case that the Roman altars discovered at Maryport point *erroneously* to the name Axelodunum? Surely something more tangible than this is necessary in order that the chain of evidence may be complete. But, in saying this much, we must allow that *all* writers do not credit the mere finding of altars, even though backed up by the authority of the Notitia, as sufficient to settle definitely the name of a station. An examination of the list of authorities mentioned above will show that the great majority of them wrote before “the great find” of altars at Maryport in 1870. In this case it will be well to examine what new factors were introduced by this “find,” in order to determine whether such should necessitate a reversal of the opinions expressed by them, inasmuch as those who give their authority in favour of Axelodunum, have chiefly written *since* 1870.

In the first place, let it be granted that the number of altars dedicated is not the chief factor, but rather the number of officers or cohorts dedicating. One altar is of equal value with twenty, if all bear the same name. We then come to this:—Previous to 1870 there were found four Spanish altars, bearing the names of four different commanders. The aggregate value of these altars would therefore be four. In 1870 there were found amongst other altars, &c., eleven Spanish altars dedicated by five officers, three of whom were the same as on the altars found previous to 1870.

Thus the "find" of 1870 added merely two fresh names to the list, and therefore, although a marvellous find in itself, its value as an aid to determining the name of the station is not eleven, but two merely over and above what the older antiquarians possessed. Besides, when so many names have been decided "on the Wall" merely on the testimony of *one* altar, surely the testimony of the four names on the four altars found previous to 1870 ought to have been more decisive, if indeed they could have decided it. Evidently the antiquarians of that date thought differently, and as evidently many antiquarians of the present day think with them. We might very appropriately ask if there is any absolute necessity that there should be any Spanish altars at the real Axelodunum at all? Surely there must be great uncertainty in this matter, unless indeed it was a necessary part of their duty to commemorate their presence at a station in this manner.

That the Spanish Cohorts were at Axelodunum, wherever it was, the Notitia places beyond doubt; but it by no means follows that they therefore left their *altars* at that place. If this be so, it will be clear that the evidence of altars, even under circumstances already mentioned, is but a very uncertain guide.

Dr. Bruce, speaking of this state of affairs says, "In this state of uncertainty it will be better for us to forbear attempting to give to the Camps we meet with their ancient designation. In due time the key may be found, which, without the application of force, will send back the bolt, and make all plain, till then we must be careful to confess our ignorance."*

To my mind *the key* will be found in the following plan, which will, at any rate disprove a name, if it does not prove it. Where it can be proved by altars or otherwise, that the cohorts were stationary in any camp for a long succession of years, especially during the last two hundred years of the occupation, we have a certain degree of presumptive evidence that they were present at that station in or near Notitia times, and hence we might fairly assume the name in connection with the Notitia.

Failing this method, let the various lists of stations extant be

* Lapidarium Septentrionale.

carefully tabulated, so as to note where there is correspondence and where variance. Should we do this, we may doubtless get a tolerably correct sequence of places, which would prove most valuable in determining the name.

Let us examine the case as regards the Maryport Camp under each of these heads, but first with regard to continuity. That the Spanish Cohorts have been in residence at Maryport no one can deny, the altars most certainly decide this. By the aid then of these altars, together with others found elsewhere, we shall be able to prove without the slightest difficulty that the Spanish Cohorts at Maryport were not stationary, but, on the contrary, that they frequently changed their quarters, at any rate during the earlier years of the Roman occupation. This much is owned by Dr. Bruce, who says that "the diversity of troops named on them (i.e., the Maryport altars,) shows that a quicker exchange took place here at that time than was usual."*

The only words requiring explanation here are, "at that time." When was it? Four, if not five of the altars discovered were dedicated by Marcus Moenius Agrippa. Fortunately we are able with very little difficulty to decide his identity. On a slab found near Camerino in Central Italy, we are told that he was tribune of the 1st Cavalry Cohort of Spaniards, prefect of an ala of Gauls, also of Pannonians, that he was prefect of the British fleet, and that he was specially selected by the Divine Hadrian and sent on the Britannic Expedition.† That both the Italian slab and the Maryport altars refer to the same person there would seem to be no doubt whatever.

The statement regarding his being tribune of the first cohort of the Spaniards is fully corroborated by the Maryport altars, whilst his personal friendship with Hadrian is apparently testified to by the fact that two of the altars, and possibly a third, are dedicated to "Jupiter and the Divine Influences of the Emperor." This,

* "The Maryport altars." *Trans. Cumb. and West. Antiq. and Arch. Assoc.*, vol. I, p. 187.

† Roman Wall. Dr. Bruce. 3rd Edition, 1867, p. 13.

then, gives us an approximate date for the presence of *some* of the Spaniards at least, for Hadrian reigned A.D. 117—138.

How long these Spaniards remained in residence we cannot say with any degree of accuracy; but following down the history of the cohort, it will be interesting to notice that in the reign of Antoninus Pius (A.D. 138—161) they were at Ardoch, in Scotland. The next intimation we have of them is at Netherby, in the time of Severus Alexander (A.D. 221—235). In addition we learn that an altar was “found in North Britain dedicated ‘*Genio alæ i Hispanorum*’—to the genius of the first wing of the Spaniards.”* There is here no clue to the date, but it is at any rate a further proof of frequent change.

The next we hear of them is that they were at Axelodunum, in Notitia times. Of course it has been argued that the rule was for cohorts to stay “for centuries” in the same camp. Clearly this rule cannot help us in the case before us, as the Maryport camp shows indubitable evidence that it at least is an exception to the rule. It has also been remarked that many sepulchral monuments refer to the *heirs* of the deceased persons, and that this is a proof of continuity. Thus at Maryport we have one inscribed:—

D. M.
MORI REGIS
FILII HEREDES
EIVS SVBSTITVE
RVNT VIX A LXX.

This, however, proves little in reality, as there *was* a time when property was left for a *first* time—when the *first* heirs entered into possession; and this may have been a case in point. Yet again on another point it is doubtful evidence, even though it were allowed to be a proof of continuity, for we must first prove the age of the stone, and then that “Morus Rex” was a Spaniard. Both present apparent impossibilities. Besides, the sepulchral slab found at Ardoch in the same way points to continuity there,

* Celt, Roman, and Saxon, 3rd ed., p. 335.

if the argument be held to be good, for we have on it the following inscription :—

DIS MANIBVS
AMMONIVS DA
MIONIS C COH
I HISPANORVM
STIPENDIORVM
XXVII HEREDES
FC

where the *heirs* are stated to have erected the slab.

Another point might still be urged in favour of continuity of the Spanish Cohorts in the Maryport camp. Being the First Cohort, it might with a show of reason be argued that drafts merely were sent from the station to the other stations mentioned, the main body still remaining at the Maryport camp. But this idea is at once shown to be untenable. The altars found at Netherby state that the cohort in garrison was 1000 strong; not a mere draft, but the whole cohort. Whilst the Maryport altars show as clearly that the First Cohort of the Dalmatians were in camp probably about A.D. 140, or thereabouts, and hence the Spaniards must have gone as a whole. The presence of the Dalmatians is recorded by two altars and two slabs. The latter are dedicated "For the safety of Antoninus Pius" (A.D. 138—161), and thus help to fix a date which the two altars themselves are powerless to do.

Yet another cohort was in garrison, viz., the First Cohort of the Bætasians. No very satisfactory proof as to their date is to be had, but on each altar occur the letters C.R. (Civium Romanum), as though the Bætasians were proud they were Roman citizens. From this Dr. Bruce seems to infer that such letters favour a date at least as early as A.D. 211; in fact, he is evidently of opinion that the whole of the altars found at Maryport belong to the reigns of Hadrian and Antoninus Pius (A.D. 117—161). If it be held that the Bætasian altars are of a much later date than this, on account of the freshness which they present, this in itself would be an important argument against the return of the Spaniards, and hence against the name Axelodunum.

So far, then, we have been unable to trace any proof of continuity, at any rate up to the year A.D. 200. Whether *after* this date we shall be able to pick up any information leading to the fact of the return of the Spaniards, and their continued residence in the Maryport camp, it will now be our business to enquire.

It must be remembered that there are still several altars that have not as yet been brought under review in the foregoing remarks. Many of them are of course useless for the purposes of our investigation. Amongst these are the one by the "Cohort (?) from the province of Mauritania," and the Spanish one by Marcus Censorius Cornelianus—seeing that they cannot be connected with the "find" of 1870, nor can the date of their dedicators be discovered. We shall also have to omit the altar to Belatucadrus by Julius Civilis, and that to Setlocenia by Lucius Abareus Genialis (?), as we have no means of determining either to what cohort the dedicators belonged, nor yet the time at which they lived. For obvious reasons we shall also have to omit all broken altars—altars without inscriptions, etc. So that, including the altars already mentioned, there are only some fifteen altars by the Spaniards, five by the Bætasians, and three by the Dalmatians that are available for our purpose.

Granted that the conclusions to which we have already arrived at are correct, i.e. with regard to the relative dates of those by M. M. Agrippa, the Dalmatians, and the Bætasians, we have for our present purpose some ten Spanish altars left, viz :—Four by Caius Caballus Priscus; two by Helstrius Novellus; three by Lucius Cammius Maximus; and one by Lucius Antistius Verianus. With regard to the first six, their leading characteristics compare very strongly with those of M. M. Agrippa, so much so that we should probably not err greatly in assigning to them a date not far removed from that of Agrippa himself. The remaining four, although apparently of a later date, still belong clearly to an earlier date than those by the Bætasians, which appear to be the latest in point of time, as judged by their appearance in the "find" of 1870. Still inferences drawn in this manner may easily err, and it will be

well to seek corroborative evidence. Can we in any way determine the date of the ten altars already alluded to? Are they of the same or of a later date than those whose dates we have approximately fixed? To decide this, we shall have to consider as briefly as may be, *why*, *when*, and *by whom* the altars were buried. This is not an easy question to settle, but withal it is a very important one when a satisfactory decision is to be arrived at regarding the name. Two truths, which we might almost call axioms, seem to point out the way for us. They are as follows:—If it can be proved that they were all buried at an *early* date, then so far as altars are concerned, there could not be the slightest clue to the name Axelodunum, for, as I take it, the large majority of the altars found at Maryport, (including those found before 1870,) and certainly of the altars with intelligible inscriptions, were buried at one and the same time, and at one and in the same place. If, on the other hand it can be shown that they were buried at a *late* date, then the probability that the name is Axelodunum is strengthened, though by no means is there certainty even then.

The great question to be determined is—*why* were they buried? Dr. Bruce* supposes that the cohort in garrison withdrew in order that it might help in defending other stations that had been attacked, and that, before going, they buried their altars.

This seems a very plausible reason, and at almost any other station, would have been accepted without dissent. But it should be remembered that Maryport, by whatever name it was then known, was the key to both their eastern and southern communications. As I showed in “The Maryport Camp—Who was its Founder?”† that they should as a body willingly leave so important a position *entirely* at the mercy of the enemy, even to help in defending stations at a distance, seems scarcely the action of a military people like the Romans. Of course, such a proceeding would quite answer the question why the altars were buried, for the retiring cohort could scarcely take them with them “to the front.” Still, under certain circumstances, even this method may have been

* Cumb. and West. Antiq. and Arch. Soc. Journ., July 17, 1870, p. 175.

† Transactions, part ix., p. 67.

followed, but it is a plan that would necessitate a state of peace in this particular neighbourhood, for naturally a cohort would not be withdrawn from a threatened position, and especially one of such manifest importance. That this was not the case we shall shortly attempt to prove.

It has also been suggested that the altars were buried in a fit of religious zeal, and that the garrison, having embraced Christianity, buried what before had been dear to them. Unfortunately for this supposition, we are entirely without proof that the garrison ever did embrace the Christian religion.

The most likely supposition that appears to me is that a *part* of the garrison might be withdrawn under conditions already stated, and that "the enemy" taking courage because of the weakened state of the garrison, made a determined attack on the camp, and was successful in driving the defenders out of their position. Seeing defeat inevitable, we may suppose that they would take precautions to hide their altars, or, at any rate, so many of them as they had time to conceal, in the hopes that, on their return with their comrades in arms, they would once again restore the altars to their original positions.

Of course, there may have been no withdrawal of *part* of the forces, as the whole cohort may have been driven out by the enemy, but this is not very probable, considering the natural strength of the position and the strength of the garrison, for the 1st Cohort was a double one consisting probably of nine hundred and sixty men.

Two points observed during excavations made in 1870 apparently favour the supposition that there had been a disaster before the altars were buried. In the first place, the altars had been placed in the pits *with care*, i.e.—some design seems to have been followed in their burial, for in *no* case was an inscription placed uppermost. And again, they seem to have been gathered together from the surrounding temples and buried in the smallest possible compass. Had they merely wished to get rid of them, as though they had finished with them or that they were leaving the station for good, much the easier plan would have been to place them in the ground where

they had originally stood. Such conduct may be fairly assumed to infer that the intention was to disinter them. Why they were not so disinterred we shall enquire shortly.

Another point observed was that the altars had been buried *with haste*, a fact which *might* point to a diminished garrison. That they were so buried is very evident, for several of them had had pieces broken off whilst they were being put into the pits, this being proved by the fact that the broken pieces were found in the pits beside the altars.

Now it is true that such hasty burial might have been only the result of carelessness on the part of the persons engaged in the operations, and that after all the cohort departed peaceably after completing the burial. But even this does not seem compatible with the facts elicited not only during the excavations made in 1870, but also during those made in 1880.

Several mutilated altars, sculptures, &c., were (in 1880,) found lying scattered up and down the Camp, one even being rolled over the face of the cliff to the seaward side of the Camp. Of course it may be said that *these* altars, &c., may have represented a different period than that represented by the altars found in 1870. But, be this as it may, at least part of *one* altar represented in the "find of 1870," viz., one by the Spaniards under C. C. Priscus, was found in 1880 some 350 yards from the site where those of 1870 were found, and in close proximity to the mutilated remains found in 1870. It is difficult to see why this should not have been interred with the others, if the cohort had left peaceably. It is broken, and others are in the same condition; surely only an enemy could be answerable for *this* state of things. Had the cohort left peaceably, it would doubtless have followed the usual custom and have taken its altars along with it. Clearly, in the face of a triumphant enemy, this would have been an impossibility. Has this any bearing on the case in point? Yet again, *Lyson's Cumberland*, p. cxlii., and *Wright, Celt, Roman, and Saxon*, p. 452, point out that the town showed signs of having been "burnt down and then rebuilt." This clearly testifies to troublous times at some period previous to A.D. 417. Such *burning* may of course have been the result of accident,

but taking all things into consideration, it seems more probable that after driving out the cohort, or such part of it as remained, the enemy set fire to the town, and at the same time mutilated all the altars, &c., that it had been found impossible to hide.

If it then be granted that the altars have been buried as the result of an impending disaster, what was the approximate date of this disaster? Was it at an *early* or a *late* period of the Roman occupation? From A.D. 180 to A.D. 210 seems to have been a time of unwonted activity on the part of the tribes in the immediate vicinity of "the Wall," and the year A.D. 184 is marked out as a year when great disasters overtook the Roman arms in the north. Can this be somewhere about the date when the altars were buried? when the "ruthless Briton" wreaked his vengeance on such altars and sculptures as he could lay his hands upon? Much that has already been said favours an early, as opposed to a late burial, and Dr. Bruce* favours this view. The coins found also testify apparently to a break in continuity. If buried *early*, then the probability is that the Bætasians buried them, if *late*, then the Spaniards *may* have performed this action, for the ten Spanish altars previously mentioned *may* represent the later period. Many things, however, seem to point strongly against the probability of a *late* date. In A.D. 417, the Spaniards, or whoever chanced to be in garrison, apparently withdrew peaceably, knowing that they were not coming back again, and hence need have taken no precautions to bury the altars in the way that they were buried.

Besides, if buried by the Spaniards, they seem to have been specially solicitous about the Bætasian and Dalmatian altars, whilst leaving some of their own to be destroyed. This seems contrary to what we should have expected. It seems more likely that whoever buried them would bury their own *first*, and afterwards those of the other three cohorts. Had they been buried at *different* times the burial of the second or third lot would have revealed the others. Strangely enough, the evidence is very pointedly in favour of the fact that the Bætasian altars were buried, not only before those of the Dalmatians, but also before those of the

* Lapidarium Septentrionale, p. 429.

Spaniards, and that the oldest altars were buried nearest the surface. Thus, we might fancy, with some degree of certainty, that the altars were buried by the Bætasians.

The date of Marcus Mœnius Agrippa being known, why did the Spaniards of that date not take their altars away with them, or bury them? They were apparently followed in the camp by the Dalmatians, and these in turn left their altars behind. Why was this? Why did they not take them away with them, or bury them before they went? The Spaniards apparently went to the front, on active service; for we find them after this north of the Antonine Wall. Clearly they could not go on active service encumbered with so many altars as it is clear they left behind them at the Maryport camp. They therefore may have given them into charge of their successors, viz., the Dalmatians, and these in turn to the Bætasians: and each apparently with the idea that they would return at an early date to the camp.

The Dalmatians once and for all disappear from the page of British history, unless, indeed, we again meet with them under the name "Dalmatian Horse," located, according to the Notitia, at Branodunum and at Presidium.

That the Spaniards did not return—at any rate, for one hundred years—we have almost conclusive evidence. Clearly the Spaniards in garrison between 117—138 could not have buried the altars, as in two pits at least, a Bætasian altar was buried *under* the Spanish altars, whilst in another case a Bætasian altar was buried under a Dalmatian one. If, however, it be held that they have been buried by Spaniards, these must of necessity have been the returned cohort. But the evident intention to disinter the altars, points to the fact of their leaving the station again, and, as I have already shown, after a disaster. Thus a second return would be necessary in order to point to any continuous residence even during the later times. But such a return was not likely under the circumstances. Surely they had a regimental tradition that their "holy things" had been hidden. Then, why were they not disinterred? for we cannot suppose that their absence was of very long duration. The im-

portance of the position was too great to allow of its being retained in the hands of the enemy for any great length of time.

Is it not an indirect proof that they did not come back again? Clearly, however, such a method of argument involves more of uncertainty than is admissible.

It would thence appear most likely that the Bætasians, before being expelled, first buried their own altars, then those of the Dalmatians, and lastly those of the Spaniards; and this would be quite in keeping with a supposed promise to their predecessors to take care of what they looked upon as sacred.

That they did leave the camp is certain; for in the Notitia we find that the first cohort of the Vetasians (Bætasians?) was stationed at Regulbium (Reculver, in Kent).

Another argument pointing to the fact of the early burial of the altars, and this by the Bætasians, may very probably be found in the consideration of the general appearance of the altars as shown at the present day. Those found in 1870 are for the most part in a surprisingly good state of preservation, the lettering being—especially in the Bætasian altars—remarkably clear and distinct. It is true they are chipped, etc.; but, as has been already shown, this was the result of accident—not of the weather, nor yet of design.

It is also true that those found previous to 1870 are in a much worse state; but this is to be accounted for—not that they were in a worse state when interred, but that they have deteriorated since they were dug up. A very cursory examination of the whole of the altars in the portico at Netherhall would show that they can be easily divided into three classes; and the distinction is so marked that, unaided by any other help than their appearance, the merest tyro in antiquarian lore would almost unerringly divide them correctly, each under its separate head.

Though there appears to be no record of the actual dates, etc., at which the altars were found previous to 1870, still an approximate date may be fixed. Thus Camden in 1599 notifies the existence of four altars and a slab. Three of these are in the portico, and they are certainly wrecks of their former selves.

Horsley in 1732 mentions six others; and to these Hutchinson in 1794 adds four more. These are in a much better state of preservation than the previous ones; but, so far as the scrolls and inscriptions are concerned, they are much more weathered than those found in 1870.

Assuming then that all the altars—with possibly one or two exceptions—were buried at the same time, and that the same rate of deterioration took place in those far off times as now, it is clear that they could not have been above ground a very great length of time. Hence, assuming that the Bætasians were in garrison in early times, we may fairly allow that the altars were buried, if not about A.D. 184, at any rate before A.D. 240. A date later than this is not probable, owing to the regular succession of coins from that date onwards to the close of the Roman occupation.

If then it be granted that the cohorts were not stationary, but were, on the contrary—at any rate during the earlier part of the occupation—frequently changing; also that the altars are all of an early date; where is the altar or slab that proves Maryport to have been the Axelodunum of the Notitia? And, if there are none, why should this name be given as “beyond doubt?” If the Notitia was—as we know it was—an army list, surely it would not state a fact which was true only some two hundred and fifty years before. Clearly it states that the Spaniards were at Axelodunum about the year A.D. 400, the altars apparently as clearly prove that they were at Maryport before A.D. 138, and that they afterwards left the place. To prove that the station is Axelodunum, we must prove not only that they returned, but that they continued in residence till within “measurable distance” of A.D. 400. Can this be satisfactorily shown? I think not. Still we may argue that our chain of evidence is not complete—that it has a thread of weakness running through it. At any rate, whether this be so or not, we will now endeavour to strengthen it by additional evidence from another quarter.

To my mind a great flood of light is thrown on the question by a consideration of the various lists of names of towns that have come down to us. First we will take the Notitia. In the list of twenty-three stations “per lineam valli” we have the following, viz.:

- | | |
|------------------------|------------------------|
| 10. <i>Æsica.</i> | 14. <i>Aballaba.</i> |
| 11. <i>Magna.</i> | 15. <i>Congavata.</i> |
| 12. <i>Amboglanna.</i> | 16. <i>Axelodunum.</i> |
| 13. <i>Petriana.</i> | |

Where we find that *Axelodunum* is in close attendance upon *Amboglanna* and *Aballaba*.

We have a second list in what is known as the "Cosmography of a writer of Ravenna," in which the following list appears in direct sequence.

Æsica.
Banna.
Uxeludiano (Axelodunum).
Avalaria (Aballaba).
Maia (Magna?)

Here *Axelodunum* is again in company with *Aballaba*, together with a fresh name *Banna*. Granted that the testimony of altars is to be relied on, *Banna* should be but a shortened form of *Amboglanna*, for at the latter place an altar was found dedicated:—

DEO SANCTO
 SILVANO VE
 NATORES
 BANNA SE.

} To the Holy God *Silvanus*,
 the Hunters of *Banna*
 have dedicated this.

But again, the credibility of altars as a sole means of allocation receives a rude shock, for another list has yet to be brought in evidence, and this list it will be found includes *both* names. Hence they must refer to different places. In 1725 a small elaborately chased bronze cup was found in a well at a village called *Rudge*, in *Wiltshire*, and hence called the *Rudge Cup*. Round the rim was an inscription consisting of the following names:—

Mais.
Aballaba.
Uxelodum.
Amboglans (Camboglans?)
Banna.

No. 370 *Lapidarium Septentrionale.*

No. 416 *Lapidarium Septentrionale.*

Here Banna is in company with Amboglanna, and thus strengthens the Ravenna list, when it places Axelodunum in near proximity to Aballaba and Amboglanna. I am well aware that all these lists are not exactly in the same order, but a satisfactory reason seems clear, though, for the purposes of this paper, it is not necessary that we should enter into the details. It is sufficient that we have here three independent lists all pointing to the fact that Axelodunum is in the neighbourhood of Amboglanna.

Granted that the first twelve stations on the Wall are in direct sequence from east to west, there seems no satisfactory reason why, in a military list at any rate, the remaining stations should not follow according to the same order. Hence, taking the Notitia list, and allowing on an average of four miles between each station, Axelodunum could not be more than fifteen or sixteen miles west of Amboglanna, i.e., Birdoswald. That a greater distance intervened is not likely when the intention of the Rudge Cup—a libation cup (?)—is concerned. Hence Axelodunum would appear to be in its proper place in direct sequence west of and not far from Amboglanna, and thus Maryport could not be Axelodunum.

Further light on this question will be shown when we come to discuss the next name, for arguments in favour of *one* name naturally are against another. Granted now that we must give up the name Axelodunum, we have still three names left, all of which as I have said are Notitia names. These names, still in alphabetical order, are Glanoventa, Olenacum, Virosidum. We cannot pursue the same line of argument with regard to these names that we did with regard to Axelodunum, and perhaps fortunately so, for in this case I am afraid that your patience would be sorely tried long ere I had finished my argument.

Fortunately for you, but not for the cause which I have in hand, no remains of any kind, so far as we know, have been found that would tend to identify any of the places that have been called by these names. We shall therefore have to strike out a new and independent line, where, *not* altars, but *roads* must be our means of communication, and this seems at any rate a more rational method! As a preliminary to this method, we must ask if there is

any apparent plan on which the *Notitia* lists are compiled. The Ravenna list may be, and doubtless is misleading, though there is probably more design even in this list than a cursory glance would show. But, when we come to the *Notitia* list—the army list—surely here, at any rate, we should find something tangible to work upon; for, to be of any use at all, it must be at least straightforward, if not in actual sequence of names, at any rate in intention. An examination of the various names will probably show us that it is to the second of these heads that we must look for success in our search.

It has been, I am afraid, too much the fashion to look upon the defences of the Roman Wall as consisting merely of twenty-three stations, of which it is allowed, with tolerable unanimity, that eighteen are directly “on the wall,” the other five being elsewhere; such ranging, as I have already shown, between Warwick and the immediate vicinity of the Wall itself.

But the question naturally arises, does the list in the *Notitia* convey the idea that there *should* be any sequence of places? As we have seen, the first twelve stations on the wall are probably in direct sequence, but this is scarcely sufficient for our purpose, as we want not probability, but certainty, if possible. To secure this, we shall have to examine the *Notitia* list from a much wider standpoint than is shown by that part of it contained in the twenty-three stations “per lineam valli.” After all, these twenty-three stations give us but an inadequate idea of the Wall itself as a military work. They present to us not a purely defensive work, but merely an isolated barrier, without connections, without subsidiary works. To make the list a perfect one in a military point of view, we want the various methods by which communications were to be kept up with the head-quarters, which, we know, at any rate in later times, were at Eburacum (York). Referring then to our list again, we find immediately preceding the twenty-three stations, the following very instructive list of stations, in which the original of we have not only the name of the station itself, but its *Notitia* garrison. Omitting the name of the garrison, I have included the supposed modern representative of the station.

- | | |
|--------------------------------|------------------------------|
| 1 Presidium (Brugh) | 8 Verteræ (Brough) |
| 2 Danum (Doncaster) | 9 Braboniacum (Kirkby Thore) |
| 3 Morbium (Templeborough) | 10 Maglova (Barnard Castle?) |
| 4 Arbeia (Adel?) | 11 Magæ (Piercebridge?) |
| 5 Dictis (Brugh, near Askrigg) | 12 Longovicum (Lanchester) |
| 6 Concangium (Greta Bridge) | 13 Derventio (Ebchester) |
| 7 Lavatre (Bowes) | |

We shall briefly discuss whether we have here direct sequence or not. The headquarters, as we have already stated, were situated at Eburacum (York), and the military road ran thence northwards by Isurium (Aldbrough) and Cataractonium (Catterick), and so across Stainmore to Luguvalium (Carlisle).

The earlier portion of this road lay open to attacks from the Brigantes, whose strongholds were in the mountainous parts of the county, whence they were able easily to make descents on the road, &c.

To afford protection to it, camps were planted in these lateral valleys, and doubtless the allocation above represented, based on the views of Mr. W. H. D. Longstaffe,* will be found to be tolerably correct. At any rate, a road passed *via* Adel, Ilkley, and Brugh, meeting with the main road about half-way between Greta Bridge and Bowes. Stations at Lavatre and Verteræ undoubtedly held the pass over Stainmore. Beyond the latter station we have Braboniacum, which *may* have been Kirkby Thore, (the Brovonacis of the 2nd Antonine Iter.) Arrived here, we seem brought to a stand still in the immediate neighbourhood of the western termination of the Wall, for all the stations in advance are known, and to none of them can be applied the names Maglova, Magæ, Longovicum, or Derventio. Where shall we then look for these? Has the name Concangium anything to do in unravelling the mystery? I think so.

Thus a detachment from *Dictis* arriving on the second Iter would find the names Concangium and Lavatre on their list. Of course they knew that their route westward must lead them through

* Archæologia Æliana, vol. 8, part 24, page 287.

Lavatre and not Concangium. But reversing the order, their route would pass eastwards through Concangium, and hence not southward again, but northward to the Wall.

Thus the stations that are put after Braboniacum must be looked for after Concangium, and in connection with the east end of the Wall. Maglova and Magæ may well be supposed to guard the valley of the Tees, the possession of which was an absolute necessity as an adjunct to the road over Stainmore. Then at Longovicum (Lanchester), we are in direct communication with the east end of the Wall at South Shields, *via* Epiacum (Chester-le-Street), and by another arm to the central portion of the Wall *via* Derventio (Ebchester-on-Derwent).

At *Braboniacum*, at least three arms run to the Wall:— (1) Via the Maiden Way, reaching the central portion of the Wall at Magna (Carvoran). (2) Via the second Iter to Luguvalium (Carlisle). (3) Via Whitbarrow to Old Carlisle and Keswick.

Granted then that we have shewn a perfect sequence of places, so far as the thirteen stations just named are concerned, it seems but natural that the same plan should be followed with regard to the remaining stations “*per lineam valli.*”

Before we can fairly discuss the next part of the question, we shall have to decide (1) that only eighteen are on the Wall, and (2) which five are not actually *on* the Wall. Antiquarians are tolerably in accord in placing eighteen as the number; and it seems only reasonable that *Tunnocelum*, the eighteenth station, should be on the sea coast, seeing that its garrison, according to the Notitia, was the 1st Cohort of the *Ælia Classica*, i.e., a Cohort of Marines.

Following then the order as given, this station must have been on the west coast, and hence at either Bowness or Skinburness.

The Rev. W. Lytteil, writing to me on this point, says:—“I regard *Tunnocelum* as derived from the Gaelic (or Celtic) *dun a' chaoil*, signifying ‘the fort of the firth—the fortress of the strait.’ This is to be preferred to *dun na caoile*, meaning the ‘fort of the narrows,’ literally ‘the fort of the narrowness, or waist.’ The somewhat narrow mouth of the Gareloch (about opposite to Greenock) is

called 'The Narrows.' The 'Kyles' of Bute are the 'straits' or 'narrow seas' of Bute. Of course," he adds, "we can say '*camp* of the strait,' for these words are equivalent to 'the fort of the firth.'"

By adopting this derivation, the difficulty vanishes. How very aptly it suits the position of the Bowness camp, the map of Cumberland bears abundant testimony. If this be granted, then the five stations we have yet to discuss must be the five last on the list.

The question hence arises, shall we find these five stations in connection with the eastern or the western branches of the great road running northward from head quarters? or shall we find them stretched across from west to east, to serve as rallying or supporting stations? It would be easy to find five stations that would admirably serve as supporting stations, but such a method has too much of mere guess work about it to be of any value. To my mind, the whole matter is inseparably mixed up with the building of the Wall.

One theory ascribes the foundation of the Wall to Stilicho, about A.D. 400; another to Hadrian, A.D. 117—138.

Should Stilicho have been the builder of the Wall, no great stretch of imagination would be required to show the probability that all the five might be on the *east* coast; for we know that about his time the Roman fleet was much occupied in keeping the daring sea-rovers back. As an auxiliary to this fleet, a strong line of forts might be necessary along the coast; but, so far as we know, the only evidence of such forts is at the mouth of the Tyne. That this would be the *only* place so defended seems scarcely credible, i.e., supposing five to be necessary on the east. But if we turn to the west, even at the same period, we shall find a more pressing want of camps than on the east. The Picts and Scots were a more formidable enemy to the Romans, than were the Saxons. Against the latter, their fleet could act with success; but the matter was different on the Solway.

It is however generally allowed that Hadrian's was the master-mind that planned and carried out the mighty Wall whose remains to this day excite the wonder and admiration of the beholder. Did he fail to grasp the elementary truth that, unsupported, all his magnificent work was of but little practical worth? That he did take in the whole situation, is, I think, very clear. Hence his plan must have included a series of camps intended to prevent the outflanking of the Wall; and thus it is most probable that all the five stations were on the west, and in direct communication with the line *via* Whitbarrow, which *may* be *Virosidum*.

To carry forward such an undertaking, Hadrian would require an immense quantity of provisions, not to mention numerous other wants; and this would necessitate a regular service of convoys from head-quarters to the front. Now, under certain circumstances, he could not but perceive that a route by way of the Tebay Valley might be a hazardous one for convoys at least; still, all the same, his commissariat must of necessity be replenished at regular intervals. Hence he must have a port in connection with the western end of the Wall, which should, if need be, relieve him of all anxiety on this score. Even if Agricola had not originally chosen Maryport as his port, as I attempted to show in *Transactions*, Part IX., p. 67, it is certain that there was a port at the time of Hadrian, as is proved by the presence of altars by Marcus Mœnius Agrippa. But why should he have been chosen in preference to a less important officer? If our surmise be correct, it will readily be allowed that the position was one, the importance of which cannot be easily over-estimated. This officer, according to the Camerino altar already mentioned, was specially selected to command the British fleet; and at the same time, amongst other commands, he was tribune of the 1st Equestrian Cohort of the Spaniards.

The intention of the fleet is obvious, whilst the cavalry must have been necessary to keep open a line of communication with Deva (Chester), at any rate through the Cumberland section of the road, as also to overawe the natives in these parts. Such a

road, then, was a necessity ; and that it was a purely military road, in the highest sense of the term, we may feel sure, from its manifest importance. Besides, would so important an officer have been put in connection with the base by a mere *vicinal* road? or would he be put merely to superintend the despatch of provisions, etc., to the front, as they arrived by sea? Such work is not done now-a-days by Agrippa's successors in command of the British fleet. That there was such a road, via Keswick, etc., is beyond dispute; whilst its connection with Deva speaks to its comparatively early date. Could such a road be any other than a military road, and therefore an *Iter*? If so, there is only one that is at present undecided, and this is the tenth.

Under circumstances already detailed, I propose then to bring this *Iter* to Maryport, which would thus be *Glanoventa*. That the tenth *Iter* runs northward through our present Lancashire, seems pretty generally allowed; and it seems certain that its intention was to communicate with the Wall. Whether this communication was directly made by way of Borrow Bridge and the Maiden Way, or indirectly by way of Maryport, may be an open question. The difficulties of the former route have been shown in connection with the transport service; whilst the manifest advantages of the latter route have also been shown. Besides, the Maryport camp was connected with the Wall by a grand military road twenty-one feet wide.* Surely this is not without some signification. That the *Iter* ran through Cumberland, receives some confirmation from the fact that many eminent authorities agree that Keswick is the *Galava* of that Itinerary; whilst Mr. R. S. Ferguson says† that Old Carlisle is undoubtedly *Glanoventa*. This allocation he has apparently withdrawn,‡ so that we are still undecided. The whole of the Itineraries (leaving out the tenth) seem to have been compiled with the special intention of having a seaport at one end or the other, or both. Granted then that Keswick is the *Galava* of the Itinerary, the inference points irresistibly to the fact, that in allocating *Glanoventa* at the Maryport

* See Trans. Cumb. & West. Antiq. & Arch. Soc., vol. 5, p. 240.

† Ibid, part i., vol. 3, p. 88. ‡ Ibid, vol. 7, p. 80.

camp, we satisfy every requirement. In every respect, as we have shown, it would be a most fitting termination to an Iter, whilst its distance from Keswick almost exactly suits the distance named in the Itinerary. More than this: it is an allocation that does not violate the conclusions to which we have already arrived; for, referring again to our Notitia list—it is in direct sequence after Tunnocelum, which we have supposed to be Bowness:—

17 Gabrosentis	21 Bremetenracum
18 Tunnocelum	22 Olenacum
19 Glannibanta	23 Virosidum
20 Alionis	

True, there are evidences of other camps between the two places, but there seems to be no more reason that these camps should have Notitia names, than that several camps in close proximity to the Wall between Cilurnum and Amboglanna should have had.

Even etymology is favourable to us; for, on the authority of Dr. Hooppell,* it is *Glan-y-bant*, i.e., “the brink of the height;” a most appropriate name for the station. In point of fact, Dr. Hooppell says, in a letter to myself—and I have his permission to use it—“I certainly think, if Glanoventa was not at the mouth of the Tyne, the only other place known to me that could put in a claim for it is Maryport.” Whilst speaking on the Etymological side of the question—the Rev. W. Lytteil has favoured me with the following:—“Glanoventa is clearly the Celtic *cladh na bhfianta*, signifying ‘the heroes’ camp’—the fort, vallum, or rampart of the heroes. This is pronounced as *clahmaveinta*, for the *bhfi* is equivalent to the English letter *V*.”

Such derivation carries us still farther back than the Roman times; for it is clear that the heroes could not be Romans. Probably the Mote Hill was then part of the belongings of the heroes, whilst at least two undoubted “cup and ring” marked stones have been found.

But it may be asked, Where are the remains proving it to be Glanoventa? for the Notitia says that it was garrisoned by the 1st Cohort of the Morini. As I have already attempted to show,

*Archæologia Eliana, vol. 8, part 23, p. 50.

there seems to be no absolute necessity that there should be any remains in the shape of altars, etc. Indeed, if the Morini were stationed at the Maryport camp in Notitia times, there is not much probability that such testimony exists.

Of one stone found at Maryport I should like to have offered a few remarks, viz., the one No. 880 Lapidarium Septentrionale; but I must content myself with saying that the inscription there given is not strictly correct, the second line being, in reality, QVINANAH, and not QVI NANAT; nor does this appear to be the only error in the reading: in which case the rendering will not be accepted as final.

Whilst thus holding to the name *Glanoventa*, it appears to me that *roads* are *before* altars in the determination of places; and I feel certain that if the search had been conducted on these lines, rather than on those of mere theory, there would have been more certainty in the allocation of places.

In conclusion, I think it only right to publicly own the deep obligations under which I am placed to Mrs. Senhouse. Without her very kind help in the matter of books, I could never have hoped to do a tithe that has been done. The quality of what I have written does not detract from that kindness.

ZOOLOGICAL RECORD FOR CUMBERLAND, 1886

BY THE

REV. H. A. MACPHERSON, M.A., AND W. DUCKWORTH.

AVES.

I.—BREEDING BIRDS.

(1.) *Cinclus aquaticus*. Dipper.

In 1886, a pair of Dippers built their nest on one of the lower boughs of a willow tree, overhanging the river Eden, at an elevation of ten or twelve feet. An unpractised eye would certainly have mistaken the bulky nest for an accumulation of wreckage, deposited by the stream in flood.

In 1885, a pair of Dippers nested in this identical willow, but the nest was then placed upon a different bough from that selected in 1886.

In 1885, another pair of Dippers selected a similar site for their nest on one of the lower boughs of an oak tree.

All three nests were found *in situ* by Mr. W. Duckworth.

Such a strange divergence from the usual habits of the Dipper is difficult to account for.

NOTE.—Mr. Shepherd of Carlisle states, that on a recent occasion he observed a Dipper capture a small fish in the Caldew. The Dipper emerged from the stream, and on reaching shallow water released the captive, which made at once for deep water. After allowing the fish a start, the Dipper darted after it and recaptured it, subsequently releasing and recapturing it alternately, until tired of play; the fish was then bruised by repeated pecks, and swallowed head foremost.

(2.) *Dendrocopus major*. Greater Spotted Woodpecker.

Several pairs of Greater Spotted Woodpeckers nested in the North of the county in 1886. Mr. Duckworth and Mr. Cairns visited a favourite haunt of this species in April, and had the pleasure of examining a nest excavated out of a wild cherry tree, at a height of ten feet from the ground. The orifice measured $13\frac{1}{4}$ inches in diameter, and had been prepared with care, the rough edges having been bevelled off as neatly as if the operation had been effected by means of a rasp.

A Greater Spotted Woodpecker was shot (by misadventure) in the same locality on June 24th, and proved to be a feathered nestling.

(3.) *Spatula clupeata*. Shoveller.

Mr. Duckworth observed several pairs of Shovellers on the preserved water at Monkhill, in April.

On the 8th of May, Mr. Smith of Drumburgh was fortunate enough to discover a Shovellers nest, placed in a tussock of grass on one of the Solway salt marshes. It contained nine eggs, seven of which were hatched by a fowl, the first chick emerging from the shell on May 26th, in the presence of Mr. Duckworth. The young birds unluckily proved to be delicate, and only one lived long enough to become feathered.

Mr. Macpherson submitted two of the "downs" to Mr. Bidwell, who has long made a special study of "downs." Mr. Henry Seebohm obligingly examined a portion of the nest down, and decided that it was that of the Shoveller.

Mr. Smith had reported the Shoveller as present in his district in summer in previous years.

An adult male Shoveller, in eclipse dress, was shot near Drumburgh in the middle of October, and added to Mr. Macpherson's series of Anatidæ.

Further particulars of the distribution of the Shoveller during the breeding season, together with a description of the young in down, will be found in *The Naturalist*, 1886, pp. 235-6.

(4.) *Columba livia*. Rockdove.

In April, Mr. H. Nott observed a single Rockdove fly off a ledge at Sandwith, on which three pairs of Rockdoves nested in 1884.

(5.) *Coturnix communis*. Quail.

Mr. R. Mann heard a male calling vociferously near Allonby, on June 18th. It is possible that a pair bred in this locality in 1886, as in some previous years.

(6.) *Scolopax rusticola*.

Woodcock bred plentifully in the north and south-west of the county (cf. Postlethwaite, *Zool.* 1886, p. 300) in the spring of 1886.

The first Woodcock's nest reported was found on April 1st, by Mr. Plenderleath, and contained four eggs, upon which an old bird was brooding.

Mr. Duckworth examined five nests on April 23rd, one being placed in Cross-leaved Heath (*Erica tetralix*), and a second among dead oak leaves, under cover of a Rhododendron. A third was placed in Ling (*Calluna vulgaris*), and a fourth was partly hidden by some brambles.

Of five nests examined near Longtown on April 23rd, four proved to contain eggs advanced in incubation. The fifth nest contained five eggs; but of these, three were "dwarfs;" the others were just chipping the shell.

In 1885, a Woodcock's nest, containing a clutch of five eggs, was found near Thurstonfield.

The adult Woodcocks, observed, brooded over their nests with singular temerity, continuing in some instances to remain on the nests until actually touched.

The first young Woodcock were seen on the wing upon the 14th of May.

NOTE.—A record of Woodcock breeding in Northumberland appeared in *The Field* of May 29th, 1886, and was erroneously referred to the Carlisle district (R. F. Mathews. *Ib.*).

SUMMARY.

The year 1886 opened with severe frost, which lasted, with some interruptions, for many weeks, and resulted in a late nesting season.

The inclemency of the weather on high grounds induced many species of small birds to seek for food in the neighbourhood of the coast. Hence Chaffinches, Greenfinches, House Sparrows, Yellowhammers, and Common Buntings frequented the farmsteads near the Solway in unprecedented numbers.

The Curlew appeared on its breeding grounds near Alston on March 26th; and the first clutch of eggs was found on a low moss near Allonby exactly a month later.

The month of May will long be remembered for the enormous mortality of HIRUNDINIDÆ, coinciding with a sudden resumption of severe weather and east winds about May 12th. On that day, at Alston, "Snow fell during the entire day, and some drifts were six feet deep. In the field beside our house, there were Starlings, Whinchats, Wheatears, Meadow Pipits, Skylarks, Common Buntings, Sparrows, and Wagtails, all fraternising together. A great many nests were destroyed. Scores of Grouse nests were lost. After the snow thawed, some Grouse returned to their nests; of these, some brooded for a long time, but to no purpose, while others hatched out a portion of their sittings." (J. Walton in litt.)

As regards the Hirundinidæ, their decimation is reported on all hands, and numbers of dead birds, all perfectly empty, came under the notice of Mr. W. Duckworth.

"In one case, remarks Mr. Tremble, "twenty Swallows were found dead on the window ledge of a small clay cottage; in another, the exhausted birds invaded a smithy in search of warmth and food."

Subsequent to this disaster, the nesting season was favourable, and the Stockdove and Spotted Flycatcher bred in greater profusion than in any previous year.

The *one* satisfactory result of the summer of 1886 is identical with the discovery of the nest and eggs of the Shoveller.

NOTE.—The Raven (*Corvus corax*) would appear to have deserted Sandwith as a nesting station since 1884, but odd birds occasionally visit the old haunt of the species. A solitary Raven was observed by Mr. Nott, in the neighbourhood of the lighthouse, on October 15th, 1886. An interesting reference to two white Ravens, taken from one nest, in Cumberland, about the year 1548, exists in the *De rariorum animalium et avium stirpibus* of Dr. Caius, the court physician,

AVES.

II.—MIGRATION OF BIRDS.

Turdidæ. Turdus viscivorus. Missel Thrush. Spring. At Sandwich, April 7th, a great number arrived on the cliffs in the neighbourhood of the lighthouse, and remained two days. Mr. H. Nott shot a specimen for identification.

Turdus iliacus. Redwing.* Autumn. Carlisle, September 28th, one felled by telegraph wires. Allonby, October 2nd, one seen. Allonby, October 7th, evening, a number passed over.

Turdus pilaris. Fieldfare. Spring. Allonby, April 16th, one seen. Autumn. Carlisle, October 8th. Allonby, October 22nd, some flocks appeared.

Turdus torquatus. Ring Ouzel. Spring. Alston, April 5th, arrived on breeding grounds.

Saxicola œnanthe. Wheatear. Spring. Alston, March 29th, a pair. Solway, March 31st, some. Carlisle, April 1st, some seen.

Pratincola rubetra. Whinchat. Spring. Alston, April 23rd, arrived on low grounds.

Ruticilla titys. Black Redstart. Autumn. Carlisle, November 12th, a male observed by Mr. T. Duckworth and others, at Holme Head. This bird haunted a manure heap for two days, after which it disappeared.

Sylvia cinerea. Whitethroat. Spring. Carlisle, April 25th. Allonby, April 25th.

Sylvia atricapilla. Blackcap. Spring. Alston, April 15th. Carlisle, May 7th.

Phylloscopus rufus. Chiffchaff. Spring. Ravenglass, March 24th, observed by Mr. F. Reynolds.

* A yellow or cream-coloured variety of the Redwing was observed near Allonby on November 11th, 1886, by Mr. R. Mann.

Phylloscopus trochilus. Willow-Warbler. Spring. Allonby, April 6th. Carlisle and Ravenglass, April 14th.

Phylloscopus sibilatrix. Wood-Warbler. Spring. Carlisle, May 7th.

Acrocephalus phragmitis. Sedge-Warbler. Spring. Carlisle, May 7th.

Locustella naevia. Grasshopper Warbler. Spring. Allonby, April 27th.

MOTACILLIDÆ. *Motacilla alba*. White Wagtail. Spring. Carlisle, May 2nd, a single bird seen by Mr. Duckworth.

NOTE.—There is reason to think that in the Carlisle district this species occasionally interbreeds with the Pied Wagtail.

Motacilla lugubris. Pied Wagtail. Spring. Alston, March 28th, arrived.

Motacilla lugubris. Grey Wagtail. Spring. March 27th, returned to breeding grounds. Autumn. Allonby, one seen December 27th. [Very few winter in Cumberland.]

Anthus pratensis. Meadow Pipit. Spring. Alston, March 29th, an influx. Autumn. Allonby, September 17th, a quantity arrived on the Solway.

Anthus trivialis. Tree Pipit. Spring. Carlisle, April 20th; first heard in song May 2nd.

LANIIDÆ. *Lanius excubitor*. Great Grey Shrike. Spring. Carlisle, March, one seen, which had impaled a Yellowhammer. Autumn. Cotehill, October (second week), a two-barred male shot by Mr. Little. Castle Sowerby, October, a Grey Shrike shot. [This bird has still to be submitted for examination.]

Lanius excubitor, var. *major*. Autumn. Skinburness, November 2nd, a female captured with bird-limed twigs, whilst striking at a decoy bird. In the possession of Mr. Mackenzie of Carlisle.

MUSICAPIDÆ. *Musicapa grisola*. Spotted Flycatcher. Spring. Scotby, April 22nd (an early date), reported by Mr. A. Sutton. Carlisle, May 2nd.

Musicapa atricapilla. Pied Flycatcher. Spring. Wreay Woods, near Carlisle, April 25th.

HIRUNDINIDÆ. *Hirundo rustica*. Swallow.* Spring. Carlisle, April 14th; Allonby, April 23rd; St. Bees, April 23rd; Millom, April 24th.

Chelidon urbica. Martin. Spring. Carlisle, April 20th; Millom, April 24th; Alston, April 24th.

Cotile riparia. Sand-Martin. Spring. Rockcliffe, March 23rd; Carlisle, March 24th; Alston, March 30th; St. Bees, April 24th.

FRINGILLIDÆ. *Chrysomitris spinus*. Siskin. Winter. Carlisle, December, numerous.

Fringilla montifringilla. Brambling. Spring. Allonby, April 16th, one seen. Autumn. Allonby, October 21st, ten seen; wind E. Allonby, October 22nd, fresh arrivals. Winter. Burgh, December 27th, one shot by Mr. Tremble. Alston, December 30th, one shot whilst feeding with Chaffinches, and the first that has come under the notice of Mr. Walton, though Mr. B. Greenwell obtained specimens in this district in former years.

Linota rufescens. Lesser Redpoll. Spring. Newby, February 16th, great droves appeared. Allonby, a flock of eighteen the last week in February.

Loxia curvirostra. Crossbill. Mealrigg, November, a bird in green plumage killed, out of a flock of ten or twelve, which frequented some fir trees.

Plectrophanes nivalis. Snow Bunting. Alston, September 26th, a single bird seen on the moor. Subsequently, very scarce in that district, as remarked by Mr. Joseph Walton.

* An immature fawn-coloured variety of the Swallow was shot at Longtown, on the 29th September, 1886.

ALAUDIDÆ. *Alauda arvensis*. Skylark. Autumn. Flimby, December 12th, great numbers passed. Mr. W. Hodgson, A.L.S., reports that he found a great stream of Larks passing over at daybreak, and that the movement continued in force until 10-30 a.m., after which it slackened. By noon the movement was over. All flew S.W., wind N.E.

CYPSELIDÆ. *Cypselus apus*. Swift. Spring. Carlisle, April 29th. Alston, May 14th, first seen.

PICIDÆ. *Dendrocopus major*. Greater Spotted Woodpecker. Edenhall, near Penrith, one killed during the autumn, as reported by Mr. W. Raine, who adds that it is the first he has seen in twenty-five years. An important immigration occurred last autumn on the east coast of Scotland and England, as intimated by Mr. Harvie Brown and Mr. A. C. Chapman.

CUCULIDÆ. *Cuculus canorus*. Cuckoo. Spring. Carlisle, April 25th; Millom, April 27th; Alston, April 29th.

FALCONIDÆ. *Falco peregrinus*. Peregrine Falcon. Autumn. Allonby, September 23rd, a Peregrine passed over Aiglegill, flying high. Allonby, September 26th, a Peregrine killed a Blackheaded Gull in the presence of Mr. Richard Mann. Allonby, December 28th, a Peregrine paid two visits to the farmstead at Aiglegill, apparently in search of dove-cote pigeons.

It is to be regretted that five Peregrines and two Buzzards (*Buteo vulgaris*,) were killed in Cumberland in 1886. Of these, the Buzzards, and two of the Peregrines, were killed on the Edenhall property. A third Peregrine was shot on the Raven-glass estuary. The fourth and fifth Peregrines were sent to Mr. Dawson.

Falco aesalon. Merlin. Winter. Allonby, December 24th, a Merlin chased a Skylark so closely, that the small bird sought refuge in a barn, where it was captured.

PELECANIDÆ. *Sula bassana*. Gannet. Spring. Martindale Fells, May 28th, an immature bird was captured on the ground. Autumn. Silloth, an adult was seen by Mr. Low.

In 1885, a Gannet was caught in a burn near Crossfell, September 16th, and taken to Mr. Joseph Walton,

ANATIDÆ. *Anser* (sp. *incerta*). Grey Goose. Spring. Allonby, March 20th, a flock of eighteen passed over, flying east; wind southerly, strong. "These are the first I have seen this spring," writes Mr. R. Mann.

Allonby, April 27th, a flock of one hundred and twenty Grey Geese passed over, flying north; weather fine, light N. breeze.

Summer. Allonby, July, eight Grey Geese seen.

Autumn. Allonby, October 5th, thirteen Geese passed; weather fine, wind E.

Allonby, October 15th, flock of between seventy and eighty Geese passed, going S.W.; weather stormy, wind S.E.

Allonby, October 16th, eleven Geese going S.W.; wind E., stormy.

Allonby, November 17th, eleven Geese, going nearly due north.

Allonby, November 30th, five Geese flew N.W.; weather fine, cold; wind N.W.

NOTE.—It is probable that some of the Grey Geese thus reported are Pinkfooted Geese. The Report for 1887 will contain some remarks on this species.

Anser segetum. Bean Goose. Winter. Allonby, January, one shot, weighed $7\frac{3}{4}$ lbs.; weather severe. Rockcliffe, May 3rd, "There are still about thirty Bean Geese on the marsh," says Mr. A. Smith, "but they are very wild."

[Autumn. November, some obtained on the Solway.]

Bernicla brenta. Brent Goose. English Solway, January and February, a few shot. All dark-breasted birds. Bowness, two shot March 13th, adults, male and female. Mr. Macpherson dissected the gander, and found its stomach extended with marsh grass, upon which it had been feeding voraciously, together with some fine sand.

Bernicla leucopsis. Barnacle Goose. Autumn, Rockcliffe, October 5th, first heard. Rockcliffe, October 11th, arrived in force.

NOTE.—A single Barnacle, full winged, passed the entire summer on the Solway, and was seen by Mr. Duckworth on May 20th and June 13th.

Mareca penelope. Wigeon. Spring. Allonby, February 11th, evening, two flocks of fifty and sixty birds seen by Mr. R. Mann, flying east, as though on a long flight. Mr. A. Smith writes under date April 8th: "There has been more Wigeon [and Teal] about Rockcliffe Marsh during the last three weeks, than there was at any time during the winter. I have no doubt that they have been detained by the cold weather and snow."

Carlisle, April 21st, some flights of Wigeon passed up the Eden, flying east; wind S.W. to N.E.

Rockcliffe, April 21st, as at Carlisle.

Rockcliffe, April 22nd—26th, some passed.

Rockcliffe, April 27th, a great rush of Wigeon in an easterly direction; the movement was at its height from 9 p.m. to 10-45 p.m., and the birds passed up both sides of the Eden, with intervals of about five minutes between the flocks, until 10-45; after 10-45, the birds continued to pass, but at much longer intervals.

Ravenglass, April 23rd, two Wigeon on estuary; last seen.

Monkhill Lough, April 26th; last seen.

Autumn. Monkhill, September 7th—13th, a large flight arrived.

Ravenglass, October 6th, two seen.

Allonby, October 7th, a flock of fifty Wigeon.

Dafila acuta. Pintail. Spring. Drumburgh, February 20th, one shot. Autumn. Glasson, October 23rd, one killed.

Chavlelasmus streperus. Gadwall. Spring. Silloth, March, two seen; female shot, sent to Mr. Macpherson. Autumn. Silloth, October 28th, a bird in first plumage shot out of a flock of Wigeon; sent to Mackenzie of Carlisle.

Fuligula ferina. Pochard. Spring. Silloth, February 26th, two shot, and sent to Mr. Macpherson. Autumn. Silloth, August 18th, some shot, as reported by Mr. Dawson. Alston, October, one adult male shot, as reported by Rev. H. H. Slater.

NOTE.—Mr. Macpherson examined a male shot near Alston in January, 1884, and has also a memorandum of four shot, out of a flock of thirty, in the Alston district, in a former year.

Clangula glaucion. Goldeneye. Spring. Monkhill, April 26th, last seen. Autumn. Allonby, October 21st, one shot by Mr. Thomas Mann. Monkhill, October 24th, a small party. Burgh, December 23rd, a fine adult drake shot by W. Railton.

Somateria mollissima. Eider Duck. Spring. Maryport, March, a party of thirteen seen by Mr. R. Mann, seven in male plumage.

Ædemia nigra. Common Scoter. Autumn and Winter. Silloth. More numerous than usual. An adult male shot on September 3rd, and sent to Mr. Macpherson, retained many of the brown feathers of "eclipse" plumage. Adults and immature birds were obtained from September to the end of the year. Immature males begin to assume the black dress at the end of January.

Ædemia fusca. Velvet Scoter. Autumn. Cargo-on-Eden, December 22nd, an adult male shot.

Mergus merganser. Goosander. Winter, 1885-6. Ullswater Lake, a bird in female dress shot. Mr. Tremble reports that during the year he observed the following species on Monkhill Lough: "Mallard, Teal, Goldeneye, Tufted Duck, *Goosander*, Scaup, and Pochard."

Mergus serrator. Red-breasted Merganser. Spring. Silloth, February 26th, one shot. Silloth, March 13th, an adult male shot, and sent to Mr. Macpherson.

RALLIDÆ. *Crex pratensis*. Corncrake. Spring. Carlisle, April 26th, heard. Allonby, April 28th, seen and heard. Autumn. Eden Lacy, October 7th, one "telegraphed." Carlisle, November 18th, one telegraphed.

Gallinula chloropus. Moorhen. Spring. Sandwith, Lighthouse, April 11th, 3 a.m., a Moorhen committed suicide by striking the lantern. Wind N.N.E., fog, snow.

CHARADRIIDÆ. *Squatarola helvetica*. Grey Plover. Spring. Allonby, May 7th, a party of six observed by Mr. R. Mann. Autumn. Silloth, September, a good-sized flock arrived on the Wampool and Waver estuary. Mr. Low remarks that, "Among those seen were two which still retained the black breasts of summer."

Charadrius morinellus. Dotterel. Spring. Allonby, May 6th and 8th, four Dotterel seen by Mr. R. Mann. Mr. H. P. Senhouse reports the presence of this species on Robinson about the same date.

Gallinago major. Great Snipe. Autumn. Carlisle, October 30th, one shot.

Tringa striata. Purple Sandpiper. Autumn. Silloth, October 30th, one shot.

Calidris arenaria. Sanderling. Spring. Bowness, May 20th, flocks. Autumn. Burgh, December, a large flock.

Tringoides hypoleucos. Common Sandpiper. Spring. Carlisle, April 16th. Millom, April 29th, numerous on estuary. Alston, first noticed May 15th.

Totanus canescens. Greenshank. Spring. Ravenglass, March 26th, last seen. Autumn. Ravenglass, August 16th, first seen.

Limosa lapponica. Bartailed Godwit. Silloth, September, many immature.

NOTE.—Mr. Low reports that Godwits in red plumage passed the entire summer on the Solway in 1886.

Numenius phaeopus. Whimbrel. Spring. Allonby, April 26th, two seen. May 7th, many arrived. May 8th, fifty in one flock, observed by Mr. R. Mann to be feeding in grass and clover fields. May 25th, last seen. Autumn. Allonby, July 24th, one seen; July 27th, two seen.

LARIDÆ. *Sterna fluviatilis*. Common Tern. Spring. Ravenglass, May 3rd, first seen. Rockcliffe, May 4th. Autumn. Ravenglass, September 6th, last seen; strong S.W. wind.

Sterna minuta. Lesser Tern. Spring. Ravenglass, April 29th, first seen on estuary; wind S.S.W. Autumn. Ravenglass, August 28th, last seen; wind N.E.

Sterna cantiaca. Spring. Ravenglass, April 2nd, first arrived at breeding grounds. Allonby, April 16th, a pair seen by Mr. R. Mann. Autumn. Ravenglass, August 23rd, last seen; wind "strong" from N.N.W.

Larus minutus. Little Gull. Autumn. Skinburness, August, two observed by Mr. Low and Mr. Nicol (who has shot the species), towards the end of the month.

Stercorarius crepidatus. Richardson's Skua. Autumn. Mr. Johnston writes from Beckfoot, that he saw several Skuas in the fall of the year.

COLYMBIDÆ. *Colymbus arcticus*. Black-throated Diver. Winter. Silloth, December 29th, one shot in winter dress.

Colymbus septentrionalis. Red-throated Diver. Mr. Low writes that "a good many speckled divers [as well as Scoters and Scaups]" frequented the Wampool estuary during the autumn and winter of 1886.

ALCIDÆ. *Uria grylle*. Black Guillemot. Waver estuary, September 28th, a single bird observed by Mr. W. Duckworth. Prior to its arrival, heavy gales from W. and S.W. had prevailed, accompanied by very high tides.

S U M M A R Y .

A careful study of the data thus collated suggests that the vernal passage of small immigrants was unusually protracted in 1886; though it should be borne in mind, that the first birds observed are usually pioneers, and that at least a month elapses before the bulk of summer visitants have generally completed the passage to their breeding grounds.

In 1886, the Wheatear, Chiff-chaff, and Sand-Martin arrived as usual at the end of March; but the following month was cold, and it was not until May 7th that all the Sylviadæ had arrived. This tardiness of movement was correlated with the prevalence of cold winds, accompanied by an apparent absence of insect life.

Thus, during the week ending April 24th, cold N.E. winds prevailed, and small birds were scarce. The succeeding week proved unsettled, the wind shifting from S.E. to W., and then to N.E., and the birds appeared to be hanging back.

But the week ending May 7th was both warm and fine, and all the loiterers appeared. In commenting on the weather, due regard should of course be paid to the atmospheric conditions prevailing further south, which must have induced the migrants to await favourable opportunities for proceeding northwards.

The vernal notes of Mr. R. Mann indicate, that Whimbrel lingered for a month on the Solway, unless indeed the birds observed were successive instalments which rested and then passed on.

The presence of the Dotterel on the Solway in May is eminently satisfactory.

The vernal movement of Wigeon in an easterly direction closely corresponds with that of 1885, though the rush came ten days later than in the former year.

The influx of Missel Thrushes at St. Bees in April indicates the importance of observations at that station.

Mr. Hodgson's remarks on a great rush of Skylarks in December bear strongly upon Mr. Harvie Brown's remarks in the Migration Report of 1886; while Mr. Eagle Clarke's suggestion, that many migrants pass in autumn from Scotland to North Wales, *via* the Isle of Man, thus *avoiding* the coasts of Cumberland and Lancashire, is full of suggestiveness.

The year 1886 is notable for the absence of certain species in the numbers of former years. Thus, *no* Goldcrests are reported from the coast; while the only Short-eared Owl mentioned by any correspondent was probably a home-bred bird, having been shot at Burgh by Mr. Tremble on September 3rd; on which day, an example was shot in the same district in 1884.

The presence of Grey Shrikes in spring and autumn confirms the supposition that one or other form occurs in Cumberland almost every year.

The absence of the Ruff from the record is to be assigned to the fact that shooting was prohibited on the favourite marsh of that species, during the past autumn. Mr. Tremble remarks, in this connection, that, from the year 1856 to 1885, he invariably met with the Ruff on Burgh Marsh in September.

The year 1886 leaves the census* of the Cumberland avian fauna unaltered; but the occurrences of the Black Redstart, Gadwall, Velvet Scoter, Eider, Great Snipe, Little Gull, Black-throated Diver, and Black Guillemot, present some features of interest.

In conclusion, the Recorders would tender their grateful thanks to Mr. H. P. Senhouse, to Mr. R. Mann, Mr. A. Smith, and other friends already named, whose hearty support has enabled them to prepare the present report.

It cannot be too widely understood, that the writers *desire to receive information* from every quarter. Intimation of rare birds seen or obtained should *always be sent* to the Recorders.

MAMMALIA.

III.—THE QUADRUPEDS OF CUMBERLAND.

(1.) *Vespertilio natterii*. Reddish-grey Bat.

Early in August last a numerous colony of this Bat was discovered by Mr. A. Smith to have become established in an out-house, in immediate proximity to the chimney of the gas works at Castletown. Of three living specimens sent up to Mr. Macpherson, one happened to escape in a room during the afternoon of its arrival, and flew restlessly to and fro with a light and petulant flight. Although of course entirely unaccustomed to its new and strange environment, this bat constantly and with considerably dexterity avoided coming into contact with any external body, until it happened to reach the window panes, when it appeared to be spurred with the hope of escape, fluttering against the panes with all the eagerness of a bird that fails to understand the substantiality of the transparent barrier opposed to its desired exit. Subsequently resuming its interrupted flight, the bat gyrated freely in all directions, usually flying at a height of ten or twelve feet, and wheeling to and fro with enviable grace and buoyancy.

Mr. Duckworth subsequently observed an example which had strayed into a room at Castletown, probably one of those previously evicted from the out-house.

* Captain Johnson of Castlesteads has kindly expressed his impression, that the Spotted Redshank preserved in the Proud Collection (*Birds of Cumberland*, p. 159) was obtained by himself on the continent. The doubt thus thrown on this specimen in no way affects the presence of the species in the county list.

(2.) *Capreolus caprea*. Roe Deer.

The presence of Roe Deer in Cumberland having been doubted in some quarters, for lack of published information, it becomes desirable to state that a limited number of Roe Deer are established near Wigton, in the north of the county. These graceful little deer wander through the largest of our border plantations, occasionally making their appearance in new and unexpected localities. Thus, in 1880, a male Roe, which had no doubted forded the Eden, took up its residence in the Cotehill woods, where it was frequently seen for two years, as reported by Mr. T. H. Horrocks and other gentlemen. Ultimately it disappeared,—no one knew exactly how,—but suspicion fell upon a local poacher who brought a Roe into Carlisle about the time of its supposed decease.

The resident Roes maintain their numbers steadily, but there is no marked increase. The leaves of brambles form an important part of their diet during the winter months.

When visiting the haunts of the Roe on April 23rd, 1886, Mr. Duckworth witnessed an interesting incident. On that day, a Roe which had been reared as a pet by the keeper's children, but had disappeared for a period of eight or nine months, returned to her early home. The school children gathered eagerly around their lost favourite, caressing her and hastening to decorate her slight neck with the insignia of a blue ribbon. The wilder mate, which had accompanied the truant to her early asylum, kept watch in a covert two hundred yards distant, awaiting the return of his partner with manifest concern.

S U M M A R Y .

The continued frost of the spring of 1886, and the heavy fall of snow in May inflicted grievous losses upon the Red Deer (*Cervus elaphus*) of Martindale, and some years must elapse before the mischief can be repaired.

One or two specimens of the Pine Marten (*Martes abietum*,) were recorded as killed in the Lake district during the year.

The occurrence of a dog Badger, weighing eighteen pounds, at Thirlmere, when considered with other evidence, militates against the published opinion of the late Mr. W. Dickinson, F.L.S., that the Badger became extinct in the Lake District at the beginning of the present century.

Mr. J. E. Harting has obligingly called Mr. Macpherson's attention to interesting records published in his essay on Roe Deer; showing that the Roe must have been abundant in east Cumberland in the reign of Charles I., to judge from the number captured for the sovereign upon the Howards' estate at Naworth. On this subject, further information is earnestly desired by the Recorders.

Mr. A. Smith's discovery of the Reddish-grey Bat, at Rockcliffe, raises the number of species of Bats found in Cumberland to six. Of these, the Pipistrelle occurs in great abundance, but the Long-eared Bat is also numerous.

The Whiskered Bat (*Vespertilio mystacinus*), Daubenton's Bat (*Vespertilio daubentonii*), and the Barbastelle (*Barbastellus daubentonii*), were formerly obtained, at least in single instances, by the collectors of the late Mr. T. C. Heysham, in the neighbourhood of Carlisle. At the Heysham sale, the specimens in question entered the collection of Mr. F. Bond, whose kindness enabled Mr. Macpherson to examine them and take transcripts of their labels. It is not known that the Barbastelle or Daubenton's Bat have been obtained in Cumberland since Mr. Heysham's death; but in 1885 the Recorders had the pleasure of identifying a newly captured example of the Whiskered Bat.

The specimen in question was felled during an evening stroll on the south bank of the Eden, by the stroke of a chance umbrella, and was at once sent on to Mr. Macpherson, by James Fell.

During the present year, it is confidently hoped that more progress may be made in investigating the Mammals, and especially the Bats, of Cumberland. *The Recorders are most anxious to receive examples of Bats* (excepting the Long-eared and Pipistrelle) *from all parts of the county.* Specimens should be sent alive, or freshly killed, to the Rev. H. A. MACPHERSON, 3 Kensington Gardens Square, W.; or to Mr. W. DUCKWORTH, 8a George Street, Carlisle.

All incidental expenses are gladly borne by the Recorders.

BRAMPTON IN 1745.

BY REV. H. WHITEHEAD.

(Read at Carlisle, March 22nd, 1887.)

WHEN, on Sunday, November 10th, 1745, Prince Charles Stuart was about to begin the siege of Carlisle, hearing that Marshal Wade was expected from Newcastle, he changed his plans, determining to march eastward, so as to engage the English on hilly ground, his Highlanders being accustomed to such ground, and next morning marched with the greater part of his army to Brampton; where, having probably intended to stay but a single night, he remained a week—more than twice as long as he stayed anywhere else in England, and a sixth part of the whole period of his campaign on this side of the Border.

To the inhabitants of Brampton he may have caused some temporary inconvenience: for which, however, he made ample amends by providing them for the rest of their lives with something highly interesting to talk about; the traditions of which have ever since held the foremost place in the otherwise uneventful annals of that quiet little town.

“They came down the Lonning”, said old David Latimer,* relating to me what he had heard in his youth from eye-witnesses of the Highlanders’ arrival at Brampton, “and took possession of the chapel, where a number of them ate, drank, and slept”.

* He died in 1881, aged eighty-four. All statements as to ages of persons mentioned in this paper have been verified, wherever possible, by reference to registers, tombstones, and family bibles.

There was at that time no other entrance into Brampton from Carlisle than "down the Lonning"; and to persons coming that way into the town the chapel of the almshouses, on the site of which now stands the parish church, would be almost the first large building which presented itself to their notice.

The prince selected for himself the house now occupied by Mr. W. Hetherington, draper, in High Cross Street; the stables adjoining which house have only of late years ceased to be called the "cavalry stables"; and another house in the same street, to this day known as "the barracks", by its name hands on the tradition of the use to which it once was put.

Charles, whilst his soldiers were establishing themselves in these "barracks" and other quarters in and around Brampton, occupied himself with writing a letter, dated "Brampton, Nov. 11, 1745", and signed "Charles Prince Regent", in which he informed his correspondent, Lord Barrymore, who lived in Cheshire, that he expected soon to take Carlisle, and to be in Cheshire before the 24th inst., when he hoped that all his friends in that county would be ready to join him. (Ewald's *Life of Prince Charles Stuart*, vol. i. p. 260).

It was this confident expectation of being joined by great numbers of English Jacobites which justified to his mind his having taken the hazardous step of invading England. He fully reckoned upon being not only welcomed, but also assisted, as a deliverer.

He was therefore very anxious that his troops should be on their best behaviour during their march southward, and not unnecessarily molest the inhabitants of the districts through which they had occasion to pass; a line of policy which his officers and the more intelligent of their men consistently followed. Thus on the day of their arrival at Brampton, Nov. 11, his "lifeguards", described as "well-dressed good-looking men", are stated to have been at Naworth Castle, where "they behaved with complaisance" (Mounsey's *Carlisle in 1745*, p. 44). Sergeant Clark, of Brampton, now in his eighty-third year, says that when a boy he heard one Mary Gardner, who was eleven years old in 1745, relate that one day,

when Lord George Murray and his staff were dining in her father's farmhouse at Westlinton, some Highlanders looked in, but seeing who were there backed out. When Lord George and his party had finished their dinner they asked what they had to pay. Being told there was nothing to pay, "Well", said his lordship, "I believe we have saved you more than we have got". Host and guest, no doubt, parted very good friends.

But some of the rank and file, unless they have been maligned, were not content with dining off what was set before them in the farmhouses which they visited. The "lifeguards" might behave "with complaisance" at Naworth Castle. Meanwhile some of their comrades are alleged to have been "hunting and destroying the sheep of Lord Carlisle's tenants, and bearing off the country people's geese and other poultry" (Ray's *History of the Rebellion of 1745*, p. 95); which they are said to have done in spite of remonstrance from their officers, who "expressed great dissatisfaction, but could not restrain them" (Mounsey, p. 44).

Such men as these got the whole army a bad name, and occasioned alarm for lives more precious than those of sheep and geese. The late Mr. T. Routledge, currier, of Brampton, who died in October last, aged seventy-five, told me that he remembered having heard his grandmother say that she and other children were sent off to Nether Denton to be out of the way of the Highlanders. She did not tell him, however, and perhaps herself never knew, the fate of which they were supposed to have been in danger. The following story, related by one who was in the prince's army, throws light on this matter:—

Mr. Halkstone, whilst the army lay at Carlisle, was taken ill, and went with a few of his companions to a farmer's house in the neighbourhood, where he remained several days. Perceiving his landlady to be a young woman he asked her if she had any children and where they were. When she found that he was no cannibal, she told him the truth was that all the children were sent out of the way for fear the Highlanders should devour them (The Chevalier de Johnstone's *Memoirs of the Rebellion in 1745*, p. 101).

Cameron of Lochiel, at one place where he stayed a night, was told by his landlady that "everybody said the Highlanders ate

children and made them their common food". On his assuring her that they did nothing of the kind "she opened a press, calling out with a loud voice: 'Come out, children, the gentleman will not eat you'" (*ib*).

But, if the sending away of children from Brampton was an unnecessary measure, perhaps the precaution taken by Mr. Bell, of the Townfoot farm, as related to me by his great-granddaughter, was not out of place; he hid his plate in a draw-well. Many families in the northern counties have a tradition of the burying of their ancestral plate in 1745. Churchwardens, too, in many places concealed their communion plate; as at Penrith, where the church accounts record "expenses for securing church plate in Rebellion", and at All Saints, Newcastle, where five shillings were paid "to gravedigger for concealing and secreting church plate". It may be hoped that it is not solely owing to such precautions that nowhere in the diocese of Carlisle is there any tradition of church plate having been plundered in 1745.* On November 11, however, as related by Dr. Waugh, then chancellor of the diocese, "a party that came to Stanwix, said to be commanded by Glenbucket", after gutting the vicarage, "destroyed the parish books† and registers" (Mounsey, p. 64); a "superfluity of naughtiness", difficult to account for except by supposing that they were disappointed at not finding the church plate.

His object in marching to Brampton having been to encounter Marshal Wade, who was believed to be coming from Newcastle to the relief of Carlisle, but was not yet reported as near at hand,

* Had there been any such tradition, it would not have escaped the knowledge of the compilers of the book on "Old Church Plate in the Diocese of Carlisle", published by Thurnam in 1882.

† The then curate of Stanwix, Mr. Robert Wardale, writing to the chancellor about the loss of the registers, said: "I should be glad of your directions how to proceed in this particular" (Mounsey, p. 203). What directions, if any, the chancellor gave, there is nothing to shew. If he gave the right directions, they were not followed; for there is still no copy at Stanwix of the missing registers. It is not too late, however, to advise the present vicar "how to proceed in this particular". He should get permission from the bishop's registrar to take a copy of the transcripts; which, from about the time of the Restoration, are preserved in the episcopal registry at Carlisle. By so doing, as it is known that even in 1703 there was no register extant at Stanwix of earlier date than 1662 (Bp. Nicolson's *Visitation*, p. 105), he will be able to recover all the contents of the registers which Gordon of Glenbucket's men destroyed.

the prince, on Tuesday, the 12th, held a council of war, at which he proposed that they should march further eastward to meet Wade. But after much discussion it was resolved that part of the army should return to besiege Carlisle, while the remainder should stay at Brampton.

So next morning, Wednesday, the 13th, several regiments left Brampton with orders to wait for the prince at Warwick Bridge, half-way between Brampton and Carlisle. About noon he arrived, and led them on to within sight of the city, when he left them, and returned with his guards to Brampton. The regiments marched on to Carlisle, and at once set to work opening the trenches.

The story of the siege of Carlisle is too well known to need repeating here. But, on behalf of the people of Cumberland and Westmorland, "whose courage", as Mr. Mounsey truly says, "has been proved during centuries of border warfare both regular and predatory", it is right to mention that the ignominious surrender of the city by the militia of those counties is best accounted for by the theory that "the conduct of the militia had its origin in a leaning towards the Stuarts, or at least an indifference towards the house of Hanover" (*ib.* p. 98).

On Friday, the 15th, the prince still remaining at Brampton, from which place he dictated the terms of surrender, the duke of Perth entered and took possession of the city.

The surrender was greatly against the will of Colonel Durand, the castle garrison, the majority of the citizens, and some of the militia officers, one of whom, Mr. Joseph Dacre, of Kirklington Hall, father of Rosemary Dacre, whose romantic story forms the subject of an interesting paper by Miss Goodwin in the "Cumberland and Westmorland Archæological Transactions" (vol. viii, pp. 237-244), and great-grandfather of the present vicar of Irthington, when the health of the Prince as Regent was drunk in the market place by the Highlanders, "deliberately proposed the health of King George" (Mounsey, p. 50).

On Saturday, the 16th, the duke of Perth "proclaimed King James, attended by the mayor and civil officers in their robes,

with their sword and mace"; and, if it was on the same day that "the keys of the city were presented to the prince at Brampton by the mayor and corporation on their knees" (*ib*), the mayor and his colleagues had enough of humiliation for one day. Especially the mayor, Thomas Pattison, who however was only the deputy-mayor, must have keenly felt his position when he remembered his grandiloquent letter of the 13th inst. to Lord Lonsdale :

I told your Lordship that we would defend this city. Its proving true gives me pleasure, and more so since we have outdone Edinburgh, nay, all Scotland. . . . If you think proper I would have you mention our success to the duke of Newcastle and to General Wade (Ewald i, 258).

His lordship did think proper to mention it to the duke of Newcastle, and the duke thought proper to mention it to the king, who ordered the duke to write and congratulate Mr. Pattison upon "the great honour the town of Carlisle has gained by setting this example of firmness and resolution" (*ib*, 259). And he, poor man, now down on his knees at Brampton, delivering up the keys of Carlisle !

Whether Lord Lonsdale also thought proper to mention what he had heard from Pattison to General Wade, we do not know. If he did, then he only confirmed Wade in his opinion that there was no need for him to march at all to the relief of Carlisle ; for on November 10th, the very day when the rumour reached Carlisle that he was marching from Newcastle, he had written a letter to Colonel Durand to the effect that as "the rebels" would probably "proceed to Lancashire" without stopping to besiege Carlisle, he saw no necessity for coming to his assistance (Mounsey, p. 47). Nor was it until Thursday, the 16th, that having heard of the siege he left Newcastle only to learn on arriving at Hexham that Carlisle had surrendered. Then he returned to Newcastle, bitterly complaining of the state of the roads.*

* Which, five years later, he was commissioned to repair, when he made what has ever since been known as the "military way" from Newcastle to Carlisle ; no doubt an excellent road ; but, as to make a good foundation for it he placed it wherever he could on the site of the Roman Wall, which he threw down to its lowest course for that purpose, his memory is held in no greater esteem by antiquaries than by military critics.

It was doubtless to be ready for Wade, in case he should come on, that Charles remained as long as he did at Brampton.

Some interesting particulars relating to his stay at Brampton are given in the following extracts from his household book (Jefferson's *History of Carlisle*, p. 73):—

November 12.—At Brampton, Tuesday, to 4½ stone bife at 2d, 12s; to 1 sheepe, 6s; to 11¼ stone bife at 2d, 1£ 10s; to 2 sheepe, 14s; to 10 poulets, 3s 6d; to 2 geese, 2s 2d; to 5 ducks, 3s 4d.

November 13.—At Brampton, Wednesday; Carlisle besieged by the Duke of Perth and his regiment.

November 14.—At Brampton (when the prince was at Brampton he went one day to Squire Warwick's house and dined there) Thursday, 3 chickens, 1s; 12 do, 3s; 4 ducks, 2s 8d; 4 hens, 2s 6d; 2 ducks, 1s 4d; 5 hens, 1s 8d; 5 chickens, 1s 8d; 3 ducks, 2s; 3 hens, 2s; 9 hens, 6s; pd for 77½ pd butter, at 4d, 1£ 5s 10d; pd for 17 pd do, at 4½d, 6s 4½d.

November 15.—Friday, Carlisle surrendered to the Duke of Perth and his regiment, who would not be relieved.

November 16 and 17.—The Prince still at Brampton, Saturday and Sunday.

From which items it is evident that the prince, unlike the marauders who are alleged to have shot sheep and geese, regularly paid for all that he and his lifeguards consumed; which indeed according to all accounts was his invariable custom.

That a good deal of unauthorised foraging was done by some of the rougher sort of his followers is confirmed by the traditions of many farm houses in the neighbourhood of Brampton. But Brampton tradition is comparatively silent about plunder of any other kind. Mr. George Howard, on my asking him whether the Highlanders committed any depredations at Naworth Castle, said there was at that time very little there to plunder, Lord Carlisle and his family being non-resident; and the only thing known to have been taken from the castle in 1745 was the lace from off the hangings of a bed which had been the portion of the first Lady Carlisle. It is to be hoped this was not taken by the prince's lifeguards. Others there were, of less "complaisance", prowling about during that week; to whom let us impute this act of spoliation. But, whoever they were, they left behind at the castle some of their own property, which one would think was more valuable to

them at such a time than any amount of lace, viz., a halbert, pike, and javelin ; on one of which weapons is the date 1745.

They seem to have had a way of leaving such things behind ; for at the Half-Moon in Brampton, then kept by the great-great-grandfather of the present landlord, Mr. Thomas Thompson, where according to tradition in Mr. Thompson's family eight troopers were quartered, one of them on the departure of the army left behind a sword, which has ever since remained at the Half-Moon.* It is what is called a "dress sword", one worn by officers at balls or on state occasions, and may therefore have belonged to some one of distinction.

Of persons of distinction there was no lack in that army. Indeed there were too many of them for the good of the cause they had at heart ; which their mutual jealousy did much to weaken. Nor was the prince as discreet as he should have been in his mode of dealing with this jealousy ; as is indicated by the exclusive reference in his household book to the "Duke of Perth and his regiment", as if they alone were engaged in the siege of Carlisle. No doubt they did the chief part of the work, such as it was, during the siege. Nor did they join in a demand, made by some of the besiegers, that the men remaining in Brampton should take their turn in the trenches ; which explains the note in the household

* Doubts having been expressed in some quarters as to the genuineness of weapons said to have been left behind by the Highlanders in 1745, it may be as well to state that the five generations through which the story of the sword at the Half Moon has been handed down may be practically reduced to three, as shewn by the following pedigree, the dates in which are taken from Brampton parish register :

John Thompson	...	born	—	...	died	1774
Joseph Thompson	...	"	1738	..	"	1812
Joseph Thompson	...	"	1764	...	"	1838
Joseph Thompson	...	"	1793	..	"	1859
Thomas Thompson	...	"	1818	...	"	—

Now Joseph the second, who died when Thomas, who is still living, was twenty years old, always said that the sword had been in the house ever since he could remember anything, and that his father (Joseph the first) and grandfather (John), the former of whom died when he (Joseph the second) was forty-eight, and the latter when he was ten, both of whom were eye-witnesses of the stay of the eight troopers at the Half Moon, always spoke of it as having been left behind when the army quitted Brampton to resume the siege of Carlisle. The Half Moon, I may here state, as a fact having an interest of its own, is the only house in the town of Brampton, as far as I know, now inhabited by a member of the family which occupied it in 1745.

book that they "would not be relieved". But it was fortunate for the duke, who was an incapable commander, that the city surrendered as it did; since his arrangements for conducting the siege, in the opinion of the prince's ablest general, Lord George Murray, were very defective.

The visit to "Squire Warwick's house", mentioned in the household book, "was, no doubt", says Mr. Mounsey, "on the 13th", the day of "the muster at Warwick Bridge". The squire, though a Jacobite and a Roman Catholic, was prudently "out of the way", leaving the prince to be entertained by his wife, "a daughter of Thomas Howard, of Corby Castle, of a family which had fought and bled for Charles the First". So pleased was the prince with his reception at Warwick Hall that "he observed that these were the first Christian people he had met with since he crossed the Border" (Mounsey, p. 45-6).

Bearing in mind that observation we must assign to a later day in the same week a visit which he is alleged to have paid about that time to another Jacobite family. The late Mr. W. H. Henfrey, the well-known numismatist, wrote to me some years ago, stating that there was a tradition in his family, corroborated by letters and other documents in his possession, that his great-great-grandparents, whose name was Hetherington, but of whose residence he only knew that it was somewhere in Cumberland, had on one occasion entertained Prince Charles Stuart in the '45; and he asked me to aid him in his endeavours to localize them. This led to my having much correspondence with Mr. Henfrey, who in one of his letters said:—

Mrs. Hetherington, who was a great Jacobite, subsequently left Cumberland, and came with her daughters (she had no son) to reside in London. She was a great friend of Lady Primrose; and both ladies hid and entertained Prince Charles Edward when he paid his secret visits to London. It is now known for certain that on one of those visits he was formally received into the Protestant faith at the church of St. Mary-le-Strand. I have an independent family account of this interesting occurrence; which Mrs. Hetherington greatly assisted in bringing about. I have also the Bible the prince used on the occasion.

In another letter he informed me that Mrs. Hetherington's eldest daughter, Ann, who was married to his great-grandfather, a captain in the Guards, at Hampton church, in 1770, used to describe how "she remembered kissing the prince's hand with great ceremony when she was quite a little girl; when she noticed the webbing of his fingers, though he wore long ruffles to disguise it". The second daughter, Jane, was married in 1771 to Benjamin Wilson, historical painter, and became mother of the famous general Sir Robert Wilson. Of the third and youngest daughter, Mary, he had no information. The object of our investigation was to find the baptismal certificates of these three sisters, which of course would indicate their parents' residence. Many parish registers did I search for this purpose; but lost my way among the innumerable Hetheringtons of Brampton and its vicinity.

Near Warwick Bridge, on Wednesday, the 13th, while the prince was dining at the hall close by, there was busy work going on, exacted from unwilling hands, in the neighbouring woods. The *Carlisle Patriot* of February 24, 1821, in its obituary had the following paragraph:—

At Brampton on Sunday last, at the extreme age of 101, Mr. John Heward, carpenter. This venerable man worked 60 years in the employment of the Earl of Carlisle, and daily walked to his labour a distance of three miles till he was 96, and was generally the first person on the spot. During the rebellion of 1745 he was pressed by the rebels, who conveyed him to Corby, and there compelled him to make ladders, with which they designed to scale the walls of Carlisle. Whilst engaged in this employment he saw Prince Charlie, and picked up from various sources considerable information as to that young adventurer's operations, which he was fond of relating to the day of his death.

That Brampton carpenters were taken by the Highlanders on November 13th to Warwick Bridge and forced to make ladders is a historical fact; recorded by the *Gentleman's Magazine* of the period (vol. xvi, p. 604) in its "Advices from the North"; also attested by Mr. Israel Bennett, formerly Presbyterian minister at Brampton, who before November in 1745 had removed to Carlisle (Mounsey, p. 68). The reason why the Highlanders were under the necessity of having new ladders made was because there were

none at hand for them to beg, borrow, or steal, Colonel Durand having taken the precaution of requesting the county magistrates "to issue warrants for bringing into the town (Carlisle) all the ladders within seven miles round and further, which was immediately complied with and the ladders brought in" (*ib.*, p. 73). John Heward, who survived his work at Warwick Bridge seventy-six years, must needs have died a very old man. His age, in Brampton parish register and on his tombstone, is given as a hundred. But he was not quite a centenarian; for, according to the register of his native parish, Kirkclinton, his parents were married November 10, 1719; their eldest child, Eleanor, was baptized December 4, 1720; and John, their second child, was baptized March 18, 1721-2 (old style). He had therefore at his death almost, if not quite, entered his hundredth year. His grand-daughter, Miss Lydia Hewitt, of Brampton, now in her eighty-fourth year, says she had long in her possession an account which he wrote of his adventures whilst with the army; which she cannot now find. It is to be hoped it may yet be recovered. Meanwhile Miss Hewitt, who in her seventeenth year heard part of the story of the '45 from one who was a grown man when he made ladders for Prince Charlie, is an interesting link with one of the most romantic episodes of the last century.

Another Brampton man, destined to achieve greater notoriety than John Heward as a reputed centenarian, and well remembered by some old persons still living in or near Brampton, was in 1745 with the militia at Carlisle; the famous Robert Bowman, whose epitaph in Irthington churchyard states that "he died 18th June, 1823, at the patriarchal age of 119 years". I call him a Brampton man, not because of his alleged birth at Briggwoodfoot, Brampton, in 1705, but because of his description in 1755 as "of this parish" in his marriage register at Brampton. His experience as a defender of Carlisle was thus related by himself to the late Mr. Robert Bell of Irthington Nook:

The cannon balls were coming rattling into the town from Stanwix Bank like hail; and besides we were starving of hunger. For my part I had nothing but a basin of broth during three days; so in the night I scrambled over the city wall, and cut off for home (R. Bell's *Tractate on the Roman Wall*, p. 9).

To the late Dr. Barnes, who took great interest in his case, he gave a different account of the length of his stay with the militia ; for “laughing heartily he confessed that he remained among the soldiers only one night, and ran away as soon as he could” (*All the Year Round*, vol. x, p. 212). Yet, amongst other reasons advanced for admitting his claim to extreme longevity, great stress has always been laid on the alleged accuracy of his memory ; which, says Mr. Bell, was “excellent even up to the time of his death”. It may be thought that a discrepancy of a day or two between his accounts to Mr. Bell and Dr. Barnes of the length of his stay at Carlisle is no great matter. Perhaps so ; but what are we to think of his “cannon balls rattling into the town like hail” when we read the following statement of one of the besiegers, and find it confirmed by history?—

We did not discharge a single shot, lest the garrison should become acquainted with the smallness of their calibre, which might have encouraged them to defend themselves (Chevalier de Johnstone, p. 58).

Either, then, Mr. Bowman’s memory was not as good as has been thought, or he was somewhat given to romancing.*

The following story of another reputed centenarian, whom it needs not an old inhabitant of Brampton to remember, I record as told to me by the late Mr. Robert Campbell, locksmith, of Brampton, who died in 1881, aged eighty-three. He said that his father, also named Robert, a native of Argyllshire, when but a lad, joined the prince’s army in Scotland ; accompanied it to Brampton and Carlisle ; but left it at Penrith ; then went and lived several years at Newcastle ; was there pressed into the Marines ; was present at the taking of Quebec (1759) ; lived afterwards some time at Annan ; and then took up his abode at Brampton,

* I dont know whether it is owing to what I wrote some years ago, in our “Archæological Transactions” (vol. v, pp. 33-8), on “Robert Bowman’s supposed baptismal register”, that to this day I receive letters bearing the Carlisle postmark, and containing paragraphs, cut from newspapers, about persons alleged to have died, or to be still living, over the age of a hundred years. But, as I have never said, and do not believe, that no one ever reaches that age, I am at a loss to conceive what purpose is served by sending me such paragraphs ; for surely every case of alleged centenarianism must stand or fall on its own ground, and can derive no support from any number of other cases.

where, as stated in the parish register, he married Margaret Thompson in 1791, and died in 1839 at the alleged age of one hundred and eight. That Robert Campbell the younger told this story exactly as he had it from his father no one who knew him will doubt; for he was a very truthful, staid, sober-minded man. Nor, apart from the question of his father's age is there anything improbable in the story itself; for it is certain that boys of fourteen years of age did cross the border with the prince (Ewald, i, 276). But Robert Campbell the elder's reputed age I was never able to verify, as his son could not tell me to which parish in Argyllshire to write for his baptismal register.

Brampton parish register, by the way, has this entry in 1745 :

Nov. 13. John son of Archibald Henderson of Argyllshire baptized.

The occurrence of this baptism during the occupation of Brampton by the Highlanders, if merely a coincidence, is a very curious one; for the description of Archibald Henderson as "of Argyllshire" stamps him a stranger in Brampton.

The vicar who baptized the child, Mr. John Thomas, father of Dr. Thomas, bishop of Rochester, had evidently not thought it necessary to leave the town because of the presence of the invading army. 'Of course not', it may be said. Well, but the records of Brampton Presbyterian church, in 1745, contain this memorandum :

November 10 and 17. No sermon the min^r being out of ye town
because ye rebels were in it.

The minister seems to have been rather in a hurry to get out of the town; for on the first of those two Sundays, November 10, only a few straggling Highlanders could have arrived. I don't think that his predecessor, Mr. Israel Bennett, would have been "out of ye town" at such a time; for Mr. Bennett, who was then at Carlisle, where he was one of those who protested against the conduct of the militia, was, with others, commended by Chancellor Waugh as having behaved "with coolness and resolution" (Mounsey, p. 52). But, though the vicar did not leave the town, there may yet have been "no sermon", or Sunday service of any kind, in the parish church, at all events on November 17; for there was

the difficulty about praying for King George. The chancellor, writing about what happened on that day at Carlisle, says :

After the Rebels got possession I was detained in town till near night on Sunday, the 17th, to try me whether I would allow prayers to be read in the churches without naming the King (*ib.*, p. 56).

This, he says, he "absolutely refused", though he had "two messages from the Pretender's son, and one from their Duke of Perth, for that purpose". The prince, however, though he may have sent a similar message to the vicar of Brampton, would probably bear him no malice, even if he did pray for King George; for when urged in Edinburgh to punish Mr. McVicar, minister of the West church, for not only praying for King George, but for stoutly asserting his right to the throne, he replied that "the man was an honest fool, and he would not have him disturbed". Most persons will probably say, with Sir Walter Scott, that they "do not know whether it was out of gratitude for this immunity" that Mr. McVicar, on the following Sunday, after praying as usual for King George, continued: "As to this young person who has come among us seeking an earthly crown, do Thou, in Thy great mercy, grant him an heavenly one" (*Tales of a Grandfather*, ch. lxxix).

Some accounts of the '45 represent the prince as having made his entry into Carlisle on November 17. But it is clearly shown by his household book that he spent that Sunday in Brampton. It may therefore have been on that day that he received the keys of Carlisle from the deputy-mayor and the corporation. The late Mr. G. Hetherington, of Brampton, who died in 1881, aged eighty-three, told me that he had often heard his grandmother, Elizabeth Smith, who died in 1813, aged eighty-nine, describe the crowd and commotion in High Cross Street, Brampton, on that occasion.

Among that crowd she said she well remembered having seen one Margaret Ewing, a girl of sixteen, who had come with the army from Scotland. That girls did accompany the army we know from what is recorded as having happened at the crossing of the river Esk, then much swollen from recent floods, on their way back to Scotland :

None were lost, except a few girls, who, for love of the white cockade, had followed the army, throughout the whole of its singular march, with an heroic devotion which deserved a better fate (Chambers' *History of the Rebellion in 1745*, 1st ed., vol. i, p. 238).

From such a fate, at all events from the risk of it, Margaret Ewing saved herself, when, on the departure of the Highlanders from Brampton, she voluntarily chose to be the girl they left behind them. Penrith parish register in 1748 has this entry :

Dec. 28. John Richardson and Margaret Ewing both of Brampton married.

John Richardson was of the ancient yeoman family of the Richardsons of Easby, a township of Brampton ; and on the death of his father in 1759 he succeeded to the small estate at Easby, about forty-five acres, which is known from the "Book of the Barony of Gilsland" to have been in the possession of his ancestors in 1603, and may have been so for centuries earlier. He died in 1799, aged seventy-three. His wife, Margaret, was a remarkable woman, believed by her Brampton contemporaries to have been of a noble house. "But if so," says a local record, "she kept her secret well, as she was in no way communicative to those about her, not even to her husband, who always stood in great awe of her" (Cheesbrough's *Brampton Almanac*). She died in 1813, aged eighty-four, leaving the estate to her grandson, Richard Richardson ; and it is said that she left it to him on the condition that he inscribed on her tombstone the following epitaph :

Here rest my old bones ; my vexation now ends ;
I have lived far too long for myself and my friends.
As for churchyards, and grounds which the parsons call holy,
'Tis a rank piece of priestcraft, and founded in folly ;
In short I despise them ; and as for my soul,
It may rise the last day with my bones from this hole ;
But about the next world I ne'er troubled my pate ;
If no better than this, I beseech thee, O Fate,
When millions of bodies rise up in a riot,
O, pray, let the bones of old Margaret lie quiet !

The record goes on to say that "the then vicar of the parish, his attention having been called to this epitaph, sent a copy of it to

the chancellor of the diocese, who at once hastened to Brampton, and actually stood over the mason, one George Rowell, until he had picked out the objectionable lines with a chisel and mallet". That the vicar knew nothing about the epitaph until his attention was called to it may to some appear strange. But the churchyard is a mile and a half from the church, vicarage, and town; and in later times a tombstone has occasionally been placed there without the knowledge of the vicar. The chancellor, however, I think, must have ordered the stone to be altogether broken up; for the stone which now surmounts Margaret Richardson's grave does not look as if it had ever borne any other inscription than her present epitaph, which consists of ten lines, orthodox enough to have been composed by the chancellor himself, beginning thus :

Throughout the world's immeasurable space
Go, sinful man, and learn thy God to trace !

Mr. A. Ormiston, Carlisle diocesan surveyor, writing to me about the original epitaph, says :

An old friend of mine, Elizabeth Story (née Burgess), born August 26, 1772, who lived for many years at Irthington, and died at Warwick in 1856, often informed me that she had seen the tombstone, and that it was a common practice amongst young folk to gather together in Brampton churchyard for the purpose of reading the strange epitaph on old Margaret. Her testimony was borne out by another old person whom I knew, Elizabeth Armstrong, who died in 1858, aged seventy-four, and was buried at Lanercost.

Mrs. Story's version of the epitaph, copied from her dictation by Mr. Ormiston, is identical with that given in the local almanac with the single exception of the word "lie" instead of "rest" in the first line. Mrs. Barton, of the Crescent, Carlisle, whose late husband was a grandson of John and Margaret Richardson, has a version which, besides differing as to several words from that received by Mr. Ormiston from Mrs. Story, omits altogether the two middle lines.*

* Mr. J. C. Jeaffreson, who in his "Book about Doctors" (p. 203) says that this epitaph was written by Dr. Messenger Monsey, physician to Chelsea Hospital, who died in 1788, aged ninety-five, also omits the two middle lines, and gives the last four thus :

Almost as mysterious a personage as Margaret Richardson, and equally reserved about his private history, was one Lachlan Murray,* of whose antecedents nothing was ever known on this side of the border beyond the fact of his having come from Scotland in the '45. Whether he left the army during the siege of Carlisle, or during the retreat from Derby, certain it is that he did not return to Scotland, but settled himself at Irthington, two and a half miles from Brampton, where he kept a school, taught land-surveying, became parish clerk, and died in 1801, aged eighty. He must have gained great reputation for versatility of talent, since in 1788, as shewn by the vestry minutes, he was entrusted with the work of "drawing a plan for a new church". Nor is it necessary to suppose, because no new church was built, that he proved unequal to the occasion; for the prudent vestry, while preferring on second thoughts a more economical plan, shewed unabated confidence in him by requesting him to prepare "rates, advertisements, &c., for repairing" the old church. The worst thing known about him is that he could not, or at all events did not, prevent his wife, who kept a grocer's shop, from using the leaves of the parish register as wrappers for tea, cheese, and tobacco.†

The prince left Brampton on Monday, November 18, to make his triumphal entry into Carlisle, mounted on a white charger, preceded by a hundred pipers, and welcomed by a peal from the

What the next world may be I ne'er trouble my pate;
And, be what it may, I beseech thee, O Fate,
When bodies of millions rise up in a riot,
To let the old carcase of Monsey lie quiet.

The first four lines as given by Mr. Jeaffreson agree exactly with the version quoted by me from the local almanac.

* The authority for everything here stated about Lachlan Murray, apart from the register and vestry minutes, is Mr. Thomas Graham, of Beanlands, Irthington, now in his sixty-ninth year, whose grandmother, from whom he heard the story, died in 1838, aged ninety-five. Mr. Graham, whose fore-elders, alternating all the way down as Thomas and David, have owned Beanlands since 1607, has often proved himself an invaluable depository of local tradition.

† There is therefore now no register at Irthington of earlier date than 1704, and there is a gap from 1722 to 1729. The present vicar then will do well to "proceed in this particular" after the method which I have recommended to the vicar of Stanwix (*ante*, p. 50).

cathedral bells, traditionally believed to have been the last they ever rang. But from a recent note in the *Carlisle Patriot*, by "X Y Z", who has had access to the books of the dean and chapter, it appears that the bells were rung on the recapture of the city by the duke of Cumberland, and on many other occasions down to 1763.

Sir Walter Scott, then, committed no anachronism when he described Fergus MacIvor as drawn to the scene of his execution to the sound of "a muffled peal, tolled from the neighbouring cathedral" (*Waverley*, ch. lxix).

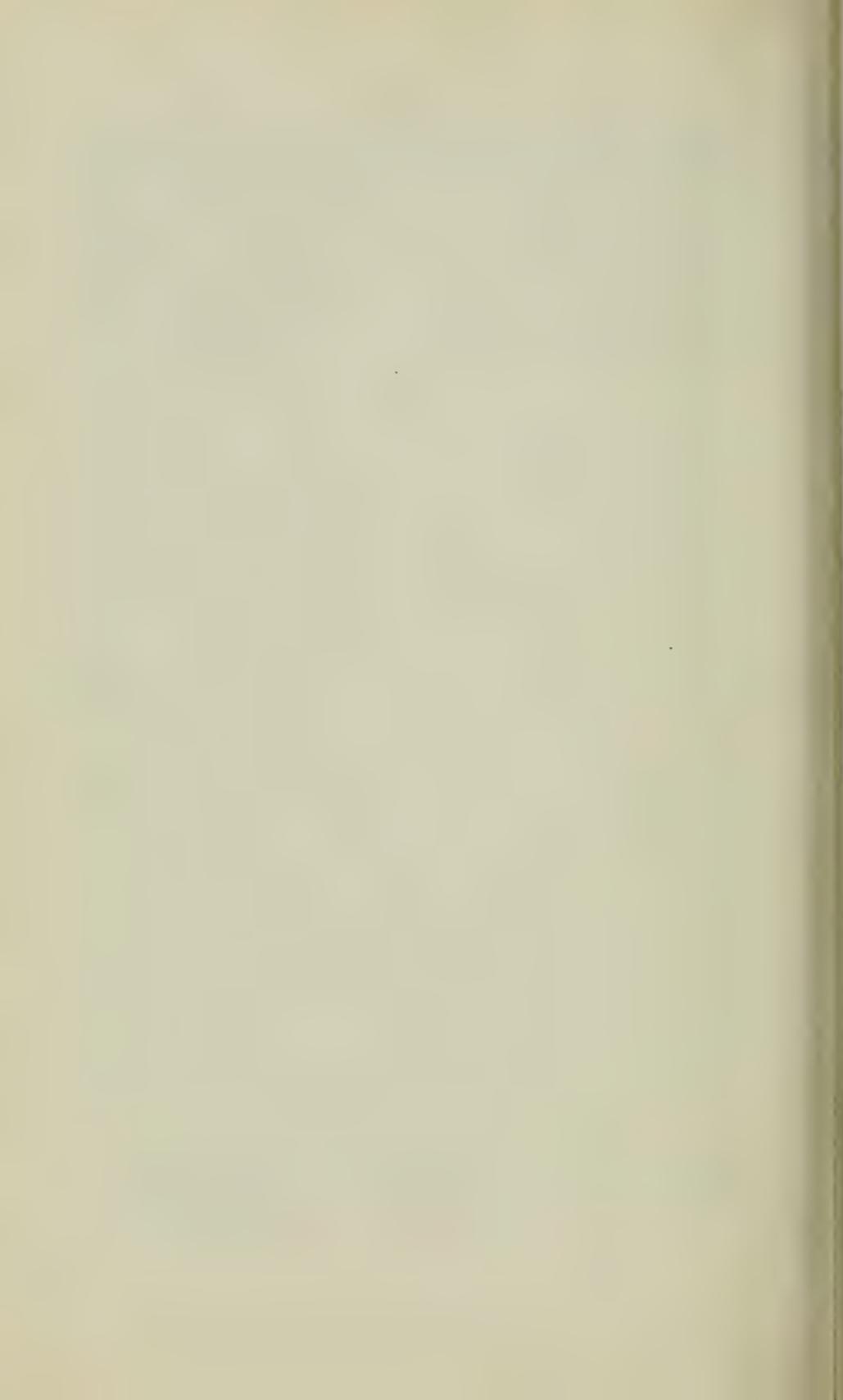
It was on Saturday, October 18, 1746, that Major Donald Macdonald, of Tyendrish, the original of Fergus MacIvor, with eight others, was executed on Gallows Hill at Harraby (Mounsey, p. 268). Referring to one of the eight, in a letter to the then Lord Albemarle, written on the following Thursday, October 23, Lieutenant Colonel Howard, the governor of Carlisle castle, said:

Buchanan's body was afterwards brought into town and interred, at which ceremony Dr. Douglas, Mr. Graham the apothecary, Mr. Lowry, and Mr. Campbell of Brampton, assisted publicly; the latter as mourner, the other three as pall bearers (Lord Albemarle's *Fifty Years of My Life*).

In the same letter he said: "Six others suffered last Tuesday at Brampton". One can easily believe that so fascinating a prince as Charles Edward had not stayed a week at Brampton without attracting to his cause the sympathy of some of the inhabitants; of whom "Mr. Campbell of Brampton" would seem to have been a prominent representative; and it may have been as a warning to them that six of the condemned prisoners were sent from Carlisle to be executed at Brampton. Those six were Col. James Innes, Peter Lindsay, Ronald Macdonald, Thomas Park, Peter Taylor, and Michael Delard (Mounsey, p. 268). Tradition says they were hanged on the Capon Tree;* which for many years afterwards was

* Said by Hutchinson (i. 129) to have derived this name from the capons with which the judges and their retinue, on their way from Newcastle to Carlisle, formerly regaled themselves under its shade. In Hutchinson's time (1794) it had "apparently withstood the blasts of several hundred years". Nothing now remains of it but its stump.

supposed to be haunted. It was even believed, says the writer of a local tale, called "The Tragedy of the Capon Tree", sent to me about six or seven years ago by some unknown friend, that "on the anniversary of the day of execution the spirits of the rebels were to be seen flitting about with airy ropes round their necks". They have now, with the generation which stood in awe of them, flitted altogether away; and the once famous oak which they haunted is itself a thing of the past.



FORMER SOCIAL LIFE IN CUMBERLAND AND WESTMORLAND.

BY W. WILSON.

(Read at Keswick.)

THE most probable account of the origin of the peasant proprietors called "statesmen" is, that their tenure is not feudal, but allodial, in so far as that they acquired their estates at a very remote period, either by establishing themselves on unoccupied lands (like the squatters in Australia or America), or by the conquest of previous possessors. The evidence in favour of this opinion is—1st, That all the estates in the dales are of customary tenure—copyhold tenure only occurring as a very rare exception. Now, if the "statesmen" had been enfranchised villeins, they would have held their lands by copyhold, as do enfranchised villeins in other parts of England. The fact that they have, since the establishment of feudality, paid lord's rent, heriots, and other charges to the several lords of manors, is no proof that they really held their estates from them in virtue of such payments; because freeholders, elsewhere, are compelled thus to acknowledge the authority of the courts of the manors in which their freeholds lie.

2nd, Several "statesmen" can prove that the estates they now possess have descended uninterruptedly in their families since the time of Richard II., and always as customary freeholds. One family—the Holmes of Mardale—have inherited their land in unbroken succession from one John Holme, who came from Norway in the year 1060, settled in Lincolnshire, and afterwards

removed to Mardale; thus, probably, obtaining possession of his land before any Norman feudal lord had ever established a claim upon it. Mr. Hugh P. Holme, who died last spring, after but a short illness, at the old family residence, Chapel Howe, Mardale, was the last male representative of this remarkable family. He was a good specimen of a Westmorland "statesman," being a fine looking young fellow, with a splendid physique, and moreover possessed of superior business talent and a kindly disposition, he became very popular. He was unmarried, and his premature death when just attaining the prime of life, caused the deepest regret among a large circle of friends.

3rd, Another, though but a negative proof, that the origin of our "statesmen" is independent of, and anterior to, the Norman conquest, is, that Cumberland and Westmorland are not mentioned in Domesday Book.

4th, This opinion derives much support from the fact that when James I. came to the throne of England, he set up a claim to all the small estates in Cumberland and Westmorland, on the plea that the possessors—the "statesmen" in fact—were merely tenants of the crown. This is strong evidence that they were not the vassals or tenants of any other feudal lord. But the manner in which the "statesmen" replied to the king's demand seems to be conclusive. They met, to the number of 2,000, between Kendal and Staveley, at a place called Ratten Heath, convened by one Brunskill, and adopted the resolution that "they had won their lands by the sword, and felt themselves able to defend them by the same means." On these and other grounds, it seems probable that the "statesmen" of Cumberland and Westmorland entered on their lands in very remote times, either as conquerors or squatters; and that the feudal system introduced by the Norman conqueror was but an episode in their existence. During the days of its power they were compelled, in order to obtain the protection of the feudal lords, to submit to their yoke, though more in form than in substance; but they existed before its rise, and they have survived its fall.

Any one acquainted with the fell dales must have observed that

many of the farm-houses now are turned into cottages or out-houses, while others lie in ruins ; from whence it may be inferred that the tenements (or holdings) must, at one time, have been much smaller and more numerous than at present. That this was actually the case, in one instance, at least, we have direct proof, for it is on record that Queen Catherine, wife of Charles II., held thirty-nine customary tenements in Grasmere. I have also ascertained that at the beginning of the present century there were as many as twenty-six "statesmen" in Grasmere—men who each kept a few cows, and a small stock of sheep on the common. Such was probably about the number of "statesmen" in the vale when the poet Gray passed through it. In his description of Grasmere, the poet mentions that "not a single red tile—no gentleman's flaring house or garden, breaks in upon the repose of this little unsuspected paradise ; but all is peace, rusticity, and happy poverty, in its neatest and most becoming attire." Could the poet now re-visit Grasmere, he would hardly be able to recognize it. Of gentlemen's houses there are an abundance, and but one "statesman" properly so called remains. But, perhaps, the change which Grasmere more than any other of our mountain valleys, has undergone in a comparatively short period, is most strikingly illustrated by comparing the Grasmere of to-day with Grasmere as depicted by Wordsworth, who lived there for some years about the beginning of the century. He describes it as a perfect republic of shepherds and agriculturists, among whom the plough of each man was confined to the maintenance of his own family, or the occasional accommodation of his neighbour. Two or three cows furnished each family with milk and cheese. The chapel was the only edifice that presided over these dwellings—the supreme head of this pure commonwealth, the members of which existed in the midst of a powerful empire, like an ideal society, or an organized community, whose constitution was imposed and regulated by the mountains which protected it. Owing to the smallness of the estates, there was not sufficient employment in farm work at all times for a "statesman" and his family, and carding, spinning, and weaving formed the employment of the winter months, and of any spare

moments during the rest of the year. The men carded and the women spun the wool yielded by the previous clipping. Almost every household had its weaving shop, in which one or more looms were kept; and many of the dalesmen were able to weave the cloth which served for their own wear, and for that of their families. The linsey-woolsey dresses worn by the women were homespun, and they also manufactured linen for the various domestic purposes for which it was required. After a web of woollen cloth was turned out of the loom, it was taken to the beck, and soaked in the water; it was then placed on a flat stone, called the "battling stone," and well beaten with a wooden mallet. This process was called milling—a primitive operation which had to serve all the elaborate processes which woollen cloth now passes through at the mill of the fuller. The inhabitants of the dales manufactured more cloth and yarn than was sufficient to supply their own wants, and the overplus was taken to market and sold to traders from a distance. There is a tradition that when the plague raged in Keswick, about the year 1665, and a few years afterwards, as no market was held in the town, for fear of infection, the people of the dales carried their webs and yarn to a large stone, which is very conspicuous on one of the lower elevations of Armboth Fell, and there periodically met and did business with the traders. The stone still goes by the name of the "web-stone." The application of machinery to the processes of carding and spinning, had the effect of transferring these branches of industry from the houses of the dalesmen (of whom the majority were "statesmen") to the manufacturing towns—and this seems to have been one of the chief causes of the decline of the "statesmen." After losing their occupation, no other could be found so suitable for filling up spare time. Sufficient employment for large families was not to be found at home, and the sons and daughters of the old "statesmen" were often thought too good to send to service. The consequence was, that they were frequently brought up in idleness. To use a local expression—the "heaf" was outstocked. Debts accumulated, and thus the estates, one by one, have come into the market, and passed into the hands of large proprietors

In some instances they have been bought by the great manufacturers, who have thus absorbed, first the trade, and then the lands, of the old "statesmen."

The costume of the dalesmen is sometimes described as having been picturesque. As before stated, the material of which it was made was homespun, and frequently undyed, black and white fleeces being mixed to save the expense of dying. It is curious to observe that this homely material, which is still made in some parts of Scotland and Ireland, has lately been pronounced by fashion to be superior for country wear to the most finished products of the steam loom; so that now, the most elegant ladies do not disdain to wear dresses of the selfsame homespun of which our ancestors made their "kelt coats." These coats were ornamented with brass buttons, as were the waistcoats, which were made open in front for *best*, in order to show a frilled shirt breast. Knee breeches were the fashion for centuries. They were buttoned tight round the body above the haunches, so as to keep up without braces, which are of modern invention. Those used for *best* had a knot of ribbon and four or five bright buttons at the knee; and those who could afford it, had them made of buckskin. Their stockings, which were a conspicuous part of the dress, were also made from their own wool, their colour being generally blue or grey. On their feet they wore clogs on ordinary occasions, but when dressed in holiday costume, they had low shoes fastened with buckles, which were sometimes of silver. At the present day this style of dress is nearly obsolete in our vales: but some of the old dalesmen still adhere to what was the fashion of their youth. Some four or five years ago, four of the old "statesmen" of the district happened to meet at Grasmere fair, and stood talking together for some time. After a while one of them noticed that all four were dressed in knee breeches, and thinking it a strange chance which had brought together what, in these degenerate days, were probably about the only four pairs of breeches left in the county, they agreed that it formed a fitting occasion for a friendly glass and a good "crack" about "auld lang syne." Of these men it may be said, that they were a connecting link between the old times and the new, and

that they were probably some of the last men to wear the costume of a bygone age.

The dress of the women was not less primitive than that of the men. They wore homespun linsey-woolsey petticoats and long-tailed bedgowns, a blue linen apron completing their attire. The statesman's daughter who first communicated to her native dale a knowledge of the glories of printed calico, in the shape of a smart print dress, is said to have created a tremendous sensation, and more than a nine days' wonder.

The clogs worn by the women differed from those of the men in being pointed at the toes, and having brass instead of iron clasps. Their bonnets were made of pasteboard covered with black silk, and in shape somewhat resembled a coal-scuttle: the front projecting nearly a foot beyond the face of the wearer. Bonnets were bonnets in those days, and served to protect the head and face from sun or rain.

In the eastern and northern parts of Cumberland, the peasantry formerly lived in houses called "clay daubins," which were made of clay and roofed with thatch. When a rustic couple were about to go to housekeeping, after it was decided they should start life in a "clay daubin," a suitable site was first of all secured, and then a day appointed on which their friends and neighbours met at the place, each taking a spade and some provisions with him; and by their united efforts on such occasions, the walls of the humble dwelling were generally finished before the day was over. A good meal was in the meantime provided for the workers and other invited guests who afterwards joined them, and the company usually spent the night in what Anderson, the Cumberland bard, terms "glorious fun and divarsion." By giving a quotation from his song called "The Clay Daubin," we shall be able form some idea of the manner in which these Cumbrians used to enjoy themselves in the good old time:—

We went owre to Deavie's clay daubin,
 An' faith a rare caper we had;
 Wi' eatin', an' drinkin', an' dancin',
 An' rwoarin' an' singin' like mad.

Wi' crackin', an' jwokin', an' braggin',
 An' fratchin' an' feightin' an' aw,
 Sec glorious fun an' divarsion
 Was ne'er seen in castle or ha'.

Sing hey for a snug clay biggin,
 An' lasses that like a bit sport ;
 Wi' friends an' plenty to gie them,
 We'll laugh at King George an' his court.

In the 'Lake Country, stone and slate being plentiful, no other building materials seem to have been used. The houses were of rude construction, being built (as indeed they are still) of unhewn stone, but with far less care about jointing, and fewer "through stones" than are thought necessary now. In the oldest houses in the more remote dales, no mortar seems to have been used—probably from the difficulty of obtaining lime, for in some instances clay has been used as a substitute. They were roofed with rough slates, nearly as thick as flag-stones, and said not to have been in all cases taken from quarries, but to have been split from stones lying on the surface. The timber used in the construction of the houses was all heart of oak. Doors, floors, and window frames were all of the same material. The beams were made of whole trees roughly squared, while the smaller rafters and joists were split. The carpenters of those days used very few nails, wooden pins being made to serve the same purpose. In houses of the usual size, there were seldom more than three rooms on the ground floor, viz., the dwelling apartment, or house-part, the dairy, and the parlour. The parlour was generally used as the bedroom of the master and mistress. The house-part was a sort of best kitchen, and was the ordinary sitting-room of the family. There was frequently an out-kitchen, called the down-house, in which washing, baking, brewing, etc., were carried on. Long after the use of coal and fire-grates had become general throughout England, our dalesmen still continued to burn peats and wood upon the open hearth. Indeed it was not until nearly half of the present century had elapsed, that railway communication making coal cheaper, and the increased value of labour making peat dearer,

coal finally superseded turf, and, as a necessary consequence, open fire places gave place to grates. The old chimneys had no flues, and were funnel-shaped, being very wide at the bottom and gradually contracting to the top, where there was an aperture of the size of an ordinary chimney, through which the smoke escaped. In these open chimneys hams, legs of beef, flitches of bacon, and whole carcasses of mutton were hung to dry for winter consumption. Mr. Clark, in his *Survey of the Lakes*, mentions having seen as many as seven carcasses of mutton hanging in one chimney in Borrowdale, and was told that some chimneys in the vale contained more. Very few of these old-fashioned chimneys are now to be found in the country. The staircase was made of stone, and the space above was sometimes undivided, and seldom made into more than two rooms, which were called lofts, and used as the sleeping apartments. They were unceiled, and open to the roof, which was so rudely constructed that light could often be seen through the chinks; and when a driving snowstorm came, it was no uncommon thing for the people in bed to have a covering of several inches of snow over the bed-clothes. Most of the old buildings had a porch before the outer door, and the door was made of massive oak, two planks thick, and fastened together with wooden pins, which were put in parallel rows, about three or four inches apart, and left projecting about three-quarters of an inch on the outside. The "freshwood," or threshold, was the lower side of the wooden frame which contained the door. It stood four or five inches high, and people going in or out were obliged to step over it. Mr. Clark tells us that there was a degree of sanctity attached to the threshold of a door, and certain charms were, in his time, remembered, which had their effect only in that place. A good specimen of a door of this kind may be seen at the old farm house at Armboth. The planks of which it is made are fastened together with six hundred and thirty-one of the above-mentioned oaken pegs. In these busy times, we could make a dozen doors in the time it took our ancestors to make the six hundred and thirty-one oaken pegs.

The food of the dalesmen was simple, being confined almost

entirely to the products of their farms. They consumed a large quantity of animal food; and as sheep and cattle were in the best condition for slaughtering in autumn, it was then that the dalesmen stocked their wide chimneys with a supply of meat for the winter and spring. No animals were slaughtered in spring, for having been on short commons all the winter, they were too lean to kill for food. It must be borne in mind that oilcake and "Thorley's food for cattle" were not yet in existence. Tea, coffee, and wheaten bread, now so common, were then little known in our dales; almost the only bread our ancestors ate was "haver-bread," or oatcake; and their "poddish," a most important part of their diet, was but the same meal boiled instead of baked. They brewed their own ale, and drank it at nearly every meal. Such, together with milk, butter, and cheese, the produce of their own dairies, was the food of our forefathers. No doubt they lived well in their way. After tea, coffee, and sugar came into more general use, it is said that an old dalesman remarked that "he wonder't what t' warl wad cum teu efter a bit, when fwoks noo-a-days couldn't git the'r breakfast wi'out hevin' stuff frae beàth East an' West Indies."

Until about the middle of last century, the roads of the country were in a wretched state. Instead of wheeled carriages, pack-horses, and in some cases sledges, were used for conveying merchandise from one place to another. There is an old man now living in Grasmere whose grandmother could remember the present church bells being brought to Grasmere on sledges by the old road over the top of White Moss, then the main road between Ambleside and Grasmere. Then there is the old story about the first lime ever taken into Borrowdale. It was, so the story goes, conveyed thither in a sack, on the back of a horse, and when the man in charge of it got as far as Grange Bridge, a heavy thunder-shower came on, and the lime began to smoke and grow hot in the sack; to stop this, he poured some water on it (which he brought in his hat from the beck), which increased the smoke so much that, thinking there must be some devilry in smoke which was increased by water, he took fright, threw his load into the beck, and galloped home.

Here, as elsewhere, most of the travelling used to be performed on horseback. A man and his wife often rode to market together on the same horse, the woman sitting behind on a pillion. But the dalesmen were by no means particular about the appearance of their turn-out: a piece of turf dried and cut into the proper shape, was frequently used for a saddle. In other cases, what was called a "pad" was used, which was made of straw. Sometimes, on market-days, after business was over, such of the farmers as were convivially disposed, stayed on at the public-house holding "crack" and drinking until a late hour. While a spree of this kind was going on, the hungry horses have been known to break loose in the stable, and by the time their riders were ready to go home, saddles and bridles were all eaten, and the roystering old farmers had to ride home bareback.

Ploughing was attended with hard labour to the ploughman, and it required at least three men, and as many horses, to work one plough. The horses were yoked one before another, and it was one man's work to drive them; a second man had to hold the plough-beam down, to prevent the plough from slipping out; the third man had to guide the plough, which required by far the most skill. If this man was not very expert, or if the land was difficult to turn over, the services of a fourth man were required, who, with a pick and spade, turned up places which could not be done by the plough. Not much skill or labour was bestowed on making a plough. It was nothing unusual for a tree to be growing in the morning, to be cut down during the day, and made into a plough with which a good stroke of work was done before night.

The dalesmen of the olden time worked much harder, though perhaps not so regularly as their descendants of the present day. Their hours of labour were much longer, and a great part of what was their hardest work, is now performed by machinery. Though ignorant and unpolished, they were honest and hospitable, and possessed good natural abilities. A hundred years ago, the division of labour was nowhere so systematically carried out as it is now, and in remote places like our dales, many a farmer, in addition to the cultivation of his land, followed, with more or less success,

various handicrafts, for each of which we now employ a separate workman.

An extraordinary instance of this diversified ability, joined to unwearying industry, is presented by the life of the Rev. Robert Walker of Seathwaite, generally known as "wonderful Walker." Although he lived in obscurity, he found a biographer in no less a person than the poet Wordsworth, who gives a very interesting account of him in the notes to his "Sonnets of the Duddon." The parish priest, so finely delineated in "The Excursion," is also a picture of wonderful Walker. He was born in 1709, and was the son of a small "statesman" who lived in Seathwaite. He was the youngest of twelve, and a weakly child, on which latter account his father gave him what schooling he could. At the age of seventeen he went to be schoolmaster at Gosforth, near Egremont, and remained there two or three years; he then removed to Buttermere, where he acted both as minister and schoolmaster, and received the usual small salary and "whittlegate." Before and after school hours, he laboured at manual occupation. He wrote his own sermons, and did duty twice on Sundays. In summer he rose between three and four, and went to the field—in hay-time with his scythe, in harvest-time with his sickle. He ploughed, he planted, he tended sheep on the fells. At other times he clipped or salved—all for hire. When engaged in these employments, he would be at work long before the regular labourers, and remain after they had finished their day's work. Nor was he less skilful than diligent: in all such labours he excelled. In winter he occupied himself in reading, writing his sermons, spinning and making his own clothes and those of his family (he was an excellent spinner), knitting and mending his own stockings, and making his own shoes, the leather of which was of his own tanning. In his walks he never neglected to gather and bring home the wool from the hedges. He was the physician and lawyer of his parishioners; he drew up their wills, conveyances, bonds, etc.; wrote all their letters and settled their accounts, and frequently went to market with sheep or wool for the farmers. The next step in his career was his removal from

Buttermere to Torver, on the banks of Coniston-water, and taking priest's orders, soon after which he took to wife a respectable maid servant, whose affections he had gained at Buttermere, and who brought him a fortune of forty pounds, which he forthwith invested in the funds. Shortly after marriage he obtained the curacy of Seathwaite, where he lived and officiated for sixty-seven years. At the time of wonderful Walker's appointment, and for many years afterwards, Seathwaite church was without pews. He used it as a school-room, and is described as seated in his favourite place, near the communion table, wearing a cloak of his own making. His great-grandson tells us that, when the family was in want of cloth, he would take his spinning-wheel with him to the school, where he also kept a cradle—of course of his own making. Not unfrequently the wheel, the cradle, and the scholars all claiming his attention at the same moment, taxed the ingenuity of even wonderful Walker to keep them all going. The chapel was afterwards pewed, and a new school built. To the already long catalogue of his attainments and pursuits must be added a knowledge of fossils and plants, and a habit of observing the stars and winds. Indeed the atmosphere was one of his favourite studies: he made many experiments on its nature and properties. In summer he used to collect butterflies and other insects, and by his entertaining descriptions of them, amused and instructed his children. After a long and useful life, which extended over nearly the whole of the last century, he died on the 25th June, 1802, in the ninety-third year of his age. In the course of his long life he had, besides bringing up and settling in life a family of twelve children, amassed the sum of £2,000; the accumulation of which, when we consider the marvellous industry and self-denial which it represented, might of itself entitle him to the name of "wonderful." He was a hero in humble life—a greater hero than many in whose honour monuments have been erected.

Many of the chapels in our fell dales were extremely small, not affording room for more than half-a-dozen families; but the former chapel at Buttermere, where wonderful Walker entered on his sacred duties, was the smallest of all. It was, in fact, the smallest

church in England, its walls measuring only seventeen feet in length on the outside. Wordsworth describes it as being scarcely larger than many of the single stones or fragments of rock lying near it. Like so many other chapels of the same class, it has been rebuilt. In the notes to Mr. White's *Lays and Legends of the English Lake Country*, there is some interesting information about the chapelries in the fell dales, from which some of the following particulars are taken. He tells us that the curacy of Buttermere was certified to the governors of Queen Anne's bounty at one pound yearly, paid by the contributions of the inhabitants; it was also certified that this chapel and Wythop were served by readers, except when the curate of Lorton officiated in them, three or four times a year. Such curacies were held in these northern counties by unordained persons, until about the middle of George II.'s reign, when the bishops came to the resolution that no one should officiate who was not in orders. But, to avoid injustice to those already officiating, they were admitted to deacon's orders without any preliminary examination. The reader, as he was called, at the chapel in the vale of Newlands, received this kind of ordination, he also exercised the various trades of clogger, tailor, and butter-print maker. But the pay of a reader was so trifling, that he could only maintain himself by the aid of some secular employment. Even the livings were, many of them, not worth more than two or three pounds a year; and the ministers were therefore, in a great measure, dependant upon the voluntary contributions of their parishioners. Their stipends, besides the small money payment above named, comprised "clothes yearly, and whittlegate." "Clothes yearly," meant one suit of clothes, two pairs of shoes, and one pair of clogs—more or less, according to the bargain made. Mr. Clark gives the following explanation of the term "whittlegate." "*Whittlegate* meant two or three weeks' victuals at each house, according to the ability of the inhabitants, which was settled among themselves; so that the minister could go his course as regularly as the sun, and complete it annually. Few houses having more knives than one or two, the pastor was often obliged to buy his own knife, or 'whittle.' Sometimes it was

bought for him by the chapel-wardens." He marched from house to house with his "whittle," seeking "fresh fields and pastures new," and, as master of the herd, he had the elbow chair at the table head, which was often made of part of a hollow ash tree—a kind of seat then common. The reader at Wythburn had for his salary three pounds yearly, a hempen sark or shirt, a whittlegate, and a goosegate, or right to depasture a flock of geese on Helvellyn. A story is still told in Wythburn of a minister who had but two sermons, which he preached in turn. The walls of the chapel were at that time unplastered, and the sermons were usually placed in a hole in the wall behind the pulpit. One Sunday, before the service began, some mischievous person pushed the sermons so far into the hole that they could not be got out with the hand. When the time came for the sermon, the priest tried in vain to get them out. He then turned to the congregation and told them what had happened. He could touch them, he said, with his forefinger, but could not get his thumb in to grasp them; "But, however," said he, "I can read you a chapter out of Job that's worth both of them put together!"

A curious custom existed at one time, of holding market at the church. In Cumberland, as of old in Judea, the "house of prayer" seems to have been turned, if not into "a den of thieves," at least into a common mart. In 1306 the inhabitants of Cockermouth represented in a petition to Parliament that there was a great concourse of people every Sunday at Crosthwaite church, when corn, flour, peas, beans, meat, fish, and other kinds of merchandise, were bought and sold; which was so very injurious to the market at Cockermouth, that the persons of that place who farmed the tolls of the king were unable to pay their rent. Upon this a prohibitory proclamation was issued against the unseemly usage. At the time of the Restoration of Charles II., tradition says that the butcher market at Wigton was held on Sunday, and the butchers hung the carcasses even at the church door, to attract the notice of their customers as they went in and came out of church. It was even no uncommon thing for people who had made their bargains before the service began, to hang their joints of meat over the backs of

their seats until the ceremony was concluded. The zealous priest, after long and ineffectual endeavours to make his congregation sensible of the indecency of such practices, undertook a journey to London, on foot, for the purpose of petitioning the king to have the market day held on Tuesday: which favour he is said to have had interest enough to obtain. Though such practices as these have been long discontinued, there are people now living who can recollect hearing the clerk give out in the churchyard, before the congregation dispersed, the advertisements of the various sales about to be held in the neighbourhood. In some places it was the custom for the churchwardens to go round the village during divine service, and drive all the loungers into church. In large churches there was usually a choir of singers, but seldom, until quite recently, in the smaller ones. The clerk was generally leader of the band, and after blowing the pitch-pipe, he used to intone on the key-note the first line of the psalm to be sung. Some twenty or thirty years ago, the inhabitants of a parish in this district engaged a singing-master to teach the church singers some new tunes. He found his pupils not inapt—most of them being able to read music. But when the music came to be wedded to Tate and Brady's "immortal verse," certain old gentlemen who sang bass were detected in substituting for the sacred words the inappropriate and monotonous syllables "boom, boom." One of them, on being remonstrated with, thus replied: "Yer ways may be aw varra weel, but they dunnet suit me; I allus dud sing *bum, bum*, an' I allus will sing *bum, bum!*"

Our dalesmen have always been more or less musical. Some songs that were in vogue several hundred years ago, are still occasionally sung—chiefly at the hiring fairs, by itinerant ballad singers. As a proof of the extreme antiquity of some of the tunes, I may adduce the curious fact, that the air of "St. Dunstan's Hunt's up," mentioned by Sir Walter Scott as long lost and forgotten, is still played on the fiddle from house to house every Christmas eve, in many of the dales. In pursuance of a very ancient custom, a fiddler goes the round of the vale on that evening, bids "good night!" to each member of every household

by name, and after each greeting plays the tune of "St. Dunstan's Hunt's up."

But I should draw but an imperfect picture of our dalesmen, past or present, if I failed to notice their festivities and their sports. The former were, generally speaking, confined to two seasons—the sheep-shearings or "clippin's" in summer, and the great winter festival of Christmas. In former days, Christmas was far more of a holiday than it is now. From Christmas-day until Twelfth Night, all work was thrown aside, and the time devoted to feasting and merry-making. Fiddling and dancing, "merry neets," and "oald wife haiks," attracted old and young. For graphic descriptions of these festive gatherings, as they were in the time of our forefathers, I must refer you to the ballads of Anderson, "blin' Stagg," Mark Lonsdale, and other Cumbrian bards who were eye-witnesses and sharers in the revels. The clipping feasts were much the same as those with which we are familiar now-a-days, except that the fun was, perhaps, more uproarious.

The great and characteristic sport of Cumberland and Westmorland has always been wrestling. Our north country mode of wrestling differs from—and, as we love to think, excels—anything of the kind practised in other parts of England, or, indeed, of Europe. But as the wrestling ring is, happily, not a bygone institution, but, on the contrary, as any one who cares to see a good "warsle," may easily gratify his wish, it is unnecessary to enter into a minute description of this sport.

The ancient and barbarous sports of cock-fighting, bull-baiting, and badger-baiting were popular in this, as in other counties, until the year 1835, when they were prohibited by Parliament. It now seems a wonder that they were not suppressed long before that time: their influence on the community must have been brutalising. Cockfighting was an amusement in which our ancestors took great interest, and much care was bestowed in breeding and training game cocks to fight mains or matches. It is not my intention at present to give any description of this barbarous sport, but I may mention that Shrovetide was the favourite season when the great cockfights came off. Near several old inns in the district the site of the

cockpit may still be seen ; and we can easily imagine the excitement attending the cockfights which took place there, and the scenes of revelry that followed. In Keswick a large iron ring was formerly fixed in a stone block in the market place ; this was called the bull-ring, and to this a bull, previous to being slaughtered, was fastened by the ring in its nose, and then baited and bitten by savage dogs amid dreadful bellowing, till the poor beast was almost covered with foam, and quite exhausted. Great excitement prevailed when a bull was being baited, and large numbers assembled to witness the sport. On such occasions the market-place at Keswick was crowded, and many, in order to obtain a good view, might be seen sitting on the roofs of the adjoining houses. I need scarcely remind you that there were no three or four storey houses surrounding the market-place in those days. Beyond the excitement which the exhibitions produced among the spectators, the system was thought to be of great value in improving the quality of the beef, an aged bull being especially tough unless well baited before slaughtering. In the celebrated Borrowdale letter, a young shepherd from that valley writes home to a friend, and, among other matters, gives him the account of his passage from Whitehaven to Dublin by the boat, which he termed a "sea nag." He describes how "the sea nag was gitten cowdy," and that "it canter'd up wi' tae end an' doon wi' t' tudder, when he telt a man to twine t' tail on't, as they dui swine, or bulls when they carry them to bait at Kessick, an' they willn't ga on." When the flesh of a bull was exposed for sale, it was the rule in Keswick, and probably elsewhere, to burn candles during the day on the stall on which the meat was exposed for sale, in order that customers might be aware of the quality of the meat sold there.

When an assemblage of people took place in the town, if a man shook the bull ring, it was understood to mean a challenge to fight any one present ; this often led to pugilistic encounters, the same as the Irishman's invitation at Donnybrook fair, for anyone to tread on the tail of his coat. "Greit Jacob Howe," who belonged to a well-known family of brothers then living at Applethwaite, and who are still remembered in the neighbourhood as very

powerful fellows, is said to have been the last man to shake the bull ring in Keswick.

Hunting and hound-trailing may be mentioned, with the latter of which we are all familiar. Our dalesmen have always been keen hunters; but the mountains among which they lived have impressed their sport with a peculiar character of wildness and unconventionality, rendering fox-hunting among the fells quite a distinct sport from fox-hunting as it is understood in Leicestershire. One distinctive feature of fell-hunting is, that the hounds can only be followed on foot; but another modifying circumstance, not less important, is, that among the fells, most of the hunters are also shepherds, who look upon the fox as their natural enemy, whose death is to be compassed by any means and at all seasons. Until quite a recent period, a few couples of hounds were kept in every dale, and at least as many terriers; and when the presence of a fox in the neighbourhood was betrayed by a missing lamb, or an old wife's hen-roost being robbed, all the dogs, and nearly all the men, in the parish commenced—no matter what the time of year—a pursuit, which generally ended in the death of the offending fox, unless he had the luck to escape into some "borrant" or other stronghold. But even then the pursuit was not always abandoned. About twelve years ago, a fox escaped from the hunters into the inaccessible crevice of a rock near Stickle Tarn. For three weeks a party of from thirty to seventy Langdale men staid by him night and day, blasting the rock by day, and placing a stone before the crevice to prevent his escape by night. At last a wet night drove them down to the valley, and when some of them returned next morning, the stone placed before the crevice was gone, and so was the fox. Gone! beyond even the reach of John Peel's view hallo! The mystery of his escape has never been solved; but the prevailing idea has always been, that "some Gursmer chap mud ha' done it!"

Though our dalesfolk do not seem to have been at any time so much the slaves of superstition as were many more refined and educated communities, still many superstitious customs—though few of them strictly local—prevailed among them in olden times. Of these I shall only furnish one instance—that of the "needfire"

—which has been practised in our own day. The “needfire,” which was probably the last remains of fire worship in this country, took its name from the Danish word *nöd* (pronounced *need*), which signifies cattle; whence our English neat herd. “It was once,” says Mr. Sullivan, “an annual observance, and is still occasionally employed in the dales and some other localities, as a charm for the various diseases to which cattle are liable. All the fires in the village are first carefully put out—a deputation going round to each house to see that not a spark remains. Two pieces of wood are then ignited by friction, and within the influence of the fire thus kindled the cattle are brought. The scene is one of dire bellowing and confusion: but the owner is especially anxious that his animals should get ‘plenty of the reek.’ The charm being ended in one village, may be transferred to the next, and thus propagated as far as it is required.” Miss Martineau, in her *Guide to the Lakes*, tells a story of a certain farmer who, “when all his cattle had been passed through the fire, subjected an ailing wife to the same potent charm.” The last time the “needfire” was used in this neighbourhood was in 1841, when in some parts of Cumberland and Westmorland there was an epidemic amongst the cattle. It was brought over the Raise, and transferred from farm to farm through the vales. But, at one farm a few miles out of Keswick, the sacred fire was allowed to become extinct, the owner, a well-known “statesman,” not having sufficient faith in its virtue to take the trouble to transmit it, or even to keep it alight. He tells me that he was severely rated at the time for his lack of faith. It is now upwards of thirty years since the “needfire” was last used as a charm to preserve cattle from infection; and during that time a great change has been effected in the enlightenment of the people. The rinderpest was the severest visitation of the kind we have had this century, but no one thought of trying the “needfire,” which has no doubt gone its last round.

We still have among us men of the old school, who believe in charms and ghosts and the like, but their number grows “small by degrees and beautifully less.” Some people, especially the aged, are apt to talk of the “good old times,” as if at some indefinite

period, long ago, all had been perfection, and, ever since, things had gradually deteriorated. But this golden age is unknown to history, which on the contrary, paints the past of this Borderland especially in sombre colours. In "the good old times," moss-troopers and border-raiders harried our lands; lifted our cattle; and if we resisted, took our lives into the bargain. Now our only invaders are armies of peaceful tourists, who, though they may rob our district of some of its romance, repay us richly in material prosperity.

OUR SUMMER VISITORS.

PART III.

BY TOM DUCKWORTH.

(Read at Carlisle.)

IN my previous papers on our Summer Visitors, I alluded more particularly to the different Warblers; but now I must confine myself to those who are not remarkable for their songs, but more for their peculiar characteristics. The first of these is

THE RING OUZEL, *Turdus torquatus*,

which frequents the mountainous parts of temperate Europe. In this district it is fairly plentiful all along the Pennine range, although they have slightly decreased in the Ullswater district; but according to the observations of others, and also my own, they have increased on the eastern fells during these latter years. It arrives early as a rule, as I have known it to be in the Croglin district in the end of March: but the first week in April is the average time. It has many local names, but here it is known as the "Fell Thristle" and the "Mountain Blackbird." I once saw a good number of these birds in the neighbourhood of Durdar, very early in the season, feeding on the ivy berries; but the next day not one was to be seen—they were all off to their breeding places. The name Ring Ouzel, as given to this bird, is quite a misnomer, as in fact it has no ring round its neck at all—simply a white crescentic mark a little below its throat. In spring they

arrive in considerable numbers ; but they soon separate and take up their stations on our fell sides and the moorlands adjoining thereto.

In the spring of 1865 I was located in the wilds of North Wales when the Ring Ouzels arrived, the male birds first ; and a few days after the females put in an appearance, and in an incredibly short space of time they were paired, and distributed over the mountain sides ; their cheery songs burst from every coign of vantage, and made the valleys ring with their spring roundelay. They love to frequent sequestered gills, and especially where the fell becks dash over the boulders. Unlike his congeners, the Fieldfare and the Redwing, who only winter here, he is the only species of thrush who comes from the "sunny south" to spend the summer with us. This is something unaccountable. Here we have three birds of the same species, whose food is nearly the same, yet two come in autumn and stay with us all the winter, then depart in spring to Sweden and Norway to breed : while another travels from Central Africa to breed in our mountain solitudes. The Ring Ouzel also visits Sweden and Norway ; and Mr. Hewitson, when on a visit to the latter country, for the purpose of studying the habits of the Fieldfare and Redwing, mentions how the most bleak and desolate islands were enlivened with its song : it often delighted him in his midnight visits amongst the islands.

In my rambles on our fells, I love to see him flitting before me from point to point, and uttering his call note of "tuk—tuk—tuk," and have often been startled by the shrill clarion of the bird, whom you may see perched like a sentinel on some jutting crag, or on some stunted root of a tree, or a small bush, and protesting against your approach. They object most decidedly to your presence upon their preserves, especially when the female is sitting, or when the young are just hatched out. I have seen the male bird fly in circles around us, and at us, until we had removed some distance from the nest. It will also use all sorts of stratagems, feigning to be wounded, and tumbling before one with drooping wings. If you have a dog with you, woe betide it, as the parent

birds will not let it have any peace. I remember well walking with one of my fell friends and his collie. Two birds pursued the dog with harsh wild cries, and flew close to him, as if attempting to strike him with their wings. The dog was bewildered, and came up to us as if to know what to do; but, however, the birds gave us the same salute, until we shifted a considerable way from the place.

The Ring Ouzel is a bold, handsome, and pugnacious bird; and when flying from rock to rock, his white gorget shows beautifully contrasted with his dark plumage. His song is difficult to describe—a mixture of the song of the Missel Thrush, some notes of the Song Thrush, and a little of the Blackbird's song. It is a desultory sort of strain: after a few lilt of song, he stops and looks around him, as if daring any one to contradict him, then breaks forth with a few harsh notes, as if deriding his own melody.

If you should happen to come upon the Ring Ouzel suddenly, so as to startle him, he flies away making the hills resound with his harsh cries, startling the Meadow Pipits, the Red Grouse, the Stonechat, and the Wheatear, and putting them all on the look out; he causes quite a consternation amongst all the birds in the locality.

Bechstein thinks the voice of this species; though hoarser and deeper, more agreeable than that of the Blackbird. Tastes differ; I think the contrary. I have known instances where this bird has been tamed and made a charming pet. If my memory does not fail me, the Rev. H. A. Macpherson had one, which was a great favourite.

These birds lose no time in starting to build, as I have seen their nests, with the eggs in different stages of incubation, in the last week of April and the first week in May; the young are fully fledged by the middle of June. You will generally find the nest built on some ledge of rock, or under a bank near to some small stream, or in a stunted bush or under some heather; it is composed of dry grass daubed with mud and lined with finer grasses; and around the outside at times a few dried brackens, and a few twigs of heather. The number of eggs is five, and they are very similar

to those of the Blackbird, but a little larger, greener in the tint, and some of them more blotched, and the spots more decided, than on those of that bird.

The food of the Ring Ouzel consists of worms, small slugs, snails, and the berries of the Mountain Ash, Bilberry, etc. Even before incubation is over he often makes raids on the gardens on the lower foothills of the Pennine range. Some of my country friends can well testify that he regales himself on the cherries, raspberries, and other fruit, to their cost.

When nidification is over, the birds commence their southward march, they then are more noticed as they gather up by the way. They arrive in the south-eastern counties in the middle of September, and generally spend a week, hence they are called by the country people in those parts Michaelmas Blackbirds.

Another migrant who often builds near to the Ring Ouzel—in fact his next door neighbour—is

THE WHEATEAR, *Saxicola oenanthe*.

This bird is widely-spread over Central and Northern Europe, Greenland, Faroe Isles, eastwards across Siberia into Alaska, also in Sweden, Norway, Lapland, Egypt, and Asia Minor. They spend the winter in Africa, Persia, and India. My earliest dates of the arrival of the Wheatear are March 24th, 26th, 27th, and 29th. I first see them in our low-lying lands on the borders of our rivers, never many together, where they stay a day or two, and then make off to their breeding grounds up on our fell sides and along the coast line; only in one instance have I seen these birds in the breeding season between the shore and the foot-hills of the fells, and that was in a fallow field near to the Spa Well. This bird has a variety of local names, viz., Whiterump, Fallow-chat, Chacker, Charlie-mufti, Chickel, and several others. They run along the ground with great celerity, ever and anon stopping to have a look round, first on one side and then the other, flirting the tail, and showing the beautiful white parts of their plumage, then making a dart forward and picking up insects here and there, taking low slightly

undulating flights from one resting place to another, and always alighting on some little hillock, or a jutting stump; I have also seen them perch on rails. When the hen bird is sitting, the male is very solicitous of his charge, and will flit before you to try and lead you away, all the while uttering his call note, which I can only compare to the striking of two pebbles together. On the sandhills of our coast I have seen him feed the female on her nest, and also take her place for a short time, as if to allow her to exercise her feet and wings, and to take a little recreation.

During the breeding season the Wheatear has a sweet and varied little song, often poured forth on the wing, while hovering over his partner on the nest, during which his tail is alternately closed and spread open like a lady's fan. Once when crossing Glasson Moss on a fine spring morning, I noticed a male Wheatear in beautiful breeding plumage, sitting on a little mound of earth, and he was singing his love song beautifully. I was close to him, and tried to note down in my pocket book his varied notes, but I had to give it up; I could not find words to describe it. Although its song is not loud, there is something extremely pleasing in its softness; and it is all the more acceptable at this time, because the majority of our songsters, both resident and visitors, have not as yet commenced to pour forth their melody. In my walk that day I never saw a female, although males were fairly plentiful all along the littoral.

It is rather curious that in nearly all our summer visitors the males precede the females for some days. Birdcatchers are well aware of this fact; and all they catch in the first flight are sure to be males. Sometimes a week or so elapses before you see the females. What is the reason of this? Is it because the males are stronger, and brave the hardships of the journey better? Perhaps it may be that the initiative in all that relates to the continuance of the species devolves upon the male. This is a puzzling question, and one that will take some time before it is thoroughly explained, although I have no doubt that in the course of a few years there will be some satisfactory explanation given. The reports on migration are getting more complete every year, owing to the

increased number of observers in different parts of this and other countries.

Mr. Sweet gives a pleasing account of the Wheatear in confinement. He says it is a very interesting bird, and is almost continually singing; it will also sing by night as well as by day, if there be a light in the room where it is kept. It has a very pleasant, variable, and agreeable song, different from all other birds, which, in confinement, it continues all the winter. When a pair of them are kept together in an aviary, it is very amusing to see them at play with each other, flying up and down and spreading their wings in a curious manner, dancing and singing at the same time. I have very little doubt but a young bird brought up from the nest might be taught to talk, as they are very imitative.

About the first week in May the Wheatears have their full complement of eggs. They nest in the loose stone walls of our fells, under stones, sometimes under a piece of turf; and along the coast I have found them nesting in rabbit burrows; one I discovered in the railway yard at Silloth under some sleepers. The nest is composed of moss and dry grass, and lined with wool or hair, and in some instances with rabbit down; it is very loosely constructed. They lay five or six eggs of a pale light blue colour, and rather large for the size of the bird. The nest is difficult to find, although in nesting time when you see the birds they are not far off it.

The food of the Wheatear consists of small slugs, worms, insects, especially the Coleoptera; and I have also watched them through my binoculars, and seen them feeding on grasshoppers and spiders, and also catching insects flying in the air with the same address as the Flycatcher.

In the northern parts of Great Britain, this bird is the victim of superstition. Mudie says: "In the north the Wheatear is generally found on heaps of stones, by ruins, or on the dry stone walls of burial grounds; and though it is a very handsome bird, and in the early season sings sweetly, its haunts have gotten it a bad name. As I have said before, its common alarm note is very like chipping stones; and as it utters that note from the top of the heap which

haply covers the bones of one who perished by the storm, or his own hand; or from the mound beneath which there lie the slain of a battle field, magnified through the mist of years, or from the rude wall that fences in many generations;—it is no very unnatural stretch of the pondering fancy which dwells in such places, to associate the Wheatear with all the superstition that, unphilosophically, but not irreverently, belong to the place of graves. It comes onward, too, to meet the traveller, and now running, now flying, seems to pilot him to a place beside ‘the cairn,’ as if his own bones were soon to be gathered there; and in that, its note of solemn warning, it is more than usually energetic; so you are at perfect liberty to believe that it is breaking the stones that are to cover you—if you choose; and, really, there is no accounting for what people will believe in such places—or in any place. The Wheatear in the northern parts of Britain, and in places further to the north, is the victim of such superstition, old and young continue to kill and persecute the birds and to destroy their nests and eggs, considering the service as one of more than ordinary merit.”

In the first or second week of August, if you take a walk along any of our rivers, you are sure to see the Wheatear, although he has partially changed his dress, the upper parts in autumn being reddish brown, and the tail feathers tipped with white. I see them in parties of two or three, never more, all along the low-lying lands, or “bottoms,” as they are termed here, all making southward previous to their migration. Whether they follow the east or west coast I am unable to say. A little later on great numbers assemble upon the downs of our southern coast; and as they are then in first rate condition, and greatly esteemed as a delicacy for the table, they are captured in immense quantities by the shepherds who attend to the numerous flocks in those districts. Some idea of the havoc made among these birds during the months of August and September, may be obtained from the fact that, as many as eighty-four dozen have been taken by one shepherd in a day; and, according to Pennant, the number annually caught in the neighbourhood of Eastbourne, in Sussex, amounted to about 1840 dozen. The mode in which they are taken is singular from its simplicity;

a chamber is formed by cutting out an oblong piece of turf, which is then laid over the hole formed, in the opposite direction, so as to be supported by its ends ; and two passages are also cut in the turf leading into the chamber. Through these the birds run for shelter at the least alarm ; but in the middle of the chamber a small upright stick is placed supporting two running loops of horse hair, so arranged that it is almost impossible for a bird to run through the chamber without getting his neck into one of the nooses. It is said one shepherd, with the assistance of his lad, will attend from five to seven hundred of these snares. Mr. Johns states that it was formerly the custom for persons who wanted a dish of Wheatears to supply themselves from the traps, placing a penny in every hole from which they took a bird ; but of late years the influx of visitors to the neighbouring watering-places has so much enhanced their value, that the shepherds will allow no such interference. We once tried the experiment of releasing a bird and depositing the penny in the trap, when, from a neighbouring eminence we were assailed with such a torrent of abuse, that we declined repeating the experiment.

Instances have been recorded of this bird wintering in some of the south-eastern counties ; and Gilbert White mentions that he has seen a few stragglers at all times of the year, especially about warrens and stone quarries.

The next bird on my list is

THE NIGHTJAR, *Caprimulgus europæus*,

which occurs on the borders of our mosses and commons, especially those that are bordered with timber ; also the open glades of some of our woods, notably Barron Wood, the edge of High Stand, Orton, Newby Cross, the outskirts of the White Moss, Bowness and Wedholme Flows, and, nearer to hand, Rickerby ; some years ago a pair used to frequent Kingmoor, but I have not seen or heard them there these latter years.

The Nightjar is commonly distributed in summer through Great Britain and throughout Europe, ranging as far east as Central

Africa. As a rule it generally arrives in this locality in the middle of May; but the late T. C. Heysham records having seen one here in the middle of April. It breeds sparingly with us in this district, and rejoices in innumerable local names—in fact more than any other bird I know of. In some places it is known as the Goatsucker, from the ridiculous notion that it sucks goats and cows, and there are still in this county people who swear that they have seen it do so. No doubt cattle when lying down, especially near the outskirts of woods, disturb innumerable insects, and possibly they have seen the Nightjar hawking about the cattle, which lead them to think so. It is a preposterous name, as it is utterly impossible for the bird to do anything of the kind, owing to the construction of its beak. Other local names for this bird are Fern Owl, Fern Chafer, Goat Wheeler, Nightchurr Owl, Gnathawk, Mothcatcher, Wheelbird, Dorhawk, Evejar, Churn Owl, Puckeridge, and Nighthawk, which is its common name in Cumberland.

Anyone taking a country stroll in the sweet summer time, as the shades of evening are closing in, especially where these birds frequent, cannot but have been struck by their curious jarring note, which has been compared to that of an old fashioned spinning wheel; it is given uninterruptedly, a continuous vibratory jar, first in a higher pitch and then in a lower, and increases and diminishes in loudness. I have timed it by my watch to continue for a minute and a half without stopping. Mr. Bell says it is so like the croak of the Natterjack Toad, that he has more than once doubted from which of the two the sound proceeded. I am pretty well acquainted with the croak of this rare and handsome reptile, yet for my own part I can distinguish no similarity. The sound is also very deceptive: it appears to come first from one part of the tree, and then from another, and yet the bird was within a stone throw all the time. This seeming ventriloquism is caused simply by the bird turning its head in different directions;—the same applies to the Grasshopper Warbler and the Corncrake—I have noticed this in all three birds.

The Nightjar when perched is very difficult to see; its colour harmonises so well with the boughs, and he does not sit across the

branches, but lengthwise, one foot before the other, with his head down and tail up, apparently on the look out for moths and beetles flying about at the circumference of the tree. A pair I frequently watched in the summer of 1879, near to Rickerby, in still warm evenings commenced their churring note as regular as possible at five minutes past nine. I took my stand close to the trunk of the tree, and kept as quiet as possible. After the love song had gone on for some time, what I took to be the male commenced his swallow-like flight, and then his partner appeared; but I never could make out exactly where she came from. The pair used to fly in circles round the tree, sometimes to a good altitude, and then make a sudden descent to the grass; they toyed on a little while, at times making a sharp snapping sound, which I thought was made by striking their wings together over their back in playfulness, and then commenced to capture their prey. Their flight is as noiseless as the owl's, and they sometimes dashed close past me without the slightest noise. They appeared at times to make a complete somersault, as if they missed the insect they were after, as I noticed that in the twinkling of an eye they made a downright dash to the ground always after. It is a beautiful sight to watch this interesting and active bird in its varied flight, now and then wheeling in graceful curves, upwards and downwards, ever and anon suddenly reversing their wings and dashing backwards, picking up some passing beetle or moth, or chasing some insect it has missed on its way. They are birds very difficult to observe, as the twilight darkens in so soon, and does not leave you that time you would like to have to make correct observation.

The mouth of the Nightjar is enormously large, and shaded with a moustache composed of long and strong bristles, which, combined with the glutinous secretion with which the gape is lined, evidently assist in the capture of the large moths. There is another curious thing connected with this peculiar bird which has caused much discussion amongst naturalists as to its use, and that is the remarkable elongation of the claw of the middle toe, which has its inner margin deeply pectinated, or rather I should say, a comb-like process on it. Some say it is for the purpose of cleaning the

bristles round the mouth from the remains of its food, and also for removing vermin ; others maintain that it assists the bird in its peculiar way of perching. In that charming work, *The Natural History of Selborne*, Gilbert White mentions having "seen the Night-hawk put out its short leg when on the wing, and by a bend of the head, deliver something into its mouth. If it takes any part of its prey with its foot—as I have now the greatest reason to suppose it does—I no longer wonder at the use of its middle toe, which is curiously furnished with a serrated claw." Yarrell also quotes an instance of its doing so. This action of the bird has never come under my observation, although I have seen the Great Tit capture bees in the same manner. I should not like to give an opinion on the use of this peculiar toe : it can only be solved by patient and careful observation. I am only sorry that my position prevents me from devoting more time to the elucidation of this point. The time is so short between twilight and dark, that it would require one to live on the spot and watch for favourable opportunities.

Mr. Weir, a well known observer, relates a striking fact about this bird, he says:—"About half-past nine one evening, in the month of July, while I was walking through a large plantation of oak, a pair of Nightjars flew again and again around me, and within a few yards of my head. I shot the male. At eleven o'clock, as I had just arrived at the door of my house, an acquaintance who was passing by enquired of me what kind of bird I had in my hand. After telling him its name, he said he was anxious to examine it. I lighted a candle, and upon opening its mouth he started, exclaiming that it was not yet dead. No wonder he thought so, for in its mouth there were no fewer than four large moths, three of which were still alive." As if in confirmation of this, an ornithological friend of mine who lives in Kent wrote me, that on the evening of the 18th June he shot a pair of Goatsuckers for the purpose of stuffing, which he proceeded to do the following evening. On skinning the first the crop contained eleven moths, some of whom were still alive; the crop of the other bird contained two cockchaffers and the remains of moths and small beetles.

In some seasons the cockchaffer beetle is very destructive,

especially in the southern counties of England ; in this district it is not so common : some years you will scarcely see one, in others they are tolerably numerous, but never in such numbers as to cause any great damage. I have had the insect brought to me many times by gardeners and others as something curious, to see if I could tell them its name. The Nightjar captures great numbers of these, and for this service alone ought to be protected. In my entomological days, whilst sugaring for insects in one of the beautiful ferny glades of Barron Wood, two Nightjars played sad havoc amongst the moths ; the time we were waiting for darkness to set in, they snapped them up as fast as they appeared flying down the glade. The weird and ghost-like flight of the birds, as they flew ever and anon in their zig-zaggy way up and down the ride, combined with the stillness of the woods, left a lasting impression on my youthful mind. I see them now in my mind's eye after the lapse of many years.

What strange unearthly sounds you hear in the depths of the woods at night, especially near the river side : the lap-lapping and murmuring of the water on the pebbles, the whistle of the otter, various cries of night birds, the "too-whooh" of the owl, the hum of night-flies, and the different noises caused by predatory animals on the lookout for their prey, and also the little sweetheartings that are always going on amongst them in those parts. The eye of the naturalist peers into places where other people would scarcely deign to look. The ear also requires to be practised as well as the eye, and night is the best time to train it ; for then you can put it to Nature's key-hole, as it were, and hear all her mysterious sounds, and make out what they mean. We have overheard a pair of Water Voles engage in a very gentle and affectionate whispering, if I may call it so, beneath the willows upon which we were standing. The old, old story was evidently being rehearsed under there ; but the occasional splashing of the cold water made their courting appear like very chilling business—still we all know it is not so. Even in the calmest nights of summer there is now and then a gentle moaning among the leaves in the woods, as if some restless spirit was wandering among the tree tops. A naturalist

has to be no coward; he hears strange noises and sees strange sights, sometimes unaccountable, although in the majority of instances where we have been puzzled we have always found them out, especially when entomologising. We could tell you some strange stories of our adventures in the woods at night, but they would scarcely come within the scope of this paper. Live not all these recollections in the mind! chasing away even care while we contemplate them, and throwing a soothing tranquillity over the soul—a pleasure which we remember, a delight which can never be forgotten, but can be recalled at any time, no matter how far removed from the scenes we may be—nay, can be seen in the dark whenever the inward eye of memory opens. By my own fireside I can traverse scores of miles of pleasant scenery, can call up a hundred landscapes of forest, hill, river, valley, and pastoral plain; of village and tree and stile; of winding highways and pleasant field-paths, sylvan dells, charming dales, and pretty brookside nooks. Even a life of toil is sweetened by the remembrance of scenes like these, for they are pleasures that pass not away, but are ever stepping unawares upon us, throwing sudden bursts of “sunshine upon the passing clouds,” and cheering us on our way.

To return from this digression. Gamekeepers as a rule have a great aversion to this bird, and shoot it down unmercifully; the name Nighthawk I suppose being sufficient to account for this. The structure of the bird, to any intelligent person, is quite plenty to show that it is utterly incapable of tearing to pieces any young game; a glance at its bill and feet will prove this, apart from the fact that at the time of night when the Nightjar is flying the young game chicks would be safely ensconced under the mother's wings. I once was walking with a keeper, not far from Carlisle, in the dusk of a glorious summer's evening along the outskirts of a wood, when a Nighthawk flew right before us, and in an instant he had the gun to his shoulder, and shot the poor bird before I had time to expostulate with him. When telling him what a shame it was to shoot such a useful and harmless bird, all the satisfaction I got I will tell you in his own vernacular. He said: “It hes t' biggest gob an' laalest neb of enny burd in Cummerlan', an' sooks gam' eggs.”

The Nightjar makes no nest, but simply lays its eggs in some slight hollow on the ground, generally amongst heath or ferns, or under the shelter of some small bush or tuft of heather. The female sits very close, and will allow you to approach within a few feet before it scrambles away in a low peculiar drowsy-like flight, something like an owl's in daylight. I have only found the nest twice in all my experience. The first I found by accident; and if it had not been the bright beautiful eyes of the bird I should have trampled upon it. The second was discovered in a similar manner. One was at High Stand Wood, and the other on the border of Dalston Hall Wood. They lay two eggs of an oval form, both ends alike; they are very pretty eggs to my eye, being beautifully marbled with bluish grey and yellowish brown on a white ground—and in the same clutch you will nearly always find one more blotched than the other. The greatest number of these birds I ever saw together hawking was six, and that was near to Black Moss Pool.

The plumage of the Nightjar is a nice combination of grey, brown and sepia beautifully blended, and shaded with rippling and waving lines. The male bird has a large oval spot of white on the inner web of the three first quill feathers, and at the end of the two outmost tail feathers. And here I must finish this sketch of the Nightjar—a most characteristic bird—by quoting the following beautiful lines from Bishop Mant:—

Why, when May is well nigh past,
Of Britain's summer birds the last
To reach our shores, in waving fern,
Or furze, beside some bosky bourn,
Hid from the piercing eye of day,
Their nestless eggs the Nightjar lay.
Then issuing forth in evening gloom,
With hiss, and buzz, and solemn hum,
As of the spinner's whirling wheel,
Unseen on noiseless wings they steal,
Smooth gliding through the unfanned air,
With open mouths, and bristling hair
Fringing that cavern wide, prepared
To clasp the beetle's mailed shard;
Or circling, chase, in easy ring,
The night-moth's soft and downy wing.

The poet Wordsworth also refers to this bird :—

The busy Dor-hawk chases the white moth
With burring note.

The burring Dor-hawk round and round is wheeling.
That solitary bird
Is all that can be heard,
In silence deeper far than deepest noon.

The following lines will form a fitting introduction to our next visitor—

THE LANDRAIL, OR CORNCRAKE, *Crex pratensis*.

But hark ! as by the cornfield's side,
Where the fresh blades aspiring hide
With wavy folds its furrow'd breast,
The ear what startling sounds arrest !
Perhaps you deem from fenny bog
You hear the croaking of the frog,
Monotonous, afar or nigh,
The same untun'd repeated cry.
Again the sound ! now here, now there,
It tempts to follow ; but howe'er
Your steps the fleeting cry pursue,
You'll scarce the cause retiring view ;
You'll scarce with foot or eye o'ertake
The dark form of the mottled crake,
As his long legs low-bending pass
Through the high corn or waving grass,
With body prone ; nor dares his wing
Up from the verdant covert spring.

The Corncrake generally arrives in this neighbourhood about the 23rd of April, although days sometimes elapse before you hear its welcome cry. It is a bird oftener heard than seen. On referring to my note books, I find in some years it is fairly plentiful, and in others only scarce ; how to account for this I cannot tell, except it may be the state of the weather, or the direction of the wind, which may be conducive to a more extended migration, and may

bring more birds into our northern counties. But in those years when it visits us freely, I notice that it prognosticates a wet season. They love to frequent the rich meadows along our river sides, marshy bottoms, corn fields, or where there is a thick under-cover of vegetation. In the calm soft evenings about the latter end of spring, you will hear them calling their "crake-crake, crake-crake," but not unmusical cry—at least to my ear. I have reason to suppose that the females do not arrive till some considerable time after the males, for numbers that are shot about this time all turn out to be males. These birds shift about a good deal after their arrival: you will hear them calling one evening in one field, and the next some considerable way off, as if looking for their lady loves. Their cry is very deceiving—first sounding at one end of the meadow, then at the other; sometimes at one place in the middle of the field, and the next moment directly opposite. I was first led to suppose that the bird was running in different directions—and a fast runner it undoubtedly is—but such a short time elapsed between the calls, and the distances were so great, that I had my doubts on the matter; then I surmised that the Corncrake possessed a sort of ventriloquism. But, however, one evening, through a hole in a hedge, I had a good view of one in the act of calling, and I observed that it thrust its neck out and in, and kept turning its head in various directions, which made the sound appear to come from the different quarters.

I have often called these birds up to where I was snugly ensconced, for the purpose of close observation, and whenever there was a good cover I never failed; but you have to keep very quiet, as the Corncrake is very quick at both seeing and hearing, and if it gets the least glimpse of you, or hears the slightest sound—the breaking of a twig, or a rustle in the grass for instance—it puts its head to the ground and disappears like magic through the undergrowth. The form of the bird is well adapted for this rapid gliding betwixt the thickest grass or the closest sown corn, with its snake-like head, and breast formed like the bow of a fast-sailing ship. When uttering its cry it usually stands still, and apparently with its neck thrust out and again contracted, and twisting it

rapidly from side to side as the craking is being produced. But I have also seen it call whilst walking, which it does very demurely, lifting its feet high, and bending its head and tail in rather a comical fashion; its strut reminds me very much of the precise and prim walk which the waterhen assumes at times. Often when returning from angling, in the grey dawn of the morning, have I heard their "crake-crake, crake-crake," resounding in the meadows I was passing through, intermingling with the matin hymns of our early rising songsters. It also cries in the still hours of the night; but the familiar call ceases after the period of incubation.

I have known the Corncrake, more than once, cut in two by the mowers. The bird squats so low in the grass, and remains so still, that its whereabouts was not discovered until the sharp scythe had stopped its cry for ever. There is not the least doubt that numbers of this bird are destroyed every year, especially since the introduction of the mowing machine, which cuts the grass so close, and just at the time the birds are sitting; it is a miracle that there are any left at all. When hay-cutting was principally done by hand, instances have come to my knowledge where the mowers, having got a glimpse of the bird on her nest, left a small portion uncut around where the bird was sitting, so as to allow her to hatch out the chicks. The young run as soon as hatched, and the little black downy fellows are a very pretty sight. An instance of the parental instinct of these birds, I cannot help but record. A few years ago, on the 30th of June, whilst some mowers were cutting a field of grass, they inadvertently cut through the nest of a Corncrake, the young of which had only just broken through the shell. Three young birds were found to be killed by the scythe; several others were seen to run away and hide themselves in the long grass. A minute or two after, as the men were re-commencing work, one of the parent birds was seen to rush out towards the nest, and rapidly retreat with something black in its beak towards the high grass on a bank not many feet distant. The curiosity of the men being roused, they immediately searched the place where the old bird was lost to view, and, to their surprise, found one of the young without feet, both having been cut off by the scythe,

and in consequence it was quite unable to run a step. This the old bird having discovered, conveyed it to a place of safety by its beak.

You can scarcely get Corncrakes to take wing; when they do so, they fly heavily, with their legs hanging down, and generally drop over the nearest hedge, although at times I have seen them take pretty long flights; one in the Rose Holms, which we flushed out of a new mown field, in which the hay was piked, and the bird feeding on insects among the aftermath, and where there was no cover, took wing, and we watched it till lost to our view.

When the hay is cleared off the meadows, the birds betake themselves into the turnip and clover fields, which afford them abundance of food and shelter. The food of the Landrail consists of small snails, slugs, worms, beetles, insects, and also the seeds of grasses.

The Corncrake builds its nest in the thick grass, sometimes in a hedge bottom where there is a dense undergrowth; it is not a very elaborate affair, consisting of dried grass, and lined with a few finer grasses; it lays from eight to twelve eggs. I once knew one with sixteen; but perhaps this number may have been the joint production of a pair of birds. The eggs are very pretty ones, pale yellowish in ground colour, spotted and blotched with brownish red, ashy grey, and purple. The richest marked specimens I ever saw, were taken by a friend of mine in the neighbourhood of Dalston. By his description I made sure they were the eggs of the Quail, a bird which breeds sporadically in this district; but on inspection they were decidedly those of the Landrail.

The Corncrake is very highly prized for food; I know by experience it makes a dainty dish; and there is an old saying in the country, that a brace of these birds is a present for a queen.

This bird, when exposed to danger from which it cannot escape, will simulate death. Mr. Jesse relates the following incident in proof of this assertion: "A gentleman had a Corncrake brought to him by his dog, to all appearance quite dead. As it lay on the ground, he turned it over with his foot, and felt convinced that it was dead; standing by, however, in silence, he suddenly saw it

open one eye. He then took it up ; its head fell, its legs hung loose, and it appeared again quite dead. He then put it in his pocket, and before long he felt it all alive, and struggling to escape. He took it out, and it was lifeless as before. Having laid it again upon the ground, and retired to some distance, the bird in about five minutes warily raised its head, looked round, and decamped at full speed."

There is no doubt some of these birds remain to winter with us, as I have known birds shot at Christmas time, but in a very emaciated condition ; probably wounded birds in the autumn. Numbers have been known to remain in Ireland all the year through.

I cannot close this account of our Summer Visitors without mentioning another favourite bird of mine—

THE COMMON SANDPIPER, *Totanus hypoleucus*.

Known to country people as the Summer Snipe ; the "Willy Wicket" of our boyhood. It generally arrives here about April 20th, invariably in pairs. This is the only summer migrant, during the whole course of my observation, which does so, at least in this district ; possibly they may pair on the coast line before making up to their breeding haunts. This pretty little wader is fairly numerous on all our rivers, and some of their tributaries. You will find it breeding from the Esk, where it empties into the Solway, right up into the heart of the fells. I have found it nesting on the following rivers—Esk, Eden, Lyne, Irthing, Caldew, Petterill, Croglin, Ive, Roe, in the upper and the lower reaches of the Gelt, and also in many of our fell becks.

I love to see this Sandpiper flying about our rivers in its somewhat rapid and tortuous flight, just skimming the surface of the water with its beautiful arched wings, now and then sailing in the air without moving those organs, then a stroke or two and away again to some retired part, where they alight with their wings held up above their back, and go some little distance in this

manner before closing them. They run with alacrity along the gravel, or paddle in the shallows looking for food, or run quickly along the sand beds, leaving their pretty footprints on the wet sand. You may at times come suddenly upon them round the bends of the river—but as a rule they are very alert—and startle them, when they fly up the stream uttering their sweet refrain, “willy wicket, willy wicket.” In the early part of the breeding season, the grotesque antics of the male bird whilst dancing in attendance around the female, has often caused me to burst into uncontrollable fits of laughter.

They enliven the river sides and borders of our lakes, and as they are active in all their movements, whether on foot or on the wing, with their pretty plumage and dapper form, they are sure to attract the eye of the wanderer in those parts. In my angling days, many times I neglected filling my creel, by my attention being more devoted to the merry gambols of this bird, and other birds which are to be found in the same localities. The many curious insects, the beautiful flowers, the calm tranquil scenes, and the many strange objects which come across the angler’s eye whilst standing silently in the river side solitudes, these are quite sufficient to spoil the day’s fishing.

You need not go far from this city to see the Summer Snipe ; you will always find a few pairs down by Stainton Banks, Grinsdale Island, and Rickerby, where I have often found them breeding. I have never myself noticed this bird perch, but there is a pretty description of its doing so in *The Birds of Cumberland*. I have observed it running along the stone walls by the side of the river, and also along the trunk of a fallen tree. The bird breeds in the middle of May, and makes a pretty, although not elaborate, nest. I have seen the nest on the shingle, with just a little dried grass on the inside, on the N.W. point of Rockcliffe Marsh, just outside the tide mark, where, in a full tide, it would have been carried away. It often happens that the water sweeps over nearly the whole of the ground, and numbers of nests and eggs of different birds are destroyed. We have seen them lying in scores, where the tide had swept them from the breeding grounds

on the marsh. I have also found the nest on the bank side, and I observe that it forms a better nest when built in this situation. Sometimes it builds a considerable distance from the river; I have known them between eighty and a hundred yards from it. At times you will find it on the sand beds, built under the shade of the large leaves of the butter bur, or under the shelter of some small bush. The nest is generally in a slight depression of the ground, although sometimes the hole is scratched by the birds themselves; it is built sparingly of dried grass, fibrous roots, and sometimes a few leaves. The number of eggs are four, of a lightish cream colour spotted and blotched with dark reddish brown and ashy grey. The eggs laid in nests found on the shingle are profusely marked with small spots of a reddish colour, and are not so deeply marked as those found on the bank sides; they assimilate very much with the surroundings, and it takes a practised eye to find the nest. The eggs are very large for the size of the bird, and are arranged quatrefoil; they take up very little room, and you would wonder how the small nest could contain them. The prettiest nest I ever saw, was on an island in the river Caldew, built on a small hillock of sand, covered with wild thyme; the nest was in a cup-like hollow on the very top—a beautiful sight. When the bird went off the nest, it ran down the mound, and at the first glimpse I thought it was a young wild rabbit, as there were a few on the island. I have found the nest close to footpaths on several occasions, notably one at Wetheral, where people were constantly passing within a foot or two of it; in fact I should never have thought of looking for it in such a public place; but in the twilight of a beautiful summer night I saw the bird run off, and I looked more through curiosity than anything else, and sure enough there the nest was, hidden under a small bush; yet, in spite of this, the bird hatched out the young safely. When incubation is going on, the male takes his place on the nest for a time; this I have seen several times by the aid of my field-glass. He is never far away when hatching is going on, and is the first to give the alarm with his querulous note.

The young run about as soon as they are out of the shell—and

pretty downy little fellows they are. If you should happen to come near them, the old birds give a plaintive complaining note of "weet, weet," and a sort of soft subdued whistle, and the young birds scuttle under cover as quick as possible. They are adepts at hiding, and if you take your eyes off them for an instant, it will take you all your time to catch sight of them again; and at the same time the parent birds are using all the wiles that Nature has given them to decoy you away—tumbling about as if their wings were broken, just keeping out of your reach—and when they allure you sufficiently far from the spot, they wheel right back to where the chicks are hiding. The parent birds are very assiduous in the care of their young, and when they take wing, the old ones lead the van to some sheltered place, all the while uttering their sweet ringing cry of "willy wicket, willy wicket." The family keep together all the summer through, and it is a pretty sight to see them feeding in some sequestered place.

Although this bird breeds so close to Carlisle, some of the species in the same family breed in high northern latitudes. The eggs of the Sanderling were first found during the late Arctic Expedition; and the eggs of the Knot Sandpiper, a common winter visitor here, are as yet unknown to science: the eggs have never been found, although the young were seen during the late Expedition under Sir George Nares, in the highest known latitude where bird life existed. In autumn, numerous family parties from the upper reaches of the rivers make down to the marshes, where they stay a short while previous to migrating to their winter home in the "sunny south."

Whilst sketching these notes on our Summer Visitors, what pleasant reminiscences have been brought to my memory, of happy days and hours spent among our fells, mosses, moors, marshes, hedgerows, and woods. The study of Natural History is an unalloyed pleasure; and only those know the happiness it brings who have opened the pages of the great book of Nature. It operates on our kindly feelings, and in many instances opens the communication to the most pleasing acquaintances, which from congeniality of disposition ripen into the warmest friendships.

There is a peculiar interest attached to the study of Natural History, even when pursued as a mere recreation, or without any view of benefiting others by our observations. It throws a charm on a country walk at any period of the year, or even on a simple turn in the garden ; it excites habits of quick observation in the youthful mind, and expands the heart in more mature life.

Nature's voice is sweet
Wherever heard ; her works, wherever seen,
Are might and beauty ; to the mind and eye
She speaks of things that but with life can die.

ICE WORK IN EDENSIDE
AND SOME OF THE ADJOINING PARTS OF
NORTH WESTERN ENGLAND.

By J. G. GOODCHILD, F.G.S.,

OF THE GEOLOGICAL SURVEY OF ENGLAND AND WALES.

[The following paper gives a connected summary of several lectures and addresses given before the local scientific societies of Cumberland and Westmorland between the years 1880 and 1887.]

- I. INTRODUCTION.
- II. RELATING TO ICE AND GLACIATION.
- III. THE ORIGIN OF OUR DRIFT DEPOSITS.
- IV. THE RESULTS OF ICE ACTION UPON THE SURFACE.
- V. POSTGLACIAL DENUDATION.

I. *Introduction.*—In the *Quarterly Journal of the Geological Society*, xxxi, pp. 55-99, was published a paper, read in June, 1874, on the “Glacial Phenomena of the Eden Valley and the Yorkshire Dale-District.” This gave a condensed account of the principal facts and arguments relating to the results of ice work during the Glacial Period over the area referred to in the title, based partly upon work done in connection with the Geological Survey prior to the date mentioned. Besides discussing matters whose chief interest was more or less of a local character, the paper treated of several matters of more general interest to geologists; such as the behaviour of large masses of land ice in motion, the origin of the various and highly-complex drift deposits of the north-west of

England, the nature and extent of the erosion accomplished by the ice during its stay in the North of England, and the amount of denudation that had been brought about through the action of various causes since the close of the Glacial Period. Within a few months of the publication of the article referred to the same subjects were discussed anew in the pages of the *Geological Magazine* (Dec. ii, vols. 1 and 2). In these latter articles the chief arguments were repeated in a somewhat different form, but without any substantial alteration as regards the main points of the original.

In the papers referred to several of the theories enunciated were new, and were, in some respects, so different from the views then generally accepted, that considerable reluctance to consider them at all was manifested by the older geologists, especially by those whose views on these subjects had been already committed to print, or had otherwise been made public. Perhaps for this reason, and because the acceptance of the new views involved the entire abandonment of some of the views then current upon the sequence of events during the Glacial Period, as well as upon the important question of the antiquity of man, geologists in general seem to have come, about that time, to regard some of the questions involved as beyond solution, with the knowledge then available.

By degrees, however, as our knowledge of matters pertaining to the geological action of ice has extended, the older views I have referred to have been, to a certain extent, abandoned, especially by those geologists whose views remain unfettered; and the place of the older views has been taken by others differing only in minor matters of detail from those put forward in the papers mentioned above.

Under these circumstances I have thought it might be convenient to bring together into one article the main facts and arguments already stated, as little as possible encumbered by local details, and to reinforce these here and there with additional matter since made public by the labours of other workers in the same field of study. In substance, therefore, the following paper contains a re-statement of the views put forward by myself in 1874. And in

discussing the subject I propose to confine my attention to that part of the area treated of in the paper in the *Quarterly Journal* under the name of the Eden Valley, (or, as it would be more convenient to designate it, Edenside,) and except in special cases to confine my observations rather to generalities than to local details, which I must leave the reader to gather for himself from the map appended to this article, or from the statements given in the paper just mentioned.

II. *Relating to Ice and Glaciation.*

Physical Characters of Edenside.

Its Geological Structure.

General Relation of the Glacial Geology of Edenside to that of East Anglia.

Preglacial Configuration of the Surface.

The Precursors of the Ice Sheet, and the Earlier Periods of Glaciation.

Southward Advance of Scottish Ice.

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Relative Date of the Maximum Glaciation.

Latest Glaciers of local origin.

Abrupt Termination of the Period of Maximum Glaciation.

Physical Characters of Edenside.—The district herein more specially referred to is that part of Cumberland and Westmorland lying between the northern slopes of the Lake District and its eastward continuation, the Howgill Fells, on the one hand, and the main line of watershed ranging along the summit of the Cross Fell Escarpment on the other. This area coincides, in great part, with the lower two-thirds of the basin of the Eden, but to speak of it as

the Eden *Valley* is a decided misnomer. Viewed broadly, and without regard to the minor inequalities of the surface, the part under notice appears as an irregular plain inclined in a north-easterly direction, and falling from an elevation of 1500 to 2000 feet (that of the east and west physical axis of the Lake District,) to a general level of between five and six hundred feet above the sea near the foot of the Escarpment. This inclined plain terminates rather abruptly at both its south-eastern and its north-eastern margins against the steep edge of the great upland tract of Carboniferous rocks that forms the Cross Fell Escarpment, and its continuation from Brough southward past Kirkby Stephen. The bounding edges referred to as forming the termination of the plain range in elevation from about fifteen hundred to between two- and three thousand feet above the level of the sea. In plan, the area thus enclosed is rudely triangular in form, with the apex of the triangle directed towards the south-east. At the opposite, or north-western, end, the depressed area under notice gradually merges into the low ground of the Solway, nearly opposite Criffel. From the Solway to the inland termination of the plain is about sixty miles. Kirkby Stephen, Appleby, Penrith, and Carlisle, are all situated upon the plain referred to. A comparatively-slight and shallow depression in the mountain framework bordering the south-eastern termination of the lowland area bears the name of Stainmoor. This Stainmoor depression is continued away from the plain at its foot eastward for many miles, ranging between the high lands of Upper Teesdale, etc., on the north, and the fells on the north side of Swaledale, Arkendale Head, etc., on the south. In another direction, between the Howgill Fells and the *massif* of the Lake District, a second wide and shallow depression ranges southward along the general course of the Lune valley, and, as it were, connects the lowlands north of the Lake District with those of the Kendal area. On the western side of this depression lies the outcrop of the well-known Shap Granite.

Geological Structure.—The greater part of the lowland tract consists of—(1) The Upper New Red, consisting of the Stanwix

Marls, St. Bees Sandstone, and Lower Gypseous Shales; (2) The Magnesian Limestone and the Plant Beds; (3) Lower New Red, which includes the Penrith Sandstone and its associates the Brockrams. These latter rocks furnish evidence of much value in connection with the movements of the ice. (4) Lower Carboniferous rocks, characterised here by its stained sandstones and shales, and by its dolomitized limestone; (5) Precarboniferous rocks of various kinds. The marginal uplands consist on the north-east and the east mainly of Carboniferous rocks of the same age as those of the lowlands. The Carboniferous rocks of the uplands are not, however, stained and altered as are those just referred to. With these Carboniferous rocks occur a few rocks of older date, including some few plutonic and volcanic rocks of well marked characters, such as the Gabbro of Cuns Fell, and the "granite" of Dufton. The south-west uplands consist mainly of older palæozoic rocks of various kinds, many of them of strongly-marked characters, and easily recognized even in the form of small fragments. Amongst these rocks special mention is made of—(1) Shap Granite, and the metamorphic rocks around it; (2) Mardale Gabbro; (3) St. John's Quartz Felsite and the Armboth Dyke; (4) Sale Fell Minette; (5) Buttermere Syenite.

To these mention may be added of the granites of Criffel, as well as the various rocks therewith associated in Galloway.

Each of these rocks named has characters so well marked and distinctive that boulders of it can be traced in the drift without much possibility of error such as might arise through incorrect identification. They consequently afford ready means of determining the general, or predominating, direction of boulder-transportal from each of the areas that they respectively represent, and as such their distribution has been specially considered in the remarks that follow.

General Relation of Glacial Geology of Edenside to that of East Anglia.—In commencing to deal with the glacial history of this area we find ourselves confronted by considerable difficulties at the very outset of the enquiry. In some other parts of England,

especially in Norfolk and the maritime districts there adjoining, a nearly-complete record of the sequence of events from late Pliocene times downward have been preserved, and we can, in consequence, get more-or-less complete materials relating to the whole Pleistocene history of that part of the kingdom. In the hands of my colleagues, Mr. Clement Reid and Mr. E. T. Newton, these materials have been carefully worked up, and have been made to yield a connected account of the whole series of events from the advent of cold condition in Pliocene times onward.* In the North-West of England the case is very different; for our materials, except those relating to the very latest period of the Age of Ice, are either very imperfect and fragmentary, or are else wanting altogether.

Preglacial Configuration of the Surface.—Turning first to the preglacial features of the surface, we find that in regard to the minor details of surface sculpture, nothing very certain can be made out. There are however many reasons for believing that these minor features were different in many essential respects from those that meet the eye there now. And in the dales of Yorkshire adjoining the eastern parts of Edenside it is certain that the form of the surface left by prolonged weathering, such as must have preceded the Glacial Period, must have been very different from what we see there now. And what is true of the Yorkshire Dales must be true *ceteris paribus*, of the parts herein more especially under notice. All the larger features, however, appear to have been shaped out long before the advent of the Glacial Period. Where there are valleys and hills now, there were valleys and hills as far back as the times when the oldest Pleistocene deposits of East Anglia were laid down.

It seems to be perfectly clear, indeed, that not only all the larger valleys, but also most of the courses of the smaller streams, had already been carved into much their present form by the prolonged action of subaërial denudation, prior to the advent of the Glacial Period proper. There seems also every reason to

* See the Geological Survey Memoir on the Geology of Cromer.

believe that the advent of the Glacial Period found the rock surfaces over a large part of this area as deeply buried beneath a covering of their own material, weathered and disintegrated *in situ*, as are any of the rock surfaces at the present day where subaërial waste has gone on without interruption from preglacial times. To appreciate the significance of this, we have but to compare the character of the surface rocks of granitic areas in highly-glaciated districts, as, for example, at Shap, with rocks in similar positions that have not been swept clean by an invasion of land ice, as in the case of the Cornish granites. The bare masses of hard and solid rock at the surface in the granite areas of the northern parts of the kingdom contrast strongly in this respect with the deeply-weathered rock, and its accompanying thick superficial mass of china clay, resulting from prolonged disintegration, that are associated with the granites of Cornwall, and other nonglaciated areas. Or, again, we may compare the surface of the Chalk of Yorkshire with that seen upon the North Downs, where thick deposits of Clay-with-flints have gone on accumulating for long ages, almost undisturbed by land ice, and thus bear forcible witness equally to the continuous subaërial waste of the rock from a period long anterior to the Glacial Epoch. (Geol. Mag. 1875, p. 360, and Pro. Geol. Assoc. ix., No. 3.)

The Precursors of the Ice Sheet, and the earlier periods of Glaciation.—It is not possible to do more than hazard a conjecture regarding the precise sequence of events that led up to that succession of periods of extreme cold that together characterized what we call the Glacial Period. It is possible that, from early Pleistocene times—or even from late Pliocene, as we know was the case in East Anglia—periods of greater cold, alternating with more temperate conditions, may have nourished glaciers in all the mountainous districts of the North. And it is not unlikely that these precursors of the great Ice Sheet may, time after time, have pushed their respective moraines out far beyond the mountain regions themselves. Or they may even, under climatal conditions of excessive rigour, have extended as far as the sea, especially in the

case of the maritime elevations of West Cumberland. But even when they attained to very large dimensions, and perhaps for a long time after the increasing severity of the cold had led to the confluence of many of the larger streams that reached the low grounds, there is still every reason to believe that their movements were on the whole downhill and seaward, and everywhere radial to the main centres of high land. If this epoch of repeated arctic conditions was one of very long duration (? 200,000 years) as there seems many good reasons for believing was the case, it will enable us to account easily for many of the more striking results of glacial action, our lake-basins for example, and especially for the origin of those remarkable parallel rock-furrows and grooves (many of them almost entitled to be termed valleys) that are ploughed out of the solid rock here and there over large areas in the north. These parallel furrows, many of them fifty feet or more in depth, hundreds of yards in width, and sometimes a quarter of a mile or more in length, run side by side over a large area around Appleby and Penrith, where their form has long attracted attention, without hitherto meeting with a satisfactory explanation. Many of the hill shaded maps of the Ordnance Survey shew these features remarkably well. They are, I believe, simply deep glacial grooves ploughed out of the solid rock by prolonged erosion, accomplished by the ice in the earlier periods of glacial action, when the local ice moved as a mass of confluent glaciers outward from the Lake District toward the sea. Their direction is quite different from the course taken by the ice during the comparatively-short period of maximum glaciation presently to be referred to.

It was at this earlier period, I believe, that vast quantities of the Lake Country and of the Edenside rocks, disintegrated and loosened by prolonged weathering in late Pliocene times, were swept by the same seaward-flowing ice out into the low ground of Edenside, and left, may be in the form of vast moraines, in the maritime districts near where is now Carlisle. Along with these tough and durable rocks must also have been transported the *debris* of such rocks as the Skidda Slate, and the like, in quantities proportionate to the areas then exposed directly to glacial action. But these, except in

rare instances, have not survived the events that followed. Whatever happened, I feel certain that it was during this earlier period of large confluent glaciers that most of the preglacially-weathered rock material was detached from the parent masses and transported downhill and seawards by the ice. And it is but another way of stating the same fact to observe that it must have been during this prolonged period of intense local glaciation, and not at the actual climax of the Glacial Period, that the largest amount of local glaciation was effected. The main direction of the great glacial furrows above mentioned is often nearly at right angles to the line of movement of the ice when at its maximum of development. This is clearly shewn by the striæ, which, necessarily, mark the direction of the very last movement of the sole of the ice at that particular spot. In the Yorkshire Dales, and in the great mountain mass lying between the Cross Fell Escarpment and the Tyne Valley the prevailing movements of the chief masses of ice seem to have been, all through, mainly downhill and seaward. And that was the case even when the rigour of the climate had increased to such an extent that the surface formed by the confluent glaciers of those parts had risen to the highest level of the mountain tops.

Southward Advance of the Scottish Ice.—But in some areas adjoining the uplands just mentioned another factor came into action at a late period in the glacial history of the North, and altered the sequence of events very materially. Preglacially-weathered detritus had been swept outwards and seawards from the mountain areas around the Solway, probably in large quantities, and much of this, as the icy flood swept southwards with increasing force, may have been thrust outwards from the Solway into the Irish Sea. But with the further advance of the ice, came a time when the Scottish glaciers from north of the Solway began to join ends with those extending northwards and north-westwards from Cumberland. Then, as the outflow by way of the North Channel became dammed up by the south-easterly advance of the Great Northern Barrier, (whose upper surface must have been at least 2600 feet above sea level,) the only lines of movement open to the

Solway glaciers lay in the direction of the Irish Sea on the one hand, and on the other, eastwards across the lowlands bordering the upper parts of the Solway, over the Bewcastle Fells and into the Tyne Valley, and, yet again, up the lowlands of Edenside in the direction of Penrith, Appleby, and Stainmoor. So that at the climax of the Glacial Period the movements of the several ice streams flowing into the Solway were first arrested, and then were turned into directions different from any they had taken before—in some cases in directions diametrically opposite to those they would have taken had the Great Northern Barrier not advanced as far southwards as the Scottish coasts. The evidence seems to favour the view that it was mainly the upper currents of the flowing sea of ice that were turned inland in this way: the lower strata—more influenced by local causes than the ice at higher levels—may, all through the Glacial Period, have flowed more or less in the usual directions, where those directions happened to coincide with the lines of least resistance under the various directions of pressure. In the original papers I have referred to, evidence was given to shew that the upper surface of the inland ice in the northern parts of Westmorland and Cumberland rose to an elevation of over 2400 feet above the level of the sea: perhaps it would be within the mark to say that it rose to a level of over 2600 feet. It must therefore be obvious that the upper limit of the dam that ponded back the ice about the Solway and compelled its upper currents to flow inland must have exceeded even that great thickness. And here I would remark that the above observations relating to the Great Northern Barrier of ice are not intended to suggest that the ice of every part of that barrier emanated from Polar regions. I do not, and never did, believe in the southward march of a great sheet of ice over everything in its way. But I do believe that the outward flow of most of the ice originating in the north-western parts of the kingdom was impeded, or else turned in southerly directions by ice filling up the North Atlantic; and that the local ice so turned southwards acted in its turn as a northern, or north-western, barrier upon other local streams further south still, and so on, southward to the line where the southward

flow was balanced by the melting of the ice, as it seems to have been, at the climax of the Glacial Period, on the north bank of the Thames Valley. The ice that, advancing south-eastward by the North Channel, dammed back the Solway ice, probably originated, as ice, no farther north than the northern parts of Kirkcudbright, and was not part of a polar ice cap, as this is commonly understood; although its south-easterly movement may be attributed to some such cause.

Inland and uphill march of the Ice.—To repeat what was stated above :—When the north-western barrier ice changed the direction of movement of the Solway ice stream, much of the Solway ice, having no other means of exit open to it, was compelled to flow eastwards over the Bewcastle Fells, along the Tyne Valley, and thence still eastward to the point where the influence of the Scandinavian ice turned the stream again southward. Thus it was that, on the melting of the ice detritus originally derived from all parts of the basin of the Solway, including much that was transported to the low ground about Carlisle from the country around Penrith—amongst other well known rocks, boulders of Shap Granite—was left in the form of drift around Newcastle and extending thence southward through Durham, and out to sea by way of the east side of the Cleveland hills.

Another stream of ice, already referred to, was diverted inland and uphill from Carlisle past Penrith and Appleby by the action of the same barrier that turned the current first mentioned up the Bewcastle Fells. This, which I shall call the Edenside stream, became more and more constrained under the lateral pressure of local ice emanating on the one hand from the north sides of the Lake District, and on the other from the Cross Fell Escarpment, as it was forced eastward. At the head of Edenside it was met by heavy streams of local ice emanating from the uplands south and south-east of Kirkby Stephen, and under the influence of these masses the Edenside stream was diverted from its prevailing south-easterly course, and forced into a more northerly direction across the eastern end of the Cross Fell Escarpment above Brough

(Stainmoor) and thence eastward, hemmed in on each side by ice-streams from the uplands of Teesdale on the one hand, and of Swaledale and Arkendale on the other, by way of Barnard Castle and Darlington to the Vale of York. Here it joined, and reinforced, part of the stream that had travelled round by the Tyne Valley and Durham, and, like that stream, was turned southwards by the influence of the Scandinavian ice, and forced in a gradually-diminishing mass still southwards, through Yorkshire into Lincolnshire and Nottinghamshire. Traces of an advance even further south than that are said to have been made out.

While the Edenside stream itself was moving inland and uphill either as a whole, or on one horizon or other in its vertical extent, the local ice still continued to move outwards from the larger masses of high land. This fact was shewn clearly enough in the paper published in the *Quarterly Journal*, above cited. But in many places the directions of movement were, as might be expected, considerably modified by the influence of outside causes. And this modification proceeded so far in some places as to turn the higher currents of ice into directions very different from those taken by the ice at a lower level. To this point I shall return presently. But one result of such action was that the higher currents of the great mass of confluent glaciers around Shap (where I have already pointed out that a wide depression of the physical axis of the Lake District hills occurs) overflowed in the direction of least resistance there, and streamed away from the north side of the Lake District along a gradually-widening zone parallel to the Lune Valley, past Kendal, Kirkby Lonsdale, and Lancaster to the low grounds beyond. With this southward overflow went large quantities of Edenside rocks, notably large numbers of boulders of Shap Granite.

West Cumberland Dispersion.—Much of the ice of West Cumberland, south of a point near Cockermouth, appears to have gone southward under all circumstances. The main thrust of the Scottish ice was diametrically opposite that of the ice from the English hills somewhere to the north of that town. And it seems

almost certain that a line of ice-shed extended from thereabouts across the Solway into Kirkcudbright: the ice to the north-east of that line moving mainly north-eastward and eastward, while to the south-west it moved parallel to the general trend of the English coast, along a course determined by the line of least resistance between the local ice pressing seaward from the Lake District, and the extraneous ice constantly tending to move inland, in a south-easterly direction. Under the influence of this stream vast quantities of detritus from the Lake District, as well as from Galloway, was transported in a south-south-easterly direction—always tending to press inland—past Liverpool and Manchester, and on to the coast of North Wales. Here the northern stream seems to have been diverted into two branches, probably, as Mr. Strahan has shewn, by the outward-pressing masses of ice from the Welsh hills. One of these branches went inland, and seems to have gone over the low ground south of Chester, spreading out to the east certainly as far as Stafford, where I have found an abundance of recognizable detritus derived from Galloway and West Cumberland. The map appended may serve to make these complex movements more intelligible. (*See the map at the end of this article.*)

Glacial Distribution of Boulders.—In dealing with the causes that have led to the distribution of boulders in the position they naturally occupy at the present day, many difficulties are met with. Some of these may conveniently be discussed here. One of the most important points to bear in mind in discussing this part of the subject is that the initial direction of transportal of many boulders, as well as their movements in later times, may often have been very different from what they were during the last movements of the ice, which, of course, were usually the movements that left the boulders in the position they now occupy. The distribution of Shap Granite boulders well exemplifies this. These may have been moved, first, by purely local glaciers, say down the valley of the Lowther; secondly, under a more extensive and prolonged system of glaciation when the whole of Edenside was filled with ice moving toward the Solway, they may have been left in terminal

moraines on the plains around Carlisle; thirdly, when the climax of the Glacial Period arrived and the great north-western barrier prevented egress by the Solway, the movements of the ice were first arrested, and were subsequently turned into directions entirely different from any they had taken before. Some were swept in the ice from Carlisle towards Newcastle; others again were driven back from Carlisle past their older sites once more, and thence towards Stainmoor and the Vale of York; others again past West Cumberland into South Lancashire. Or, yet again, from Shap Fell itself, under the influence of the same dam, a narrow stream gradually widening as it went southwards, overflowed from the basin of the Eden into that of the Kent. The Ennerdale Syenitic granite has wandered about under the same conditions almost as much, and has gone, along with Brockram from the foot of Stainmoor, granite from Galloway, granite from Shap, and various rocks from all parts of Edenside, over the high ground of Stainmoor and thence to the Vale of York. It is one of the rocks that may be expected to occur in the drifts of Tynedale. The remarkable feature connected with some of these facts of boulder distribution is the *rapprochement* of boulders whose main directions of transportal have been entirely different. The Shap Granite swept north-westward fifty miles from its source, to Carlisle, and afterwards moved from there another fifty miles in an easterly direction to Durham, was there turned southward by the North Sea ice, and thus actually rejoined the boulders of the selfsame rock that had travelled to the Vale of York in the current that came by way of Stainmoor.

I believe that it was the stream that came over by way of the Tyne Valley that furnished most of the boulders that are found in the maritime parts of Yorkshire: those of the Stainmoor stream having travelled southward mainly by way of the Vale of York. The same *rapprochement* of wanderers is observed on the western side of England. Indeed, it is just possible that the stream of Lake Country boulders that came down the Vale of York past Halifax, may actually have been joined again further south, by a branch of the stream, bearing boulders of the same kind, that came past West Cumberland and thence through Lancashire.

Differential Movements of the Ice on various platforms.—Reference has already been made to the differential flow of the ice sheets. Sir Andrew Ramsay, many years ago, expressed an opinion to the effect that it was far from unlikely that the higher parts of a thick sheet of flowing ice might be slowly moving in a direction different from the course taken by the same stream of ice at lower levels. He thought it possible that, under particular conditions, two currents might move even in diametrically-opposite directions over the same point. This idea was, of course, based upon what is known to be taking place on a small scale even amongst the glaciers of the Alps, whose laws of motion are, in other respects, strictly comparable to those of a river placed under like circumstances. In the vestiges of former ice action in the north of England it seems abundantly evident that such must have been the case there also, and that too, to a greater extent than Sir Andrew, at the time he made the observation, seems to have anticipated. The directions of continuous striation seen on many of the glaciated rock surfaces in the North of England shew in the most unmistakeable manner that this must have been the case, on the large scale, as well as on the small. A stream of water flowing over a boulder in its course illustrates this point well. A foot or so above the obstacle the water will be seen to be flowing in ordinary course in the main direction of the stream, while on the level of the boulder itself the stream can be seen to part to the right and the left and to flow for a short distance in courses even at right angles to the main current above. Occasionally, and for a short distance, the two sets of currents may even flow in diametrically opposite directions. The same thing happens, as Mr. James Geikie has pointed out, with a wave breaking on a beach, and the resulting undertow. The courses of glacial striæ clearly show that the same phenomena must have been of common occurrence during the Glacial Period. And it is quite clear that the phenomena were by no means limited to the small scale, but, on the contrary, they can be traced from cases covering areas of only a few inches up to areas whose superficies must be measured by miles. This fact has a most important bearing upon the perplexing distribution of certain

boulders, and their strange interweaving with others derived from different and often widely separated sources. Nothing is commoner in the drift of open districts than to find in one mass of boulder clay or other glacial deposit stones whose several parent sources are radial to the extent of ninety, or more, degrees to each other and their present location. There is no difficulty in understanding how this complex crossing and interweaving was brought about if the reader grasps the idea that the materials of the drift consist of old preglacial weathered detritus transported hither and thither in, on, or under the ice, under various conditions of glacial action, and liberated as a sediment on the spot where it is now found when the last great mass of ice melted. This last point will be discussed in a little more detail when treating more especially of the origin of drift deposits.

In the present paper it may be noticed that no reference whatever has been made to the action of *floating* ice. I have not thought it worth while to do so, as the facts observable in the area under notice are all dead against the view that floating ice has had even the smallest share in any of the phenomena presented by the Edenside drifts. On the other hand, as I have shewn in my paper in the *Quarterly Journal* already referred to, land ice, and land ice alone, can satisfactorily account for all the phenomena.

Propagation of Force through Ice.—Another property of ice, of some importance in its bearing upon the subject presently to be discussed, might almost be stated in connection with the last,—it is that the motion of a confluent stream of ice arising from two tributaries meeting at an angle is affected to a considerable distance down stream by the direction of flow of the more powerful tributaries. The line of swiftest motion of the Mer de Glace is affected in this way by the Glacier du Geant all the way down from Trelaport to the termination of the glacier, just as the line of swiftest motion of a river would have been affected under the same conditions. It was contended that the field evidence in the North of England suggested that we might push this analogy between the behaviour of a river and that of a glacier even farther than that, and infer

from the facts that force may be propagated a considerable distance through ice, not only in a horizontal direction, as it is in such a case as that of the Mere de Glace, but also, though to a lesser extent, in a downward direction as well. The results in this latter case, as in the former, being affected by the initial direction and force of the disturbing current as compared with those of the current disturbed. In treating of glacial erosion this subject will be adverted to again.

Vertical Circulation of the Ice.—It has long been known to observers of glacial phenomena, that the lower parts of the ice nearer the source of glacier tend to become its surface layers farther down the stream. This phenomenon was discussed at some length by J. D. Forbes (“Occasional Papers,” p. 202, *et seq.*) and afterwards more fully by Professor James Geikie, who had perceived the bearing of the facts mentioned by Forbes and applied them to the explanation of the upward transportal of boulders. (I may add that I had myself independently arrived at nearly the same conclusions from a study of the same facts, before I knew of Professor Geikie’s paper. The subject was “in the air” at the time.) This tendency of the lower parts of the ice to work up to the surface has been shewn to be partly due to the constant tendency of flowing ice to move in the direction of least resistance; so that where the ice encounters much frontal resistance, as it does in pushing its way over an obstacle, its lower parts, while moving forward, tend to flow also upward, relatively to the general level of that part of the glacier. But the principal reason why the lower strata of a flowing mass of ice tend to work up to the surface would appear rather to be that, while the surface layers of ice are constantly being removed through their melting by atmospheric causes, the general level is maintained with equal constancy through the upward swelling (or turgescence) of the ice consequent upon the pressure exerted by the ice nearer the source of the glacier. As the top ice is melted off successively lower strata swell up to the surface, while the whole mass is slowly moving outward from its source; so that what was the bottom layer at one point becomes,

farther out, in the middle, and finally in its turn forms the surface, becomes converted once again into water, sinks into a crevasse, freezes again at a lower level, and takes its place amongst other ice that will go through the same cycle of change.

Whatever be the true explanation, there can be no doubt about the fact that the bottom strata of ice near the head of a glacier tend to become its top layers farther out. And with the upflowing of the ice, substances entombed in the ice tend to work up to the surface also. Their rate of ascent is proportionate to the difference between their rate of descent through the ice under the action of gravity (a factor not of much importance in such a case) and the rate of ascent of the ice wherein they are entombed, under the combined action of ablation and turgescence just referred to. The nett result is a movement upwards; and most important this factor becomes in relation to the distribution of boulders, as James Geikie has shewn in the paper referred to. We can readily understand how certain boulders from the low grounds of Edenside have been transported up hill a thousand feet or more within a distance of five or six miles. How are we to explain such facts by any theory of submergence?

One result of the differential movements of the ice must have been to bring together over any given spot, boulders that had originally entered the main stream at many different levels, and that had been derived from sources situated, in some cases, at almost every point of the compass in relation to that particular spot. It is quite conceivable that the different platforms of the ice sheet around Penrith, for example, where its maximum thickness must have exceeded two thousand feet, may have consisted of ice that had originated, some in the Lake District, some in Galloway, some around Cross Fell, and some near Stainmoor, entering the seething mass from all points of the compass, and at every level up to the highest limit of the ice. Under the circumstances one can understand how at the climax of the Glacial Period, the ice around Penrith may have had, dispersed throughout its mass, detritus of all the rocks occurring in the areas whence the supplies of ice had been derived. These would include boul-

ders of Brockram from the head of the valley, Ennerdale Syenitic Granite, Galloway Granite, and a variety of other rocks transported in a diametrically opposite direction, while from directions transverse to these came boulders of Whin Sill, Dufton Granite, and Roman Fell Conglomerate from the Cross Fell Escarpment on the one hand, and representatives of the Older-Palæozoic rocks from various parts of the Lake District, St. John's Quartz Felsite, Shap Granite and Mardale Gabbro, on the other. While the ice was still moving up the valley, under the pressure of larger accumulations on the west, the combined effect of the waste of its upper surface under atmospheric influences and the turgescence of the whole, consequent upon the general level being maintained by the downflow from the thicker ice to the west, tended to bring any substances included in the ice nearer and nearer to the surface, at whatever elevation that may have had there.

Envelopment and transportal of Organisms.—None of the ice around Penrith ever included any considerable proportion of marine organisms; for, if I read its history aright, the sea bottom of the Solway had been scoured clean out, by the outflow of large glaciers moving seawards for long periods before the Ice Barrier crept so far south. When this did reach the North Channel and the ice within the Solway Basin was diverted inland, the confluent glaciers carried with them nothing but terrestrial and subglacial débris. But the case must have been otherwise with the parts of the Irish Sea further south. Here the ice must have traversed a sea bottom overspread with various older deposits containing the remains of organisms pertaining to the various colonies of Celtic, Lusitanian, Boreal, and Arctic species that had successively obtained stations there as the changes of their environments favoured the encroachment of the animals of one province or of one bathymetrical zone* upon that of another (*Geol. Mag.*, 1874).

* My colleague, Mr. Clement Reid, has reminded me of the importance of this point in its bearing upon the origin of shell beds of glacial origin. It would by no means follow that, when once such organisms had worked their way *into* the ice that the onward movement of the mass would result in the crushing of the shells. What we know of the behaviour of bodies entombed in modern glaciers would

Areas not invaded by Ice of extraneous origin.—I have assumed throughout this article, as well as in the earlier papers referred to, that throughout the whole of the Glacial Period there were large areas in the North of England that were never glaciated by ice of extraneous origin at all. This fact was distinctly stated in several places, and it was, clearly enough, also plainly indicated upon the map that accompanied the paper in the *Quarterly Journal*. I am most anxious to add my testimony to that of my late colleague Mr. Ward, amongst others, that there is no clear proof of any kind soever that any polar ice cap swept clean over the Lake District. The same is true of all the mountain masses I am acquainted with in the North. The inland and uphill movements of the ice were due, beyond a doubt, to the stoppage of the natural outlets for the ice deploying upon the Solway. The barrier that effected this was propagated in a south-easterly direction by accretions of local ice, and was not due, I feel sure, to the actual march of the Greenland ice itself across the land. There must have been a great barrier of that kind somewhere off our north-western shores; but it simply backed up the British ice, and in a general way determined the set of the major currents of the ice it was ponding back. There is every reason to believe, in regard, for example, to the ice of the Lake District, that even under the most intense conditions of glaciation, the *bottom* layers of ice radiating outwards from the high lands maintained their initial direction of movement, in some instances, miles away from their starting point. This is clearly shewn by the glacial striæ in many places. The map appended to the paper in the *Quarterly Journal* (xxxi. pl. ii.) shews such striæ at Blencow, near Penrith, where they may be easily examined close to the Blencow Station. Others are shewn near to Skelton, still farther removed. All these clearly point to glaciation outward from the Lake District, and they are only instances selected out of seem to shew that substances may be transported great distances in ice, and, in doing so, work up from the bottom of the ice to its surface, without being much the worse for their journey. See Tyndall's "Glaciers of the Alps," p. 76, and J. D. Forbes' "Occasional Papers," pp. 193—195, upon this point. It is quite likely too that the shell-bearing beds may have remained in the ice as frozen masses, and thus would travel much as would solid boulders.

many of the same kind that could be adduced in support of the same view. But it does not follow that the whole mass of ice over that spot moved in the same direction, or at the same rate either. The differential movements of the various platforms of the ice sheet did, in the case under notice, result in transporting, in the higher parts of the ice, detritus primarily derived from parent masses situated at almost all points of the compass in relation to that particular spot, as well as, under particular circumstances, transporting, at a high level, boulders in opposite directions to that of their initial course. On the outskirts of the Lake District there are many instances of boulders of certain rocks that have first travelled outwards under the influence of the local currents, and then, as they worked their way upwards in the ice and came under the influences of the upper currents that were setting inland from the Solway, they were swept backwards again in the ice towards the heart of the mountains. (A reference to the map will make it clear that "the strong upper currents setting in from Scotland" (*Geol. Mag.*, Nov., 1874,) did *not* move in diametrically opposite directions to that of the local outflow. No one that would take the trouble to read the original statements could fail to detect the travesty of my views published with the above quotation.) And it was much the same in some other instances in this district, as it has long been known to have been the case. In the Eden Valley, as I have before pointed out, there are abundant instances of this cross-transportal of drift materials, and instances other than those referred to will be found in the paper just mentioned.

Relative Date of the Maximum Glaciation.—There are almost no data that will enable us to form any satisfactory conclusions in regard to the dates of the various phases of the Glacial Period above noticed. If we may judge by the enormous quantity of material that can be proved to have been carried away by the ice from areas of limited extent, such, for example, as the St. John's Quartz Felsite, the Shap Granite, Sale Fell "Minette," and others, (which enable us to form some kind of idea of the quantity of rock removed from other rocks less easily traced in the drift,) confirmed

as this is by proofs of deep scoring and grooving, which also must have required a vast interval of time for their formation, the period of earlier glaciation must have been one of vast duration. If we accept Mr. Croll's date for the commencement of the Glacial Period, viz., 250,000 years ago, and agree with him that it lasted some 170,000 years, there is no difficulty in accounting for the vast quantity of rock removed from its parent source by glacial action. Whether the earlier part of this period was or was not broken up by interglacial periods of comparative warmth, or whether the succession of events included many oscillations of level of the land there does not seem, in the districts herein specially treated of, any evidence whatever. To find such evidence we have to turn to such districts as East Anglia and the Yorkshire coast, where the later glaciation left many of the deposits of older date undestroyed. What I have contended is that the date when the present distribution of the boulders took place was that period of highest glaciation when the icy flood reached its maximum, and when, debarred an exit by way of the Solway, the ice of Edenside overflowed for some time across the Bewcastle Fells into the Tyne Valley; across the higher parts of Stainmoor into the Valley of the Tees; and across the Shap Fells into the basin of the Lune. The relative date of this period can be made out easily enough, and it can be shewn to be contemporaneous with the period when the south-westerly advance of the Scandinavian ice drove the land ice currents in the Midlands south-westward into the basin of the Trent, and reinforced the local sheets of ice, so that they extended as far southward as the Thames Valley before the zone was reached where the rate of melting balanced the supply. In a paper published in the *Proc. Geologists' Assoc.*, IX., No. 3, in dealing with the question of the age of the Thames Valley Brickearths I have pointed out that their origin, and that of other similar deposits, admits of a simple and ready explanation if we assume that they are due to the ponding back of the waters of the rivers by ice extending southward from Scandinavia. And it is to this period of the invasion of Britain by ice of extraneous origin, coming south-westward by way of Scandinavia on the one side, and south-

eastward by way of Greenland on the other, that I would refer the age of the Thames Valley drifts, and all the later glacial deposits overspreading England, from Finchley to Stainmoor and the Eden Valley. But for this reinforcement of ice of extraneous origin, large parts of the lowland districts of England would never have been overspread by ice at all, and our English glacial phenomena would have been confined to evidences of a few rather large glaciers, confined entirely to mountain regions, and rapidly lessening in point of development, even in such areas, as they were traced towards the south. (*Proc. Geologists' Assoc.*, IX. p. No. 3.)

Latest Glaciers of local origin.—Leaving, for the present, the consideration of what happened at the close of the maximum period of glaciation, I would here notice the later glaciation usually regarded as bringing the long succession of periods of extreme cold to a close. In regard to the extent of this later glaciation, I feel sure that, in England and Wales, at all events, its effects have been considerably over-rated. Many of the accumulations of drift regarded by some observers as moraines belonging to this period, are, I feel sure, merely heaps of rubbish and sediment left on the melting of the great ice sheet, and are moraines only in form. Here and there, however, the larger valleys did certainly nourish a few tiny glaciers after the great ice sheet had disappeared. There seems to be several such in the Lake District; and in Edenside a few traces of them may be seen along the Cross Fell Escarpment. Such are those at the foot of Hikable, or “High Cup Gill”; again at Coska, near Dufton Pike, and at the upper part of Swindale Beck, Knock; at Haverskils, above Milburn; Foxhills, near Blencarn; and at several other places similarly situated. What evidence there is in each of these cases shews plainly enough that the last period of glaciation followed a comparatively warm period; that the glaciation itself was mainly confined to very small areas; and that the action of the ice was practically limited to pushing out the sediment and detritus left on the melting of the great ice sheet, and arranging the material in mounds. In the majority of cases it is doubtful whether the later ice remained long enough to scoop

out all the drift left by the older ice, or to cut down to the solid rock beneath. The drift that is left in the bottom of these valleys, and the materials of the moraines themselves, consist, not of detritus native to the part of the valley traversed by the little glacier, but of the far-travelled material nearly identical in character with that composing the bulk of the older sediment left by the ice sheet.

Abrupt termination of the period of maximum glaciation.—Between the commencement of the period of minor glaciation and the close of the period characterised by the dispersal of Shap Granite Boulders over Stainmoor, there appears to me to have intervened a decidedly warm period, when little or no ice was formed, and when the whole of the great mass of ice of the ice sheet melted away on the spot. Judging by the character and the direction of the glacial markings left in Edenside, the movements of the ice sheet seem to have been brought somewhat abruptly to a standstill, which was followed immediately by the melting of the ice there and then as it stood, and the liberation of its contents in the form of sediment on the spot. It looks very much as if a change in the direction of flow of some of our great ocean currents had been effected somewhat abruptly, and a correspondingly abrupt amelioration of the climate of the North Atlantic had at once ensued. The edge of the Great Northern Barrier began to recede from our shores, and the local ice at once ceased to move inland and uphill. The rate of melting of the winter snows exceeded the supply, and no more new ice was formed. The whole mass, as I have before said, melted as it stood; and the waning ice sheet did not pass in reverse order through the series of changes that accompanied its increment. The form and direction of the striæ shew in the plainest and most unmistakeable manner that it did not break up into a series of small glaciers; on the contrary, it is quite clear that the ice never moved after it had attained its maximum development. I insisted much upon this fact some years ago; but even yet its significance seems to have been missed.

Part III.—THE ORIGIN OF OUR GLACIAL DEPOSITS.

Earlier views.

Detritus in modern Bergs and Glaciers.

Distribution of Detritus through the Ice Sheet.

The Melting of the Ice and its attendant phenomena.

Relation of External Configuration of Drift Mounds to the rock surface beneath.

Water-worn Detritus in Drifts.

Formation of Gutta Percha Clays.

How the Faults and other disturbances contemporaneous with the Till were formed.

Contemporaneous Contortion of the Drift.

Horizontal passage of Till into Sand and Gravel.

Undisturbed Deposits beneath Boulder Clays.

Thickness of Drift.

Eskers.

Relation of Eskers and Moraines.

Marine Organisms in High-level Drifts.

Earlier Views.—Up to 1874 the explanation of the origin of Till most generally accepted (I mean by those geologists whose acquaintance with well-glaciated regions qualified them to judge) was that the Till represented a mixture of débris originating as surface moraines, which had been ground up beneath the ice and there incorporated with other material rasped off the subglacial rock-surfaces by the stone-shod sole of the ice sheet. (Those who really know anything about the glacial phenomena of mountain districts will not expect me to waste their time by discussing here any theories that ascribe the origin of Till to marine action.) It seems to have been assumed that the paste of mud and stones accumulated under the ice in the way just referred to, was dragged about from one spot to

another as the ice moved, always keeping between the ice and the rock, and that it ceased to accumulate when the movements of the ice had ceased, and was then left just in its present position and with its present characteristics, when the ice finally disappeared. That seemed a very plausible view; and much of the Till, which at first sight looks like a stony paste quite devoid of stratification, seemed to be exactly the kind of material that, one would think, must of necessity result from the action of such causes, which all are agreed must have been at work on that spot.

Then in regard to the distribution of the boulders so plentifully scattered about the districts where the Till occurs, nothing could be more natural than to suppose that they represent some of the material transported on the surface of the ice, and left stranded in their present position when the ice retired from there. In the cases where the boulders lay at higher levels than their parent masses—a phenomenon of much more common occurrence than many persons suppose—the agency of floating ice distributing boulders during an imaginary period of submergence was called in to meet the case. The same agent was usually invoked to explain the puzzling phenomena of the crossing and interweaving of boulders derived from sources situated at remote bearings from each other in relation to the point where they now rest.

Detritus in modern Bergs and Glaciers.—Strangely enough it seems to have been assumed, almost on all hands, that the ice of the Glacial Period was practically free from detritus of any kind: perhaps because freedom from included materials was supposed to be one of the most marked characteristics of modern glaciers, as well as of even the larger masses of ice seen in the form of bergs. Yet a study of almost any full account of the glacial phenomena of the Arctic, or better still, of the Antarctic regions, must have shewn that this supposed purity of the ice is more apparent than real. One has but to refer to so well-known a book as *Lyell's Elements*—to say nothing of others—to see that voyagers make mention, again and again, of the vast quantities of mud and stony material transported *in* the ice, and forming part of its mass.

One does not see how the fact could well be otherwise, except as in the case of some of our oldest masses of ice. In Greenland, I conceive, and to a certain extent also in the Alps, we have to remember that glaciation has probably gone on almost continuously from late Pliocene times down to the present day; and any loosened and disintegrated rock material that may at one time have formed the surface rasped by the ice, has been long since removed, so that the ice has none but sound and unweathered rock to work at. In such cases, if no land rises above the level of the ice to furnish by its atmospheric waste the material for surface moraines, the ice may well be clean and free from detritus. It is significant, if Mr. Croll's views are correct, that mention of stony and muddy ice should be made more often in connection with the icebergs of the Antarctic regions than with those of the Arctic. In the North the Glacial Period is now waning, and the rock-surfaces have been ploughed and rasped down to the very heart of the rock; while in the Antarctic region the Glacial Period has not long set in, and the preglacially-weathered rock of that part has only just been attacked. Be the explanation what it may, there can be no doubt that vast quantities of stony material *do* occur *in*, as well as on, modern icebergs. And as icebergs are nothing but large floating masses broken off from larger masses of ice on land, it follows that these masses of land ice are themselves charged more or less with stones and mud.

Distribution of Detritus through the Ice Sheet.—If the reader have followed the observation made in the first part of this paper relative to the means whereby stones and mud worked their way into ice, as well as to their distribution hither and thither in the ice under the action of currents, and also to their circulation from one platform to another under the action of the complex forces at work throughout the whole period of glacial action, he should have no difficulty in forming some kind of idea of what must have been the state of the Ice of the Glacial Period in this respect at the time when it had come to a standstill and liquefaction had commenced. Take the case of the ice over where, thousands of

years afterwards, the earliest settlers chanced upon the site of modern Appleby. At that point there was a mass of ice two thousand feet, or more, in thickness, whose upper surface formed a nearly-continuous platform, level with the top of Mickle Fell, on the one hand, and with the summits of the Lake District hills, on the other. This ice had been made up of innumerable separate streams, united into one compact mass, which had originated at different localities situated at almost every point of the compass in relation to that particular spot. Each stream had brought with it various quantities of the detritus picked up in its own neighbourhood, and the united mass of ice had been set seething and working under the action of the complex forces described in the first part of this paper. As a consequence, stones from Galloway (Criffel Granite, etc.), detritus from all along the north side of the Lake District, including Shap Granite; stony matter from the Cross Fell Escarpment; and material transported in various directions from the higher parts of Edenside, were mixed with each other and with mud and stones that had come from nearer at hand. Many of the stones had worked their way up in the ice considerably above the level of the parent rock. The so-called "granite" (quartz porphyry) of Dufton, and the Brockram, for example, amongst other rocks, had worked up into the ice to a level of *more than a thousand feet* above that of the parent masses in situ, and were to be found in the ice at this and at all lower levels, right up to the head of the valley, and thence by way of Stainmoor out in the direction of the Vale of York. The same general observations, made in connection with the ice at Appleby, will apply more or less to the rest of the Edenside ice; with, however, this difference, that in the parts of the ice where strong local currents had persistently set outwards from the mountain masses in sufficient force to prevent extraneous currents from working inland at *any level* in the ice, this local ice contained no boulders of extraneous origin, but only such material as was derived exclusively from the particular localities whence the local streams had issued. But there were large areas that had long been a kind of debateable land. The local currents emanating from the larger masses of high land had,

in the main, been able to hold off the invading ice ; but occasionally, the upper platform of the ice (while the lower platforms still maintained their normal direction of flow,) would move inwards towards the heart of the mountains (when the pressure exerted by the extraneous ice overcame the local resistance). Sometimes this took place even in directions diametrically opposite to those taken by the ice lower down. The result was that while the lower currents carried local detritus outwards, the higher currents transported material of other kinds in nearly the opposite direction ; and so, the material dispersed throughout the ice over that particular spot included boulders whose direction of transportal was nearly diametrically opposite to that of those movements of the sole of the ice that effected the glaciation of the rock.

The Melting of the Ice, and its attendant Phenomena.—This leads to the point I have been for some time aiming to reach, viz :— (1) That the chief glacial erosion of the district was accomplished mainly in the long period preceding the climax of the Glacial Period. (2) That the glacial markings and striæ now existing represent only the *last* movements of the ice, and therefore date mainly from the climax. (3) That the *distribution* of the boulders represents the nett result of all the causes acting upon the boulders from the commencement of the Glacial Period down to its very close, largely modified by the very last movements that took place before the ice began to melt. It was the melting of the ice, and the consequent liberation of its contents there and then, in the form of sediment (which was sometimes modified by the action of running water) that gave rise to the various forms of drift here. Some of the phenomena attendant upon this melting of the ice sheet may conveniently be reviewed at this point.

Relation of External Configuration of Drift Mounds to the Rock Surface beneath.—Amongst the phenomena above referred to, one of the most curious was pointed out to me in 1872 by my colleague Mr. Aveline ; and had been noticed, I find, also by Mr. Macintosh, and others. This is, that the external configuration of a mound

of drift follows in a general way that of the rock surface whereon it lies ; and that the component layers of this drift conform in their inclination, in a general way, both to the slopes of this core of rock, and to the inclinations of the surface of the mound itself. And this is true whether the inequalities of the surface are on the small scale or on the large. We all know too, how, in a general way, modern streams follow approximately the same courses as their pre-glacial representatives. I dwelt at considerable length upon the origin of these curious phenomena in the papers mentioned at the head of this article. The surface of the drift mounds very frequently represents in a general way the contour of the rock surface beneath it, just as the surface of a field of corn represents in a general way the larger inequalities of the surface whereon the corn is rooted. And what is more remarkable still is, that this curious relation between the external form of the drift mounds to their internal structure, and to the form of the surface beneath, is not by any means confined to mounds of Till, but is observable almost as frequently in well-stratified deposits, such as the mounds of sand and gravel. In eskers the fact of the correspondence between their external form and their structure has long been known, and, one may add, is not so difficult to account for on any of the theories of their origin commonly received. But how are we to account for such relations as those referred to, when the origin of the more clayey drifts and the Till are being discussed? Certainly neither the theory that the Till represents a *moraine profonde*, nor that theory that refers its formation to the action of floating ice, in any form, is adequate to account for the facts. In considering the arguments in support of either of these theories, one cannot help being as much struck with their inadequacy to explain such phenomena as either these or that remarkable transport of erratics uphill far above their parent sources, which is so common a phenomenon in nearly all highly glaciated districts.

All these difficulties (and many others that we need not consider now) vanish, if we reject these older views, and regard all the forms of drift found in this area as so many modifications of sediment, once dispersed through the mass of the ice, and liberated,

as the ice melted, at or not far from the spot where the drift is found to-day. In the notes that follow, I shall attempt to account for many of these glacial phenomena by this, as it seems to me, simpler method.

First, in regard to the relationship between the forms of the drift mounds and those of the underlying rock. We have first to remember that when the ice of the major period of glaciation ceased to move, and began to melt away on the spot, this ice was charged throughout with mud and stones of all sizes. In places the proportion of extraneous materials of this kind to the ice may have been even as high as one to fifteen, or even, locally, and in exceptional cases, as much as one to ten. We have also to remember that one result of the prolonged rasping and grinding of the rock surface was the formation of wide furrows ranging, in a general way, with the direction of outcrop of the harder beds of rock, but more or less modified by the predominating direction of movement of the ice through its whole stay there. Now, when the ice began to melt, the water resulting from its liquefaction would naturally flow away towards the lower ground along any lines of depression that might happen to traverse the rock surface beneath the ice. As a consequence, as the ice melted, and the stones and mud were liberated from any part of the ice, this sediment would naturally tend to remain in greater quantities at those points where it was out of reach of running water, than along those lines where the water of liquefaction was working its way seaward between the ice and the rock, as it was along the furrows. Consequently, as the liberation of the sediment, mud, sand, gravel, and boulders, proceeded, more and more of it accumulated over the old pre-existing ridges, until in the end these became enwrapped in layers one over the other, the form of each layer, in a general way, being determined by the form of the surface beneath. I do not for a moment suppose that as the ice melted it formed *bridges* across the furrows extending from one mound to another. No one who has learnt anything of the plastic nature of ice could suppose that for a moment. On the contrary, I have very little doubt that the ice was always in contact with the growing mound of drift, and

that it was nearly always in almost as close contact with the material at the bottom of the furrow. The *quantity* of drift left in this way was proportionate—*1st*, to the amount of material in the ice as compared with the thickness of the ice itself; and, *2ndly*, to the distance of the point in question from the head of the valley. It must be obvious that where the ice was thin, as it was on the higher parts of the *sides* of valleys, there was less detritus in the ice than there was over the middle of the valley. Where the ice was 2000 feet thick, there must have been more sediment left than where the ice was thin; just as we should get more sediment left at the bottom of a vessel containing Thames water to a depth of two feet than we should in another vessel where the depth of the same dirty water was only an inch.

Water-worn Detritus in Drifts.—Then in regard to the second point, it must be obvious that there must be less water flowing beneath the ice in the higher part of each hydrographical basin than there was nearer the sea, just as is the case with the volumes of the rivers themselves. Consequently, much more of the finer materials tended to be washed away to sea in the lower part of each basin than was the case nearer the valley head. So we should expect to find an increasingly large proportion of washed and water-worn materials in the old subglacial sediments as we follow them outward from the watersheds towards the sea; or, to put the statement in another form, we should naturally expect to find an increasing proportion of Till to water-worn material as we approach the heads of the valleys. More than this. The ice melted at the upper surface faster than it did at its lower, and detritus was liberated there in proportion to the rate of melting. This is a very important factor in the formation of the various kinds of drift. Much of the material liberated at the surface of the ice would be more or less rolled and washed by the action of the glacier streams, the finer materials—the sand and mud—being washed down the crevasses and moulins to be mixed with or interstratified with the stuff accumulating beneath the ice; while much of the coarser detritus would, by the action of the same streams, be rolled into

gravel, which itself would eventually contribute to make up some or other of the various forms of drift.

Under the action of the various agents I have briefly noticed, an infinite variety of combinations of mud, clay, sand, gravel, and boulders of all kinds would be accumulated. At one place the materials might be deposited, from top to bottom, in the form of a stiff paste of clay stuck full of stones of all sizes, dropped, or melted, into the clay without the slightest regard to either their shape or their size. At another point, glacial streams resulting from the melting of the ice might deposit sand, gravel, or water-worn material, in any proportion, and these deposits were just as likely to be left in a stratified form as in any other. Far away from the margins of the hydrographical basins, at the points where much ice-water was flowing seawards, the whole of the material liberated by the ice might be expected to be more or less water-worn in character. And here it occurs to me to make a remark suggested years ago by a criticism on my views on this subject put forward in the *Geological Magazine* by my colleague the late Mr. E. T. Hardman. I have already pointed out that the character of the erratics in a glacial deposit at any given spot was determined by a very complicated set of causes. The results may be briefly summarized as the *nett results* of all the transportals the several erratics have undergone since being detached from the parent rock. Now when the Ice Sheet melted, the subglacial streams, being influenced in their directions by an entirely-different set of causes from those affecting the movements of the ice, must necessarily have transported water-worn material in different directions from what those materials had ever taken when they were in the ice. And so it must often have happened that the water-worn detritus characteristic of the drift of one area has been rolled to a distance, and mingled there with drift totally different as regards the parent sources of their constituent erratics.

The explanation above given of the origin of the drift mounds or drumlins, will serve also to account for the fact that the large axes of these drumlins lie approximately in the same direction as those of the preponderating directions of movement of the ice

here. Along those directions the rock surface is ridged and furrowed most, and the form of these ridges and furrows has been, so to speak, propagated, through the drift afterwards moulded over the surface as the ice melted.

It will also help us to understand the other cases wherein the axes of the drumlins do *not* lie in the same direction as that of the glacial striæ. The direction of the striæ merely represents the directions of the very last movement of the ice, which direction may have prevailed only for a few thousand years; while the direction of the greater ridges marks the prevailing line of movement through a period very much longer.

Formation of the Gutta Percha Clays.—The origin of the finely-laminated beds of clay known as gutta percha clays, which are so commonly found in association with the more clayey forms of drift, meets with a simple explanation on the view above set forth. They are due to the successive deposition of films of clay deposited from trickling sheets of muddy water flowing from the ice over the clay surface beneath. Their formation necessarily occupied much time; for it seems clear that each of the layers, many of them as thin as

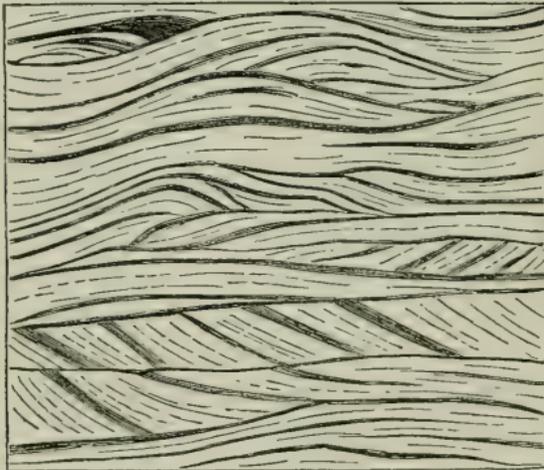


FIG. 1.

Laminated Clays and Loams more or less affected by thrust planes due to the movements of the melting ice above it. Length about 12 inches.

Cutting in the Midland Railway, near Langanby.

the paper this is printed on, must have been formed by a separate flow of water from the one that preceded it, or that followed it. In many of the sections where these clays are exposed, they exhibit some very curious, and at first sight, very puzzling phenomena. Some of these are shewn in the figures below, which represent laminated clays exposed during the formation of the Settle and Carlisle Railway. They were chiefly seen in the cuttings near Culgaith and Langanby, four or five miles north-east of Penrith. For leave to use these figures, which illustrated my paper in the *Quarterly Journal of the Geological Society*, I am indebted to the Council of that Society.



FIG. 2.

Section across the Midland Railway near Langanby, shewing alternation of Till (T.), Sand and Gravel (s.g.), and Laminated Clays (c.) overlying New Red Marl (in the right hand corner).

How the Faults and other disturbances contemporaneous with the Till were formed.—The explanation of some of these phenomena can be more conveniently considered here. On the supposition that the whole of the glacial deposits here noticed were engendered beneath the ice after it came to a standstill and had begun to melt, we should be prepared to find some evidence among these deposits of the exertion of enormous downward pressure, due partly to the normal down-settling of the ice as it moulded itself to the configuration of the surface beneath; partly to its subsidence more abruptly, as would happen where tension came into play, and lumps of ice broke off and filled up cavities below; and partly also to slight occasional movements of the ice laterally, as it yielded unequally before the forces that were acting upon it. Abundant evidence of such movements as would result from any of these causes, may be detected in nearly every section of drift exposed. Indeed it would

perhaps be correct to state that such phenomena, in some form or other, are never absent from true glacial deposits. Amongst these phenomena are the slickensided faces of drift, which were noticed first, I believe, by the late Hugh Miller, and were termed by him "striated pavements." These closely resemble the appearances seen on the divisional planes of hard rocks near to a fault; and like these last, these "striated pavements" are due to the slipping, in the plane of least resistance, of one part of a rock over another part, under great pressure. In the case of fault-slickensides, the pressure that gave rise to these phenomena was applied in what was, practically, a horizontal direction, and the plane of striation, following the plane of least resistance, is vertical (or practically so). In the case of the glacial deposits, the stony paste was squeezed against the hard rock by the pressure of the superincumbent mass of ice acting from above downwards, and the plane of least resistance lay, consequently, in a horizontal direction, and it is along that direction, or that approximately, that the rock has slipped. This is only another way of saying that the settling down of the ice gave rise to small faults of very low hade, or as they might be called, "thrust planes." These thrust planes very commonly severed small deposits already laid down, and pushed one part (often with more or less accompanying disturbance) many feet or many yards away from the point where it originated. This phenomenon is well illustrated by the accompanying figures.



FIG. 3.

Disturbed Laminated Clays, probably originally deposited in nearly horizontal sheets, and afterwards deranged by lateral movements resulting from the down-settling of the melting ice sheet above. Length of section, 9 inches, Midland Railway cutting near Langanby.

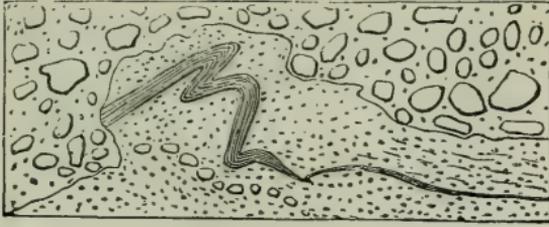


FIG. 4.

Contorted seam of loam in Sand and Gravel. Midland Railway cutting near Langanby.

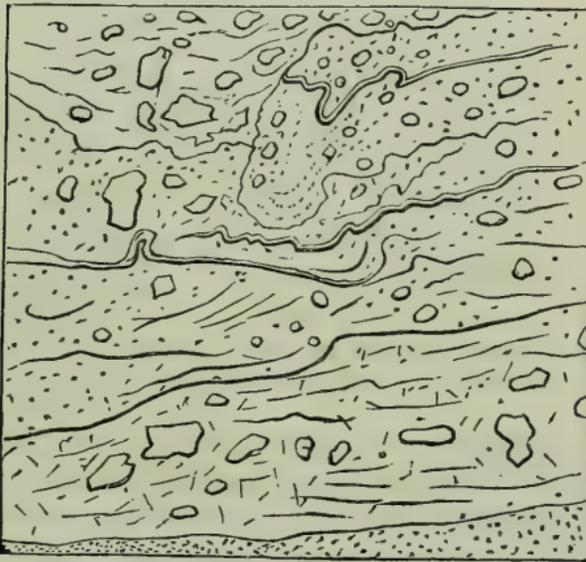


FIG. 5.

Puckered seams of loam and clay in stony loam. Length of section, 4 feet. Midland Railway cutting near Armathwaite.

Contemporaneous Contortion of the Drift.—Another phenomenon of very common occurrence in the drift is that of zones of puckered and contorted strata interlaminated with others hardly disturbed at all. Such phenomena have long been recognized as due to the disturbing action of ice in some one of its many forms. Of course the impact of masses of floating ice bumping against partially-consolidated strata, would produce the same kind of effect. In each, the disturbance would extend downward only as far as the strata

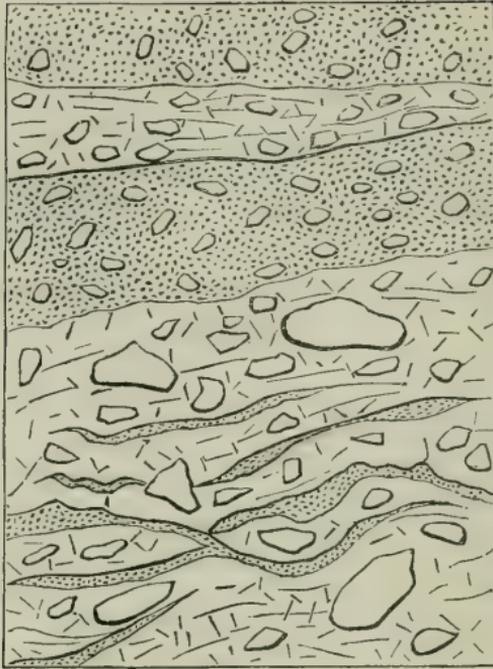


FIG. 6.

Intercalations of loam and clay in Sand and Gravel, with Till. Width, 6 feet.
Midland Railway, Throstle Hall cutting.

affected were pliant; and when the disturbing cause ceased to act, the resulting crumpled and contorted strata would naturally be covered up by other strata undisturbed. Appended are illustrations of these phenomena, taken from Cumberland drifts, where they are due, I believe, to the irregular subsidence of the melting ice sheet upon the pliant masses of sediment accumulating below it, and giving rise to phenomena of the same nature as the "creeps" in coal mines. By way of further illustration of the same phenomena, I have here inserted, by permission of the Council of the Geologists' Association, a figure illustrating a paper of mine on "The Superficial Deposits of North Kent," published in the Proceedings of that Association. In this case I feel sure that the contemporaneous crumpling, shewn on various horizons, resulted from the disturbing action of *floating* ice upon the Thames Valley deposits, at the time when the Scandinavian Ice-Sheet had extended so far south

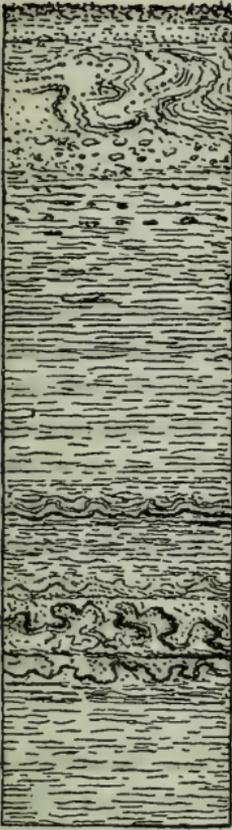


FIG. 7.

Section of Pleistocene Loams and Gravels (Thames Valley Deposits) at Erith; shewing evidences of contemporaneously puckered Loams alternating with beds not disturbed. Scale 10 feet to an inch.

as to obstruct, or to dam back, the water of the rivers flowing into the North Sea and the English Channel. It is by the action of floating ice in re-sorting and re-distributing the old surface waste far and wide, at a time when our southern areas were flooded into great lakes by the action of the glacial dams referred to, that I would ascribe the origin of the Thames Valley Brickearths and their associated flint gravels, with implements. I would go further than this, and be inclined to regard the anomalous distribution of the implementiferous gravels and loams of *all* the areas draining into the English Channel as due directly or indirectly to the action of either ice from the Scandinavian Ice-Sheet, or else from its western analogue that came down St. George's Channel. These implementiferous gravels would thus be, according to this view, contemporaneous with the transportal of Shap Granite across

Stainmoor. In other words, I regard them as of the same age, and as primarily due to the same set of causes. The contortions on the top of the section at Erith (fig. 7)—that is to say the "Trail"—date from the period when the icy barrier was retiring, in other words, to the period when our Cumberland and Westmorland drifts were in course of formation.

Horizontal passage of Till into Sand and Gravel.—There is very little to add to what I have stated above in regard to the horizontal passage of Till into deposits consisting chiefly of water-worn and rounded materials. These last are, I think, simply the ordinary materials liberated from the ice as it melted, but modified more or less by the rolling and wearing consequent upon the action of the water proceeding from the melting of the ice nearer the margin of each basin. One would expect, from the very nature of the causes at work, that where the sediment liberated from the ice lay in the path of larger bodies of water in movement, the materials of that sediment would be more or less modified in consequence. And that is exactly what is the case as a rule.

Undisturbed deposits beneath Boulder Clays.—The existence of soft and incoherent strata lying apparently without any signs of disturbance underneath boulder clay, and in places that have almost certainly been traversed by thick masses of ice in motion, has often given rise to much discussion, and has been explained in a variety of ways. In many such cases in East Anglia, for example, there seems to be no doubt, as Mr. Reid has pointed out, that some of the older deposits were, during the periods of more intense glaciation, compacted by freezing into masses as hard as the ice itself. I am inclined to think that there were also other factors at work, which will have to be taken into account. Amongst these I think we must not overlook the *angle of thrust* of the moving ice. Where the direction of thrust formed a large angle with the surface affected, there cannot be much doubt that considerable disturbance would result, and any quantity of the rock affected might, in time, be removed. But where the direction of thrust formed a very low angle with the surface, as it usually did far away from the influence of the higher

masses of land, I think it quite likely that the movements of the ice took rather the form of *rolling* than of gliding. That is to say, in the case of the low ground I would liken the movements of the ice to the movements of dust when driven along a road by the wind, rather than to those resulting from the use of the broom. Both kinds of results may, of course, occur separately, or may occur combined, any number of times in the same section.

Thickness of Drifts.—In regard to the thickness of the glacial deposits at any given locality, I consider that thickness to be always directly proportionate to the quantity of detritus contained in the ice when it melted over that particular spot, less by the quantity carried away by the action of the streams resulting from the melting of the ice, as well, of course, as by the quantity removed by various agencies in postglacial times. There are exceptional cases where an unusual thickness of drift has been proved; but there is usually no difficulty in accounting for the excess by local causes. The drift is nearly always thickest in the low grounds in the immediate vicinity of mountain areas: this is *a priori* exactly what might have been expected. Its thickness in the low ground bordering on the Solway was proved in the boring at Abbey Town, recorded by Mr. Holmes (*Quart. Jour. Geol. Soc.*, May, 1881,) to be considerably over a hundred feet. At this part, if I am not mistaken, the thickness of the melting ice must have been something between 2,500 and 3,000 feet. Setting the thickness proved in the boring at one hundred and fifty feet, and the thickness of the ice at 2,500, which is probably well within the mark, we find that there was a proportion of detritus to ice of three to fifty. In other words: the quantity of mud, dirt, and stones dispersed throughout fifty feet of ice was, when it was collected all together, only equivalent to about three feet. Had we been able to examine the ice at the time, we should probably not have regarded the quantity of material contained in it very excessive, as compared with the quantities known to occur in bergs even at the present day. And yet this instance is an extreme case where the sediment is unusually thick, and is intentionally selected as such,

Eskers.—In regard to the much-vexed question of the origin of those extraordinary chains and strings of sand-and-gravel mounds called Eskers, I am still, as I was in 1874, inclined to regard these also as only another form of sedimentary deposit left by the melting ice. I believe that their position in the first instance was determined by the mounds they stand upon having been high enough above the stronger currents of the subglacial streams to allow of the accumulation of sand and gravel resulting from the washing of the Till higher up the valley. This was occasionally added to, perhaps, by material washed down through moulins and crevasses. When once such a mound was started, the action I have above described would tend to perpetuate its form as it increased in size. It would be precisely at the spots where such subglacial mounds occurred that, as the ice became weaker and thinner under atmospheric and other waste, crevasses and their accompanying moulins would be more readily developed, and, consequently, where the water of the superglacial streams would sweep down in greatest quantities the boulders, gravel, and sand that were being liberated at the surface. And as this process would, by my theory, go on until the continuity of the ice sheet was destroyed by melting, there would certainly be formed, as the last traces of the ice sheet vanished, long chains of steep-sided hummocky mounds enclosing land-locked hollows, just as we find them in esker regions.

Relations of Eskers and Moraines.—I am inclined to regard some of the esker-like mounds occurring in places as having originated in much the same way as a moraine. But as a rule, they are not *terminal* moraines. I for one do not believe that such a thing as the terminal moraine of the great ice-sheet can anywhere be seen. Here and there, where the ice-sheet was melting over a great ridge, or along a great hill side, quantities of materials liberated by the melting of the upper parts of the ice, and set free on its surface, were washed off that surface on to the land exposed by the withdrawal of the ice. And in this way esker-like, or moraine-like, mounds would be produced. But in no sense can they be regarded as terminal moraines. Such mounds occur here and

there along the foot of the Cross Fell Escarpment, and a very well-marked chain of them ranges along the hills separating the lower parts of the valleys of Wensleydale and Swaledale. The reader interested in these features will find them described in some detail, and their probable mode of formation discussed, in my paper in the *Quarterly Journal* so often referred to.

The only true moraines occurring in the area under notice are those tiny accumulations already referred to (p. 133) as due to the action of the later glaciers that came after the close of the comparatively warm period when the Ice Sheet was melting.

Marine Organisms in High Level Drifts.—There are no shelly glacial drifts in Edenside, but if there were, the occurrence of such would by no means imply that any submergence of the land had taken place. Indeed I might take the present opportunity of again stating my conviction that, excepting some low-lying maritime deposits, which need not be considered here, there is absolutely no evidence of any submergence whatever. And I may add that much of the evidence that has been adduced elsewhere in support of such theories, seems to me capable of quite a different interpretation. There were, doubtless, many small oscillations of level, especially in the earlier part of the Glacial Period; but, like the evidence for any interglacial periods of warmth (except the one following the climax), the evidence of such in the North-West of England seems to be entirely gone now.

In regard to the origin of many such shell-bearing deposits, excluding such as those of the Clyde, I still fail to see any difficulty in regarding the present position of the included marine organisms as due to the same causes that carried rocks inland and uphill from the bottom of the Eden Valley on to the summit of Stainmoor, a thousand feet or more above the source of the parent rock. I believe that the original deposits containing those marine organisms now in the drift, have worked up into the ice (perhaps as Clement Reid has suggested, while the matrix enclosing them was itself frozen), and that, once in the ice, they have gradually risen to higher levels in it, under the combined action of ablation and turgescence, as the ice slowly moved landward. Then, when the

ice melted, they were left along with the associated material of inorganic origin (*Geol. Mag.*, 1874, p. 510). In the majority of cases, as geologists have long remarked, these organisms from high level drifts consist chiefly of the harder and less destructible portions alone, and some of these themselves actually shew signs of glacial striæ. Mr. Clement Reid has called my attention to the fact that the assemblage of mollusca found in these deposits is such as is never known to occur within the same bathymetrical zone. This alone (without taking account of the anomalous admixture of Celtic, Lusitanian, Boreal, and Arctic mollusca that characterises such glacial shell-bearing gravels), is sufficient to put us on our guard before accepting the evidence of these shells as proof of submergence. On Mr. Reid's view, that large masses of frozen mud, containing organisms, have been repeatedly transported considerable distances *in* the ice and afterwards liberated as it melted, there ought to be no difficulty in accounting for the deposition of even delicate shells, unbroken, at any elevation reached by the ice, and that is substantially the view I set forth in 1874.

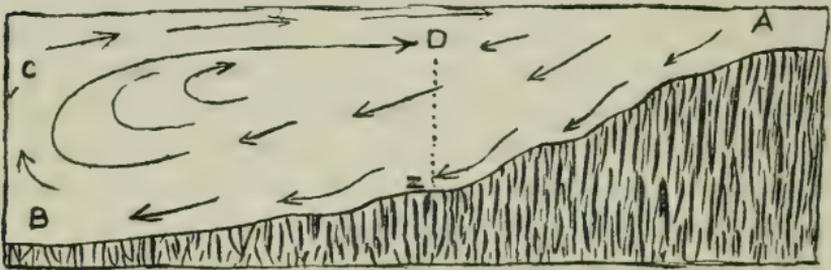


FIG. 8.

Diagram to illustrate the transportal of boulders in directions contrary to the flow of the sole of the Ice-Sheet, (see pp. 131, 139, ante.) Ice carrying boulders down hill and outwards from the centres of dispersal in a direction from A to B, is met at B by ice currents setting in contrary direction (in most force at higher levels). At B the opposing forces are balanced, and the direction of least resistance is then mainly upward. Arrived at higher levels, the local current becomes more and more affected by the influence of the currents setting inland, and the ice then moves with its freight of mixed local and extraneous detritus in the direction C, D. On the melting of the ice the sediment dispersed throughout it is deposited on the rock surface below: the boulders both of local and extraneous origin, between D and Z, for example, being sedimented at Z. [It should be observed that in hardly any of the cases cited did the direction of movement of the outflowing current lie diametrically opposite to that of the current opposing it. The curve of transportal was probably hardly ever entirely in the same plane.]

IV.—THE RESULTS OF ICE ACTION UPON THE SURFACE.

Quantity of rock removed during the Glacial Period.—It has been already incidentally mentioned that the total quantity of certain kinds of rock traceable in the form of boulders in the glacial deposits of the North of England is enormous, considering the superficial area presented by the parent masses *in situ*. The quantity of Shap Granite in the form of boulders removed by ice from the parent rock has long been a subject of remark, seeing that the superficial area of the rock *in situ* does not much exceed a square mile. Equally good illustrations of the point under consideration are supplied by the boulders derived from the St. John's Quartz Felsite, the Armbboth Dyke, the Mardale Gabbro, and others already mentioned above. The tough and durable nature of the harder porphyrites and "ashes" of the Borradale volcanic series has also, in their case, favoured their survival through a prolonged course of rough treatment, and the boulders of these rocks consequently occur in overwhelming proportions in the drifts of particular areas in the north. These last mentioned rocks occupy a superficial extent of many square miles; but this has less to do with their wide dispersal in the drift than has their extreme durability under the action of mechanical erosion. This point is brought into striking contrast by a comparison of the proportion these boulders bear to those of Skidda Slate. *In situ* both rocks occupy, roughly speaking, about the same superficial extent. Moreover, the glacial agent that affected the one, must have affected the other to at least an equal extent. Yet in the drifts resulting from this action, recognisable fragments of Skidda Slate, as a rule, are to be found only in very small quantities; and are then generally confined to the immediate neighbourhood of the parent rock. Hardly any, or perhaps none at all, have survived the rough treatment involved in a transportal to a distance of only a few miles. On the other hand, boulders of the volcanic rocks from the same area have been transported at least as far south as Cheshire, where I have met with many well-known old friends from the north.

They occur also, according to Professor Green, on the east side of the Derbyshire hills; and they may be found farther from the parent source even than that.

The inference to be drawn from these facts is that, under the various forms of glacial action affecting the surface, only the toughest and most durable rocks survived; all the rocks of lesser toughness being sooner or later crushed and ground into small fragments. Or, to put the same statement in to another form, it is those rocks whose boulders have travelled farthest in the drift that have suffered least under glacial action at home. The tougher the rock, the farther its boulders have gone, and the more it has withstood wear and tear *in situ*: the more readily it goes to pieces under the action of mechanical abrasion, the less chance is there of any of its boulders surviving a lengthy transportal in the ice, and the more the parent mass has suffered.

This relation between the capacity of resistance of any given rock to mechanical erosion and the development of surface features, plays a much more important part in the sculpturing of rock surfaces than many are disposed, even yet, to admit. In the Yorkshire dales, especially, its effects are very striking and suggestive; because large areas there consist chiefly of limestone, and the action of chemical forces comes prominently into play in its effects upon surface features. Taking one of these districts as an example, say Upper Wensleydale and the dales branching out of it, we find the whole of the valleys carved out of a great pile of Carboniferous rocks of marine origin, lying sheet upon sheet of rock to a thickness of two thousand feet or more, and still remaining in very nearly the same position of horizontality that they had when originally spread out upon the old sea bottoms. These rocks consist of a great number of alternations of beds of limestone, sandstone, and shale: the limestone beds, as I have before pointed out, nearly always being overlaid by shales; and being succeeded below by beds of sandstone. The relative proportion of these three kinds of rock to each other may be roughly set down as limestone two, sandstone three, shale five. That is to say, there is more than twice as much shale as there is limestone. But if we

compare the relative proportion borne to each other by these rocks as they occur in the local drifts, we find them about as :—limestone four, sandstone four, and shale only two ; the proportion of shale diminishing, and that of limestone increasing, the farther we trace the boulders from their parent sources. It is therefore evident that whatever was the agent that transported the materials of the drift, that agent certainly crushed the shale into mud first, reduced the sandstone to sand at a slower rate, while the limestone boulders were suffered to travel great distances with a minimum reduction of their bulk. It may here be mentioned again that the drifts of these dales contain a percentage of clay small out of all proportion to that of the argillaceous members of the local rocks. Indeed large masses of drift occur here with hardly any clay in them at all. (See *Quart. Journ. Geol. Soc.*, xxxi. p. 97.) What became of the crushed shale was to me a long time a mystery, until I found my colleague Mr. Clement Reid wondering whence had come all the clay that he had been mapping as boulder clay on the chalk wolds of Yorkshire. It was then evident that, by some means or other, much of the clay that was missing in north-west Yorkshire had found its way to the south-eastern parts of the same county, and formed the matrix of the drifts there.

It is, then, clear, that under glacial erosion the relative destructibility of these rocks stands as—shale, sandstone, limestone ; the limestone being, under this kind of agency, the last to be reduced. Now let us compare the relative degrees of resistance to subaerial waste presented by these rocks *in situ*, and note the result.

[Under the action of the weather each of these kinds of rock behaves differently. Where the outcrop is of shale, and at the same time forms a steep bank alongside a stream, the numerous divisional planes help to make the rock go to pieces in a very short time ; so that, in such a case, whatever the overlying beds may be like, the bank is not long in being cut back. But where the outcrop forms a gentle slope out of the way of constantly-running water, such shale as is not more than usually sandy, decomposes into a tough and nearly impervious clay, much of which remains at the surface, and thereby greatly helps to lessen

the waste of the beds beneath. Some good examples of the different rate of weathering of the same bed of shale where exposed to the direct action of running water, and where affected only by weathering, are found about the waterfalls or "fosses" in the Dale District. Under the waterfall the shales that there underlie the sandstone, as this does the limestone of the foss, are kept in the condition most favourable for their rapid disintegration, so they are quickly cut back beneath the harder beds that form the edge of the fall. But at the outer end of the ravine caused by the gradual recession of the waterfall, subaerial denudation has accomplished so little, notwithstanding that a rapidly-flowing stream is at hand, that the difference between the rate of recession of the foss and that of the sides of its ravine in one case is about as forty to three. In other words, while that waterfall has cut back forty feet each cliff it has left has receded only eighteen inches.

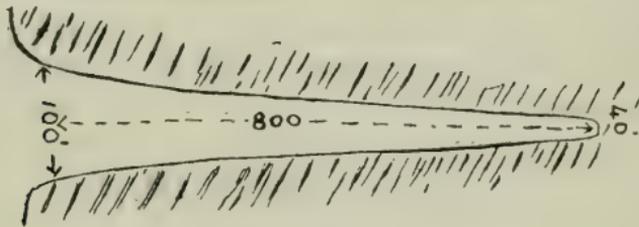


FIG. 9.

Diagram to illustrate the ratio between the rate of formation of a ravine under the action of a waterfall, and that of the widening of its sides, where these are not exposed to the direct action of falling water. The figures given in the diagram are, in round numbers, those taken at Moasdale Force in Wensleydale.

The particular instance here referred to is, doubtless, an extreme case where the beds overlying the shale are more than usually durable; but it serves to prove that even where there is a rapid stream flowing, the denudation of shale does not go on very rapidly unless the stream actually flows close to the outcrop. Where limestone is the rock directly overlying the shale, this last is usually cut back much faster, because the surface water finds an easy passage into it through the weathered joints of the harder bed above. In such cases the difference between the width of the outer end of the ravine and the width close to the fall, compared

with the distance between the two points thus measured, gives very nearly the ratio between the rate of denudation of any given rock on the one hand by the direct action of streams, and on the other by that of ordinary weathering.

If then, so little denudation of a rock as easily worn as shale has been accomplished in Post-Glacial times by the rapid streams of the Dale District, where these streams are absent we should be prepared to find that the rate of denudation is so slow as to produce results that are hardly perceptible. Amongst many facts bearing upon this same point may be mentioned the occurrence of striæ dating from the climax of the glacial period, which are yet found in many places in this district within a few feet of the outcrop of a bed of shale, in the relative position shewn by B, in Figure 10. It is obvious in such a case that the horizontal distance between the ice markings and the base line of the shale marks the greatest distance that this can have been cut back in Post-Glacial times.

The thinner kinds of sandstone, especially where these are much split up by beds of shale, seem to go to pieces very readily; but upon the more compact, blocky, and little-jointed kinds, ordinary weathering seems able to produce very little effect. A very good example of this is to be found at Moasdale Foss in Wensleydale, Fig. 9, a waterfall caused by the superposition of a hard and blocky sandstone upon a bed of soft and thinly-laminated shale. The length of the ravine leading to the fall is nearly eight hundred feet, measured from its outer end to the fall itself; while the difference in the width of the ravine at the two points measured is only sixty feet. Yet in this instance a rapid stream flows within a few yards of the foot of the scars, which have thus receded only thirty feet on each side since the ravine was formed. There is good reason for thinking that the entire excavation has taken place in Post-Glacial times. The above remarks relative to the nearness of glacial striæ to the outcrop of higher beds of shale apply equally to the accompanying sandstones in similar positions; so that we get direct evidence that some of the sandstone scars have not been much altered in form since the close of the Glacial Period.

But for our present object the rock of most importance as regards its behaviour before subaerial agents is limestone. Not much more need be added to what has been already stated about the cutting back of a waterfall in this rock: where, however, limestone is found in thick beds, and is not very much split up by structural planes, it seems to recede not quite as fast as sandstone does under like conditions. But under the influence of the weather, limestone, as is well known, often wastes with great rapidity. Jukes's comparison of it to a glacier melting before the summer's sun conveys an excellent idea of the way this rock is dissolved and carried away in solution by the waters from the surface. The numerous structural planes that intersect every bed of limestone are developed, and rapidly widened, to a considerable depth from the surface, by the corrosive action of percolating waters, which thus easily find their way downwards and are enabled to attack rock at a lower level.

There seems reason for believing that the absolute rate of dissolution of limestone is far from slow, even when measured by years. In Kirkby Stephen Churchyard in 1871, there was an erect gravestone of ordinary Mountain Limestone that had then been put up about fifty years. As the stone was carved, at least the greater part of it must once have been smooth and unweathered; but when I saw it in 1871 there were encrinite stems, and bits of other fossils, left in relief to the extent of a tenth of an inch or more, the softer matrix having been removed by the rain that had fallen on the stone since its erection. One cannot be quite sure even that the highest parts of the fossils accurately represented the original dressed surface; but, assuming that they did so, we have in this instance proof that a smooth and quite-unweathered piece of limestone, standing in a position the least favourable for erosion by subaerial agencies, had been dissolved away at the rate of one inch in five hundred years.]*

The foregoing statements will, I think, suffice to shew that the relative degrees of destructibility of limestones, sandstones, and

* The paragraphs included between the square brackets are reprinted, without essential alteration, from the *Geol. Mag.* 1875, pp. 325-6.

shales under the action of the subaerial forces now attacking them, are very different from what they are under glacial erosion, and are clearly such as would, in the long run, end by leaving only the beds of sandstone at the surface to form all the features of prominence, except those situated on a very steep slope. Where the rocks lie in a nearly horizontal position, as they do over large areas in north-west Yorkshire and the parts of Westmorland adjoining, we ought, therefore, if it is true that the present surface features are due to the action of subaerial forces, to find nearly all the more prominent scars, and the terraces that extend inwards from their edges, almost exclusively of the particular rock that wastes at the slowest rate; that is to say, of sandstone. The shale would be expected to be cut back fastest, while the beds of limestone, being attacked by two sets of subaerial forces, instead of by but one set, would be dissolved clean out of sight all along its outcrop. Besides this we ought to find, all along the outcrop of the sandstones, a talus of blocks that had been dislodged from the scar by the undercutting of the softer beds beneath them.

So far as the particular district now referred to is concerned, we find the surface features as unlike this ideal as they could well be. There are, it is true, many scars, and here and there a few terraces, of sandstone; but all the more conspicuous features of this kind consist of the more-perishable limestone. Moreover, these limestone terraces occur in the greatest perfection at the very points where, according to the theory that they are due to the action of subaerial waste, they ought to be entirely absent. Another very important point in connection with these terraces cannot be too much insisted upon. This is, that in many cases, the terrace of limestone (see A. B. in fig. 10) consists of a shelf, or sheet, of limestone, of very nearly its full thickness, even at the very outer edge of the terrace. The limestone surface, as a whole, betrays hardly any evidence of having been longer exposed to the wasting influences of denudation at its outer edge A than it does at B along the line where the newer beds come on above it, which is presumably the part last exposed. This feature is rendered all the more striking by the fact that swallow holes are almost exclusively

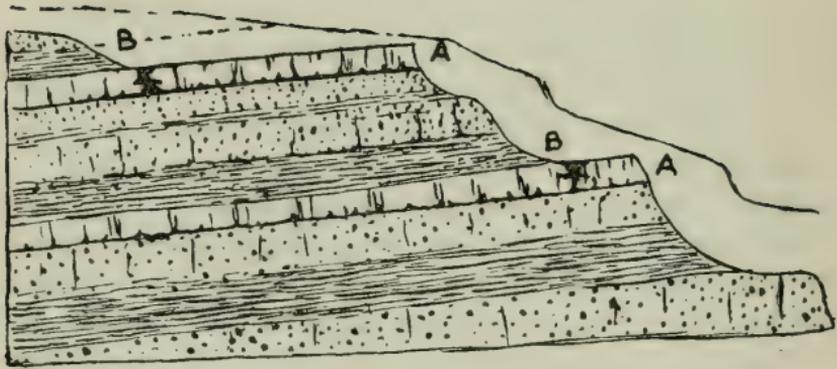


FIG. 10.

Diagram shewing the relation of the present contour of the limestone terraces and scars (A. B.) in Wensleydale to the contour they would assume under atmospheric denudation. The rock with the vertical shading represents limestone; that with the horizontal shading, shales; and the stippled part sandstones. The supposed preglacial contour is shewn by the dotted outline on the right. The inclination of the beds shewn is not intended to have any signification.

confined to the inner edge of the terrace, as shewn in Fig. 10, at B: swallow holes over the rest of the terrace being, as a rule, of much less common occurrence; and sometimes are absent almost entirely. Swallow holes, in such cases as the present, are, of course, due to the solvent action of surface waters flowing from the impervious beds that form the part of the hillside immediately above the outcrop of the limestone; and they are, almost necessarily, initiated along that line where the outcrop of the impervious shales comes on above that of the pervious and easily-dissolved limestone below. As the face of the impervious beds is weathered back, and new areas of limestone are exposed, the point where the water sinks into the limestone recedes *pari passu*; and so the swallow hole is enlarged and lengthened in the direction of the hill. Now, it must be obvious that, if the development of the limestone terrace is really due to the long-continued exposure of the rocks to the action of the weather, that there must have been a time when the shale overlying the limestone extended at least as far outward as the scar now forming the edge of the terrace, as shewn by the dotted line in the diagram; and as a consequence, swallow holes must have been formed there, just as they are now

being formed under similar conditions farther in. It is also clear that, with the recession of the shale under subaerial waste, the swallow holes would recede too, so that, if these conditions are represented here, we ought to find elongated swallow holes, or gullies, extending continuously across the whole width of outcrop of the limestone terrace. Moreover, seeing that vertical erosion of limestone by chemical agencies proceeds at so rapid a rate, there should be evidence of a considerable reduction in the thickness of the limestone at the outer edge of the terrace, commensurate with the amount of subaerial denudation of the shales resulting in their recession from this point to the point where they are now. It is hardly necessary to reiterate the statement that the facts, in the present case, are entirely opposed to any such view of the subaerial origin of the features in question. There are comparatively few swallow holes in these Wensleydale limestone terraces, except those along their inner margins ; all the rest of the limestone remaining almost intact ; or, what signs of weathering there are, affect the whole of the surface alike. The inference therefore is that every part of the whole terrace, from the scar at its outer edge, to the outcrop of the shale on its edge next the hill, has been exposed to denudation the same length of time. In other words, the weather has, manifestly, attacked the whole surface equally, and has left its marks just as distinctly upon the inner edge of the terrace as upon the parts, sometimes a hundred yards or more off, that now form the scar at its edge ; and the terrace, has, therefore, clearly not been formed by the weathering back of the shale.

Another point to notice, hardly less significant, is that hardly any of these limestone terraces shew more than traces of the vast accumulation of blocks of sandstone that must have been undermined and detached by the waste of the beds of shale beneath them. If a bed of shale lying between a bed of sandstone above and a bed of limestone beneath, be wasted back fifty or a hundred yards, it is obvious that some traces of the sandstone so undermined should be found at that spot. But this is not the case except to a very limited extent.

The real explanation of the phenomenon is that the features as they now stand are not due to the prolonged action of subaerial forces alone, but are due to the modification of old weathered surfaces by ice. The whole of the preglacially weathered rock, talus, swallow holes, weathered joints, and all, has been removed by long-continued glacial action, and the old preglacial configuration has been replaced by another of essentially different character. The ice of the glacial period, here, probably from first to last, flowed in a nearly uniform direction down the dales, and did not shift about and change its direction of flow as it did in many other parts. Under these circumstances we can readily understand how a mass of ice two thousand feet in thickness, grinding a surface formed of rocks presenting very variable degrees of resistance to mechanical erosion, would, in the course of the long interval representing the whole of the Glacial Period, cut its way farther into soft beds like shales than it would into the tougher and less-easily eroded limestones. It is well known that such minor differences in hardness as are presented by veins of barytes traversing a limestone, or even such as the difference in hardness between the matrix of a limestone and that of the fossils included in it, often results in corresponding inequalities of the surface where the rock has been glaciated. And where the difference in hardness is more marked, as it is in the case under notice, a corresponding difference in the resulting effects is what might have been expected.

In connection with the subject of glacial erosion there is one point that seems to have been overlooked by many of those who have written about the vertical limit of the ice-sheet. It has been assumed, seemingly upon insufficient grounds, that the rough and craggy form of the higher parts of such districts as are well-glaciated in their valleys is good proof that these higher parts were never overridden by the ice. But if the view above advanced be correct—that the ice removed from the low ground all the preglacially weathered parts of the rock—it follows that because the stay of the ice at the higher points was brief as compared with its stay lower down, much less of the high lying weathered rock was removed. Consequently, when the whole surface once more became exposed

to the action of subaerial agencies, the sound rock in the low ground would be long in being affected, even where it was not covered by drift, while at the higher points subaerial denudation would soon remove the slightly-glaciated surface and replace it by surface features of a different kind, so these parts would eventually appear to have been always out of the reach of the ice. Thus it is that in the Dale District the higher lying rock surfaces show more decided traces of the action of the weather than are to be found nearer the bottoms of the valleys. The thorough glaciation of the low ground caused all the preglacially weathered rock—swallow holes, widened joints, and all—to be removed; whilst at higher levels even a considerable portion of the preglacially weathered rock was left. In the one case the weather has had to begin its work anew; in the other it resumed work almost where it ceased. The same remarks will of course apply equally to those parts of Mid and Southern England where the presence of glacial drift marks the former extension of the ice-sheet. When compared with its duration in the Northern parts of England, the stay of the ice-sheet in the South was probably brief. Hence there would be less modification of the rock surface than was effected where the ice had a longer stay. Consequently, the slight amount of erosion that the rocks underwent would favour the rapid replacement of an ice-worn surface by one that to all appearance had been produced solely by atmospheric causes.

When we consider the immense number of the boulders of almost every rock of marked lithological character that have been dispersed far and wide from outcrops of small extent, it becomes evident that other rocks that, as boulders, are not so easily followed, have, under a like amount of glaciation, suffered denudation to as great an extent. The enormous quantity of rock material removed in the shape of boulders from the Shap Granite at Wastdale Crag has been already more than once referred to; and this, taken with the other instances mentioned, will suffice to prove this point. It would therefore necessarily follow that what is known to be true of any particular rocks like those mentioned, must be equally true, *cæteris paribus*, of other rocks associated with it. And as the glaci-

ation of the upper part of the Yorkshire Dales has been as intense as the glaciation of the country around Shap, it seems a fair inference that the quantity of rock removed from the surface of the lower lying Dale rocks must be at least equal, area for area, to what was removed from Wastdale Crag. Hence we are led to the conclusion that the ice-sheet effected some very important modifications of form in the old preglacial valleys. Where the ice remained for long periods, there can hardly be any doubt that many of the valleys were both deepened and widened, in some instances to a considerable extent ; and also that the peculiar mode of action of the ice tended everywhere to modify the pre-existing form of the surface, and even to replace part of this by sculpturing that is very different from anything that, under existing physical conditions, could possibly be produced by any kind of Subaerial Erosion.

The remarkable development of the limestone terraces in Wensleydale is almost certainly due to the fact that the movements of the ice, all through the Glacial Period, were mainly in the same direction, and did not veer about to anything like the same extent as the ice certainly did elsewhere. While it was partly effacing some of its earlier work in Edenside and Wensleydale, it continued to carry its action still further, and to intensify effects already accomplished.

In the original papers further arguments bearing upon the same subject were discussed in considerable detail ; and an attempt was made to show that the present form of the rock surface in this, and in the adjoining areas, was due to extensive modifications of old features of subaerial origin by the prolonged action of glacial erosion.

Among the features impressed upon the rock surface by these causes the writer is still, as much as ever, disposed to include those remarkable semicircular hollows so common in glaciated mountain areas, and known under the names of Coums, Corries, or Cirques. In the original articles special reference is made to the origin of some most remarkable phenomena of this nature occurring near Melmerby, which illustrate in a very striking manner, the more characteristic of these singular features.

V.—POST GLACIAL DENUDATION.

In the same papers many facts were brought forward to shew that the amount of denudation accomplished in post glacial times is in many respects strikingly small. The insignificant quantity of material deposited by the action of streams in our lakes of glacial origin; the very limited vertical erosion of the river channels; the presence, in very many instances, of glacial striæ at the foot of, or even on the faces of, some of the precipitous scars of the north; the generally-unweathered condition of large areas of moutonned rock; the well defined form of the eskers, and of the moraines; the small quantity of weathered material strewing the slopes below very many of the rock features of the north—all seem to point to the conclusion that the close of the glacial period was very much nearer to our own times than we have been, as a rule, accustomed to regard it. Measuring the effects of post glacial erosion by the known rates of erosion now in action, and making due allowance for the fact that the low lying rock surfaces at the close of the Glacial Period consisted of sound and unweathered rock, it seems to me that a period of 20,000 years since the close of that period is amply sufficient to account for all the denudation that can be demonstrated to have been accomplished in Post Glacial times.



