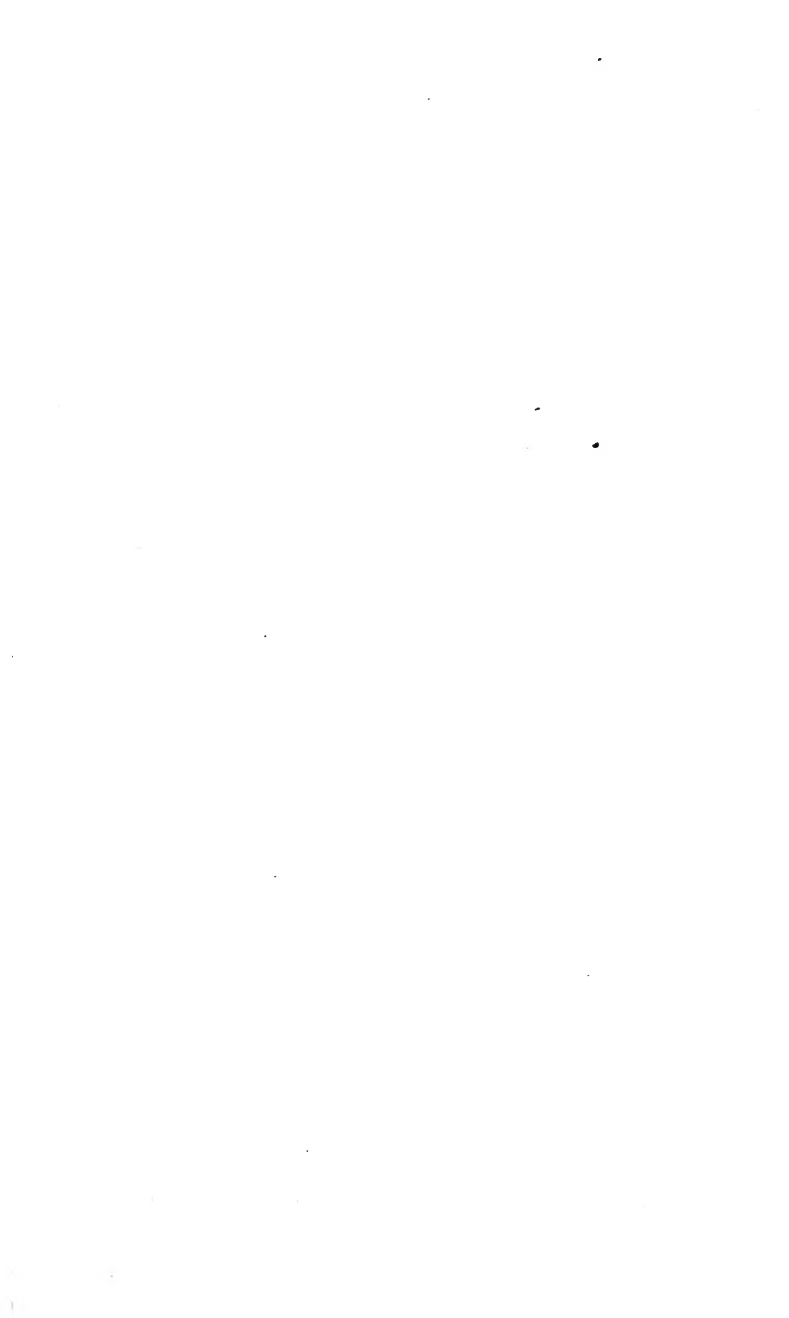


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3 JUN. 92

TRANSACTIONS

OF THE

Cumberland and Westmorland Association

FOR THE

*ADVANCEMENT OF LITERATURE
AND SCIENCE,*

No. XIII.—1887-88.

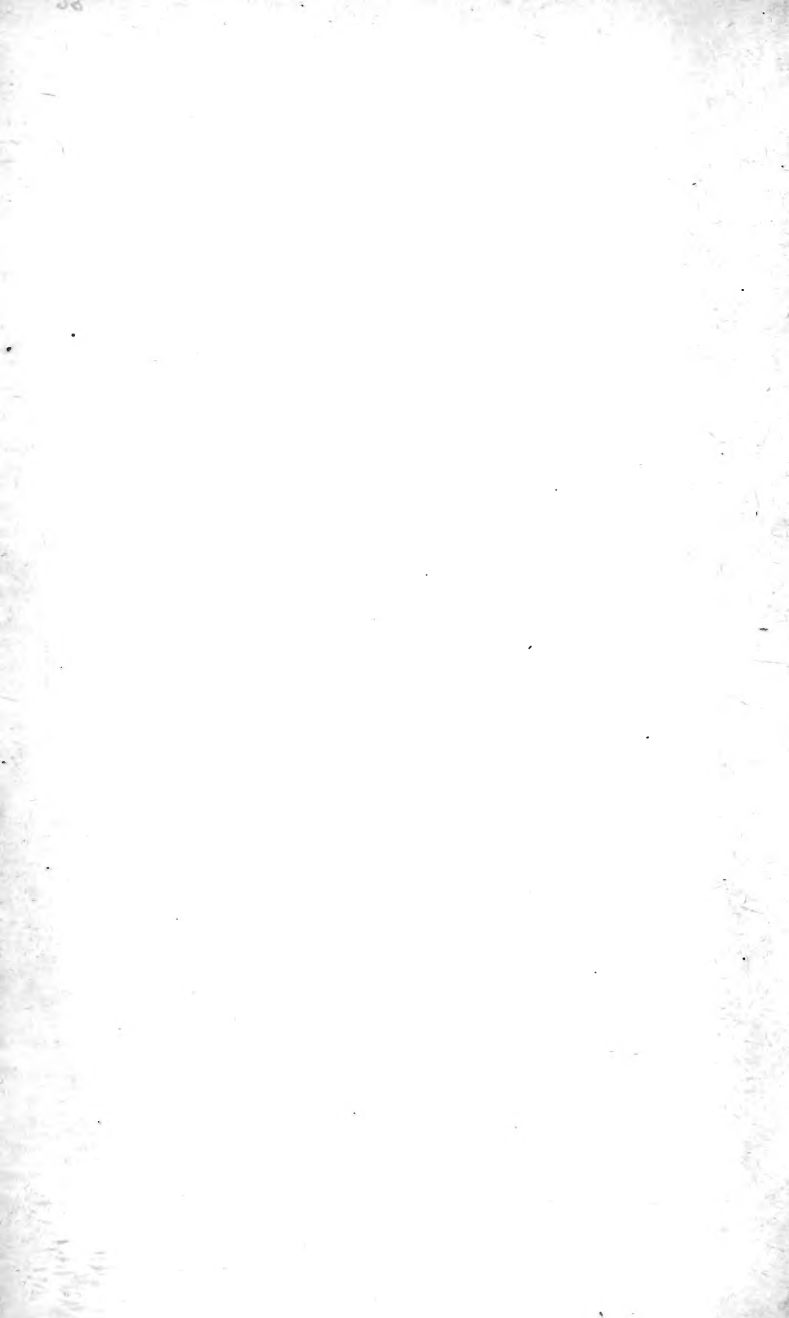
EDITED BY J. G. GOODCHILD, F.G.S., F.Z.S.,

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

PRICE TO MEMBERS, ONE SHILLING,
NON-MEMBERS, TWO SHILLINGS AND SIXPENCE.



CARLISLE:
PRINTED BY G. & T. COWARD, THE WORDSWORTH PRESS.
1888.



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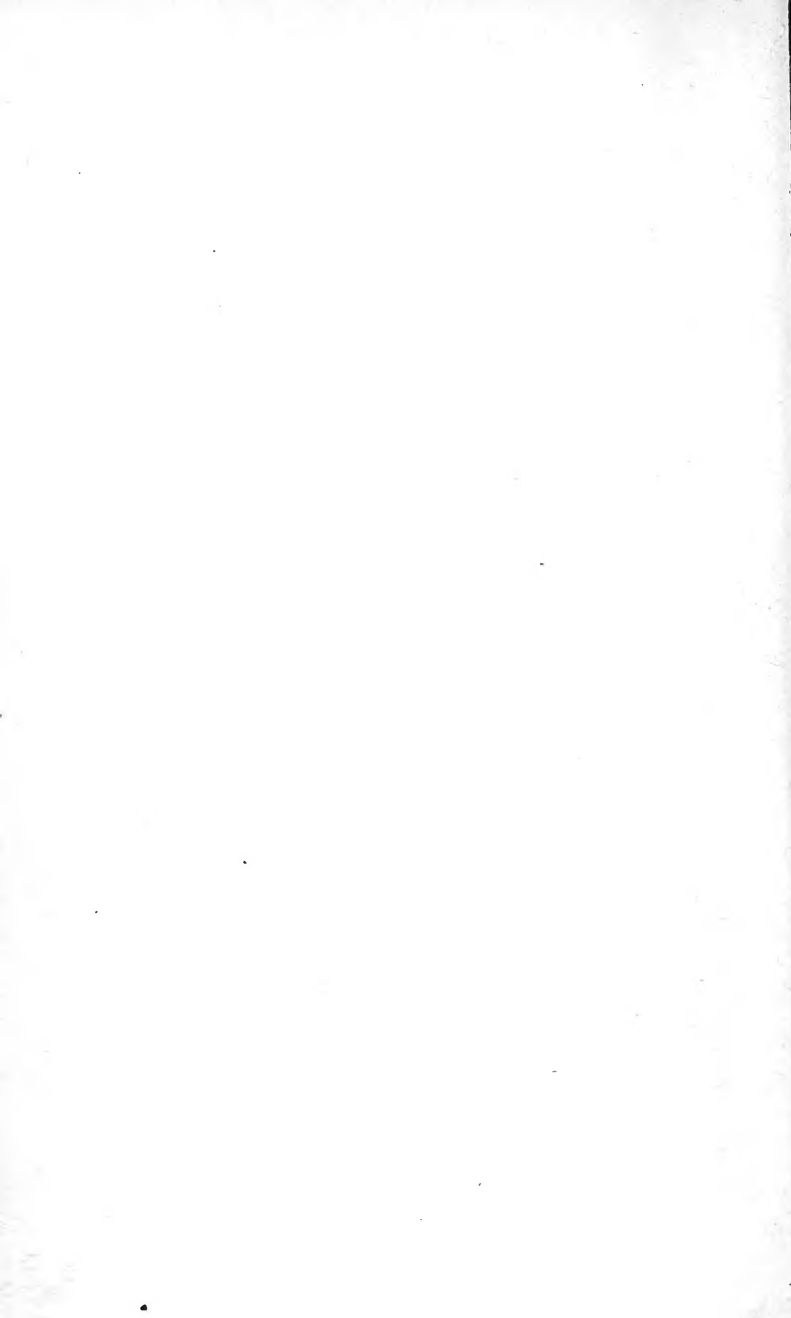
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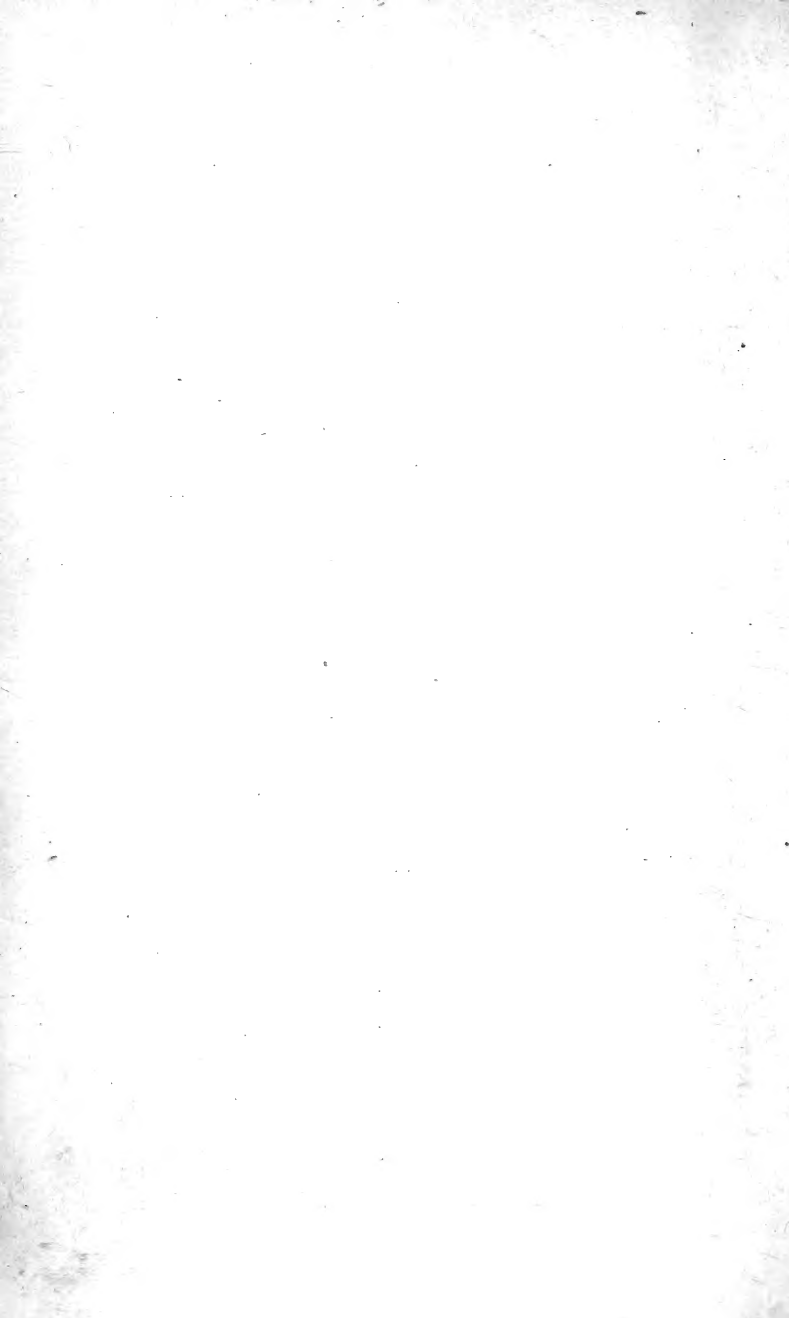
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CONTENTS.

	Page
RULES	v.
LIST OF OFFICERS	viii.
ADDRESSES OF HONORARY SECRETARIES OF THE SEVERAL LOCAL SOCIETIES	ix.
MEMORANDA FOR MEMBERS	ix.
LIST OF ASSOCIATION MEMBERS	x.
REPORTS FROM THE ASSOCIATED SOCIETIES	xi.
REPORT OF ASSOCIATION SECRETARY	xxiii.
TREASURER'S ACCOUNT	xxx.
PRESIDENT'S ADDRESS (R. A. ALLISON, Esq., M.P.) at Longtown	77
PAPERS COMMUNICATED TO THE SOCIETIES, AND SELECTED BY THE ASSOCIATION COUNCIL FOR PUBLICATION :—	
“The ‘Giant’s Thumb,’ Penrith Parish Churchyard.” By GEORGE WATSON (Penrith)	1
“Was St. Patrick a Cumbrian?” By Rev. JOHN I. CUMMINS, O.S.B. (Maryport)	7
“Ornithological Record for Cumberland, January, 1887—June, 1888.” By H. A. MACPHERSON, M.A., M.B.O.U., Carlisle, and W. DUCKWORTH, Ulverston	25
“Some of the Old Families in the Parish of Crosthwaite : The Brownriggs of Ormathwaite, &c.” By J. FISHER CROSTHWAITE, F.S.A. (Keswick)	31
“The Birds of our Marshes.” By J. N. ROBINSON, of Cargo (Carlisle)	47
“Report on Pallas Sand-grouse (<i>Syrrhaptes paradoxus</i>) in the North-West of England.” By H. A. MACPHERSON, M.B.O.U.	59
“The Physical History of Greystoke Park and the Valley of the Petteril.” By J. G. GOODCHILD, H.M. Geol. Survey, F.G.S.	89
“The Old Lakes of Edenside.” By J. G. GOODCHILD, H.M. Geol. Survey, F.G.S.	105
“Additional Notes on Pallas Sand-grouse.” H. A. MACPHERSON	114



RULES

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. Such members shall be termed “Association Members.”

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, Treasurer, an Editor, a Librarian, and of ordinary members, two to be elected by each affiliated Society. The President, Secretary, Treasurer, Editor, and Librarian shall be elected annually at the Annual Meeting, and shall be capable of re-election. The Recorders shall be ex-officio members of the Council.

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.—Association Members pay the sum of 6/- annually, or they may compound for their subscription for life by a payment of £3 3s. od. in one sum.

12.—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.

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

14.—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 Fourteenth ANNUAL MEETING will be held in the Summer of 1889, 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.

OFFICERS FOR THE SESSION 1888-89.

President.

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Past-Presidents.

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 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.
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Rev. A. RAWSON	Windermere.

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J. B. BAILEY, Esq., Eaglesfield Street, Maryport.

Treasurer.

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Librarian.

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Delegate to British Association.

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 J. NORMAN ROBINSON, Esq., Croft House, Cargo, Carlisle.

Botanical Recorders.

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

ADDRESSES OF HONORARY SECRETARIES OF THE SEVERAL LOCAL SOCIETIES.

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Maryport	E. W. LIGHTFOOT, Esq., Holme Lea, Maryport.
Longtown	J. G. TOPPIN, Esq., Graham Street, Longtown.
Carlisle ...	...	J. SINCLAIR, Esq., 6 Hawick Street, Carlisle.
Ambleside...	...	J. BENTLEY, Esq., Ambleside.
Silloth ...	...	H. L. BARKER, Esq., Silloth.
Brampton ...	...	I. B. HODGSON, Esq., Brampton.
Penrith ...	...	H. M'LEAN WILSON, Esq., M.B., C.M., Portland Place, Penrith.
Windermere	}	Col. W. C. MACDOUGALL. F. BARTON, Esq., 8 Biskey Howe-Terr., Windermere.

MEMORANDA FOR MEMBERS, &c.

SUBSCRIPTIONS ARE DUE—

Association Members ...	...	January 1st.
For Transactions ...	...	February 1st.
Lecturer's Fee ...	...	February 1st.
Capitation Fee ...	...	April 1st.

PAPERS INTENDED FOR PUBLICATION to be sent not later than *April 20th*, to J. G. GOODCHILD, Esq., 28 Jermyn Street, London.

PRICE OF TRANSACTIONS—

Current Number. Members, 1/- for the first copy, 2/- each for others; Non-members, 2/6.

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Twenty copies, free. Extra copies at a small rate, if notice of the number required be given to the Printer when the proof is returned. There is a large stock of Authors' Copies in hand. The Council would be glad to reduce this stock. Application to be made to the *Hon. Association Secretary*.

CIRCULATING LIBRARY—

Full particulars will be sent to each Society when arrangements are completed.

NOTICES RELATING TO ZOOLOGY to be sent to Rev. H. A. MACPHERSON, M.A., 20 Cecil Street, Carlisle.

NOTICES RELATING TO BOTANY to be sent to WM. HODGSON, Esq., A.L.S., Flimby, Maryport.

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H. J. WEBB, Esq., Ph.D., B.Sc., The Agricultural College,
Aspatria.

Reports from the Associated Societies.

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19TH SESSION, 1887-88.

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<i>Secretary</i>	J. BROATCH.
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EDWIN JACKSON.

Rev. W. COLVILLE.
J. FISHER CROSTHWAITTE, F.S.A.
THOMAS SMITH.

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G. BLACK, M.B.

Hon. Curators of the Museum.

JOHN BIRKETT.

J. POSTLETHWAITE, F.G.S.

The following MEETINGS were held during the Session :

ORDINARY MEETINGS.

1887.

Oct. 31.—PRESIDENT'S ADDRESS.—“Volcanoes.”

Nov. 28.—Mr. J. FISHER CROSTHWAITTE, F.S.A.—“On the Ancient Free School of Crosthwaite.”

Dec. 12.—Mr. THOS. SMITH.—Cowper—“Winter Evening.”

1888.

Jan. 30.—Rev. A. R. GODDARD, B.A.—“Pompeii—its Ruin and Recovery.”

Feb. 6.—Mr. H. SLADE WILSON.—“Some English Dramatic Characters.”

Feb. 13.—Mr. W. R. FITZPATRICK.—“Mary Queen of Scots.”

Mar. 12.—Mr. T. E. HIGHTON.—“Russia in Asia.”

Mar. 19.—Mr. W. WOODING NELSON.—“Who Wrote Shakespeare?”

ANNUAL MEETING.

LECTURES.

1887.

Nov. 7.—Mr. EDWIN JACKSON.—“H. M. Stanley’s African Travels and Work.”

Nov. 21.—Rev. H. D. RAWNSLEY, M.A.—“Some Royal Mummies.”

Dec. 5.—Rev. J. SHARPE OSTLE, M.A.—“Calverley.”

Dec. 19.—Rev. C. J. D. FORBES, M.A.—“Life and Times of Anselm.”

1888.

Jan. 23.—Mr. W. H. GOLDING.—“Cloistered Cathedrals and Ancient Abbeys,” illustrated by Oxyhydrogen Apparatus.

Feb. 20.—Rev. BROOKE LAMBERT, M.A.—“More’s Utopia.”

Mar. 5.—Mr. P. T. FREEMAN.—Concert Lecture—“The Pianoforte and its Music from the Earliest Times,” with illustrations.

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ASSEMBLY HALL, HIGH STREET.

12TH SESSION, 1887-88.

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<i>Hon. Secretary</i>		D. IRVING.

The following *LECTURES* were given during the Session :

1887.

Nov. 1.—CONVERSAZIONE.

Nov. 15.—Rev. J. J. CUMMINS.—“St. Patrick a Cumbrian.”

Nov. 29.—J. H. PARK, Esq.—“The Sandwich Islands and their people, as seen in 1886.”

Dec. 13.—Rev. C. H. GEM, B.A.—“Shakespeare.”

Dec. 22.—G. H. BAILEY, D.Sc., Ph.D.—“Coal Mines and Explosions,” with Experiments.

1888.

Jan. 13.—Prof. SÆLEY, F.R.S., F.G.S.—“The Work of Water in shaping Land,” illustrated by Lime Light Lantern.

Jan. 25.—Rev. S. HEBERT, M.A.—“Pharaoh and his Mummy,” illustrated by Diagrams.

Feb. 8.—W. E. ROBERTSON, Esq.—“Reminiscences of a Tour in South Africa.”

Feb. 22.—J. CRERAR, Esq., M.R.C.P.E.—“The Circulation of the Blood,” illustrated by Diagrams.

Mar. 7.—Dr. H. J. WEBB, Agricultural College, Aspatria.—“Light, and its Work in Nature,” with Experiments.

Mar. 28.—ANNUAL MEETING.

LONGTOWN LITERARY AND SCIENTIFIC SOCIETY.

11TH SESSION, 1887-8.

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The following MEETINGS were held during the Session :—

1887.

- Nov. 1—R. A. ALLISON, Esq., M.P.—“Edmund Burke.”
 Nov. 8—Dr. GRANT.—“Christianity in Britain before the coming of Augustine.” Illustrated by Magic Lantern.
 Nov. 15—Mr. WILKIE.—“James Hogg, the Ettrick Shepherd.”
 Nov. 22—J. H. PARK, Esq.—“The Sandwich Islands.”
 Nov. 29—Rev. J. R. GIBSON.—“Books, and how to Read them.”
 Dec. 6—Debate: “Is Reason confined to Man?” *Aff.* Mr. J. WILSON.
 Neg. Dr. MC.LACHLAN.
 Dec. 13—Rev. J. A. SMITH.—“A Trip Round the World.” Illustrated by Lime-light Lantern.
 Dec. 23—WM. HODGSON, Esq., A.L.S.—“Sea-side Botany.”
 Dec. 27—Special Arrangements.

1888.

- Jan. 3—Special Arrangements.
 Jan. 10—Debate: “Has Machinery benefited the Working Classes?”
 Jan. 17—Rev. S. FALLE.—“Epitaphs.”
 Jan. 24—Rev. H. T. BULKELEY.—“Robert Browning.”
 Jan. 31—Mr. JOHN WILSON.—“The Limits of Science.”
 Feb. 7—Rev. D. THOMAS.—“Reading.”
 Feb. 14—Dr. MC.LACHLAN.—“The Fools of Shakespeare.”
 Feb. 21—Readings, &c.
 Feb. 28—Mr. J. G. TOPPIN.—“Ants.”
 Mar. 13—Mr. WILKIE.—Reading from Dickens.
 Mar. 20—Shakespearian night.
 Mar. 27—Business of the Society, Election of Officers, &c.

CARLISLE SCIENTIFIC SOCIETY AND FIELD
NATURALIST CLUB.

11TH SESSION, 1887-88.

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Dr. MACLAREN.		Mr. R. M. HILL.
Dr. BARNES.		Dr. LEDIARD.
Mr. T. T. SCOTT.		Mr. J. HARRISON.

The following LECTURES, &c., have been given during the Session :—
1887.

- Nov. 10—R. A. ALLISON, Esq., M.P.—“Scenes and Anecdotes from the Past History of the House of Commons.”
Nov. 17—JOHN SINCLAIR.—“Our Dalesfolk,” and “Wit of Cumberland.”
Dec. 1—Rev. C. H. GEM.—“A Poet’s View of Art and Faith.”
Dec. 15—Mr. DAVID BURNS, C.E., F.G.S.—“The Tea Kettle.”
Dec. 22—Mr. WILLIAM HODGSON, A.L.S.—“Seaside Botany, St. Bees to Bowness,” Part 3rd.

1888.

- Jan. 13—Professor SEELEY.—“The Race Characters of the English People.”
Jan. 26—J. A. WHEATLEY, Esq.—“Diamonds.”
Feb. 9—Mr. GEO. DAWSON and Mr. J. ROBINSON.—“The Birds of our Marshes.”

Mar. 8—Rev. H. WHITEHEAD.—“George Fox the Quaker.”

Mar. 22—R. S. FERGUSON, Esq., M.A., F.S.A.—“The Siege of Carlisle in 1644-5.”

Apl. 5—Mr. WILLIAM THOMPSON,—“Pond Life.”

Three Field-Days have been held during the Season, and about one hundred copies of the *Transactions* have been distributed free to the Members.

AMBLESIDE AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

11TH SESSION, 1887-88.

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Vice-Presidents.

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Committee.

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--	--	---

The following MEETINGS were held during the Session :—

1887.

Oct. 18—J. WATSON, Esq.—“Caves and Cave Contents.”

Oct. 25—W. G. COLLINGWOOD, Esq., M.A.—“Freaks of Coniston Quartz.”

Nov. 1—J. SEVERS, Esq.—“The Microscope.”

- Nov. 15—Rev. H. D. RAWNSLEY, M.A.—“On some Royal Mummies.”
 Nov. 29—G. E. LOWTHIAN, Esq.—“Combustion.” Illustrated by Experiments.
 Dec. 13—Rev. J. N. HOARE, M.A., F.R.H.S.—“Buddhism.”
 1888.
 Jan. 10—Professor SEELEY, F.R.S., F.G.S.—“The Race Characters of the English People.”
 Jan. 24—W. H. GOLDING, Esq.—“The Breath of Life.” Illustrated by Experiments.
 Feb. 7—H. H. PEARSE, Esq., War Correspondent to *The Daily News*.—“A Night March, and a Fight for Water.”
 Feb. 21—A. H. RAIKES, Esq., M.A.—“An ancient path, a forgotten battle, a lover’s leap, a clan’s feud, a poet’s vision, a chief’s revenge, may be read in these Celtic names, when rightly interpreted.”
 Mar. 6—T. MACKERETH, Esq., F.R.A.S., F.R. Met. Soc.—“On the Stars.”
 Mar. 20—W. R. FITZPATRICK, Esq.—“Mary Queen of Scots.”
 Mar. 27—Annual Meeting—Election of Officers.

SILLOTH AND HOLME CULTRAM LITERARY
 AND SCIENTIFIC SOCIETY.

9TH SESSION, 1887-88.

President Rev. S. HEBERT, M.A.

Vice-Presidents.

J. M. PAULL, F.G.S.

G. T. CARR.

Committee.

H. L. BARKER.
 W. CRABB.
 J. GRAHAM.
 JOHN GLAISTER.

JOSEPH GLAISTER.
 W. M. HUDSON.
 Rev. H. M. TODD, M.A.
 W. F. WILSON, J.P.

Rev. W. A. WRIGLEY.

Hon. Treasurer J. STRONACH.

Hon. Secretary J. B. BINKS.

The following *LECTURES* were given during the Session:—

1887.
 Oct. 12.—Rev. S. HEBERT, M.A.—“Pharaoh and his Mummy,” illustrated by Diagrams.
 Oct. 26.—R. J. BAILLIE, F.R.A.S.—“Earthquakes and Volcanoes.”
 Nov. 9.—J. M. PAULL, F.G.S.—“Man.”
 Nov. 23.—Dr. KNIGHT.—“The Circulation of the Blood.”
 Dec. 7.—J. B. BAILEY.—“Shakespeare,” a suggestive Sketch.
 Dec. 14.—Rev. C. H. GEM, B.A.—“Milton.”
1888.
 Jan. 11.—R. Mc.MILLAN.—“The First Glassmakers, the History of a Sponge Family.”
 Jan. 26.—Dr. H. J. WEBB.—“The Water we Drink,” illustrated by Experiments.
 Feb. 8.—J. A. WHEATLEY.—“Diamonds and Precious Stones.”
 Feb. 22.—Rev. H. M. TODD, M.A.—“Norway and Sweden.”
 Mar. 21.—Dr. MITCHELL.—“The Brain and Nerves.”

OFFICERS FOR 1888-89. *President*—J. M. Paull, Esq., F.G.S.
Vice-Presidents—Rev. S. Hebert, M.A., and John Graham. *Committee*—G. T. Carr, W. Crabb, T. Johnston, John Glaister, Joseph Glaister, W. M. Hudson, Rev. H. M. Todd, M.A., W. F. Wilson, J.P., Rev. W. A. Wrigley. *Hon. Treasurer*—John Stronach. *Hon. Secretary*—H. L. Barker. *Delegates to Annual Meeting*—Thomas Johnston and H. L. Barker.

BRAMPTON LITERARY AND FIELD NATURALIST SOCIETY.

SESSION, 1887-88.

President G. J. JOHNSON, Esq.

Vice-Presidents.

Rev. S. FALLE.

Rev. H. J. BULKELEY.

Treasurer

Mr. J. B. LEE.

Hon. Secretary

Mr. ISAAC B. HODGSON.

Committee.

Mr. J. FARRER.	Mrs. H. Y. THOMPSON.
Mr. J. NIXON.	Miss BELL
Mr. RIGG.	Miss EMMA LEE.
Mr. JAMES STEELE.	Miss MACQUEEN.
Dr. THOMPSON.	Miss THOM.

The following MEETINGS were held during the Session:—

1887.

Oct. 11.—Transaction of the ANNUAL BUSINESS, followed by Music and Readings.

Oct. 18.—Mr. F. HARRISON.—“Old Cumberland Customs.”

Nov. 1.—Mr. R. J. BAILLIE, F.R.A.S.—“Meteors and Comets,” illustrated by Diagrams.

Nov. 15.—Mr. JOHN BIRKBECK.—“The Alps and Vesuvius,” illustrated with Views shown by the Lime Light.

Nov. 29.—Dr. MACPHAIL.—“Witchcraft and Modern Views of Insanity.”

Dec. 13.—Dr. THOMPSON.—“Some Curiosities of Science.”

Dec. 20.—Rev. S. FALLE.—“Epitaphs.”

1888.

Jan. 10.—Reading by MEMBERS.—“She Stoops to Conquer.”

Jan. 24.—Debate: “Free *versus* Fair Trade.”

Feb. 7.—Rev. H. J. BULKELEY.—“Eminent Persons who died in 1887.”

Feb. 21.—Rev. PERCY LEE.—“What I saw in Egypt and the Holy Land.”

Mar. 6.—Mr. R. J. WHITWELL.—“Dictionaries.”

Mar. 20.—Rev. J. N. HOARE.—“Ancient Egypt.”

There are ninety-five members, and the attendance at the Lectures has been well sustained.

PENRITH AND DISTRICT LITERARY AND SCIENTIFIC SOCIETY.

7TH SESSION, 1887-88.

President Rev. H. WHITEHEAD, M.A.

Vice-Presidents.

GEORGE WATSON. | Rev. E. CHAPMAN, M.A.

Secretary H. MCLEAN WILSON, M.B.

Treasurer J. B. SHAWYER

Delegates.

Major W. B. ARNISON. | GEORGE WATSON.

Committee.

Rev. W. M. SCHNIBBEN.	|	C. H. GRAHAM.
J. THOMPSON.	|	T. LESTER.
F. KING.	|	W. BELL.
E. H. REED, M.A.	|	Rev. W. MARSH, M.A.
J. SIMPSON YEATES.	|	W. B. ARNISON.

Curator of Museum CHARLES SMITH

Librarian J. STUART

The following Lectures and Papers have been delivered during the Winter:—

1887.

- Nov. 3—Annual Meeting and Conversazione
 Nov. 17—Rev. H. WHITEHEAD.—“Hall Marks on Silver Plate.”
 Dec. 1—Rev. H. D. RAWNSLEY.—“Some Royal Mummies.”
 Dec. 15—Rev. J. N. HOARE.—“Buddhism.”
 Dec. 29—Prof. H. A. NICHOLSON.—“A Piece of Limestone.”

1888.

- Jan. 12—Prof. H. G. SEELEY, F.R.S.—“The Race Characters of the English People.”
 Jan. 26—Miss NICHOLSON.—“Trolls and Fays.”
 Feb. 9—Mr. Chancellor FERGUSON.—“Clifton Moor in the '45.”
 Feb. 23—Rev. C. H. PAREZ.—“Eyes.”
 Mar. 8—Rev. H. J. BULKELEY.—“Eminent Persons who Died in 1887.”
 Mar. 22—Rev. J. J. STOCKLEY.—“Elizabeth Barrett Browning.”
 Apl. 5—Rev. Dr. HAYMAN.—“Something about Lord Nelson.”

WINDERMERE LITERARY AND SCIENTIFIC SOCIETY.

6TH SESSION, 1887-88.

President H. W. SCHNEIDER.

Vice-Presidents.

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

Secretaries.

W. C. MACDOUGALL. | FRANK BARTON.

Treasurer JOHN HOLLAND.

Delegates.

G. HEALEY.

J. HOLLAND.

Committee.

J. W. ATKINSON.
S. ATKINSON.
J. T. BOWNASS.
J. BELL.
F. BROWNSON.
W. E. BOND.
R. CLEGG.
F. CLOWES.
T. DOBSON.

G. HEALEY.
J. LONGTON.
F. MARR.
J. M. MOSS.
G. H. PATTINSON.
A. H. RAIKES.
A. RAWSON.
J. ROBINSON.
T. THOMPSON.

W. V. YATES.

The following MEETINGS were held during the Session:—

1887.

Oct. 20.—OPENING CONVERSAZIONE.

Oct. 31.—Rev. R. L. OWEN LEWIS.—“Plant Life.”

Nov. 14.—Mr. J. H. LEIGH.—Dramatic Recitals.

Dec. 5.—Mr. B. A. IRVING.—“Notes on Scandinavia.”

1888.

Jan. —Prof. FRANK CLOWES.

Jan. 9.—Prof. SEELEY, F.R.S., F.G.S.—“The Race Characters of the English People.”

Jan. 30.—Mr. B. A. IRVING and Rev. CANON STOCK.—Popular Lecture, with Lantern Views.

Feb. 13.—Mr. JOHN BUTTERWORTH, F.R.M.S.—“The Fishes of the Coal Period,” illustrated by the Oxyhydrogen Light.

Feb. 27.—Rev. J. M. MOSS.

Mar. 12.—Mr. FRANK BARTON, A.C.O.—“The History of the Pianoforte,” with Musical Examples.

Your Committee in presenting the Sixth Annual Report of the Society's work, have much pleasure in stating that the last year has been a highly successful one.

The number of subscribers has been nearly doubled, and whereas at the beginning of the session there was a serious deficit of £8 2s. 6d., the Society has now a credit balance of £5 18s. 7d.

The Session was opened with a *Conversazione*, which proved so enjoyable, that, acting on the suggestion of one of its members, the Committee decided to hold a Social Meeting later on; this was done on Dec. 19th, and was much appreciated by the large number

who attended it. The members of the Society were also invited by Col. MacDougall to an afternoon gathering and exhibition of pictures on March 23rd. The thanks of the Society are due to Col. MacDougall for his active efforts in its behalf.

During the winter there have been nine Public Lectures, and it is gratifying to be able to state that the attendances have been much larger than in any previous year. The amounts taken at the door have also been much greater than usual.

Free tickets to the number of 400 have again been distributed amongst the various schools in the district, and these have been eagerly sought after and made use of.

The best thanks of the Society are due to those who so kindly gave Lectures during the past Session; and also to the ladies and gentlemen who rendered help in the musical part of the *Conversazione* and Social Meeting.

The Society has sustained a heavy loss in the death of its President, the late Mr. H. W. Schneider, a gentleman who took a great interest in the work of the Society, and who gave it the most valuable assistance on several occasions.

The liberal assistance of Mr. Clowes deserves the especial thanks of the Society.

Report of Association Secretary.

THE Council has to report a satisfactory increase in the number of Members, and it has the almost certain promise of an addition to the number of Local Associations during the coming Session.

The following table shows the number of Members on whom the Capitation Grant was paid by the several Societies for 1887, and for the present year; together with the copies of the *Transactions* taken by them during the same years:—

	<i>Members.</i>		<i>Transactions.</i>	
	1887.	1888.	Part XI.	Part XII.
KESWICK	145	130	70	60
MARYPORT	90	100	60	62
LONGTOWN	46	32	12	12
CARLISLE	104	122	95	105
AMBLESIDE	93	90	20	10
SILLOTH	65	50	8	7
BRAMPTON	67	79	10	12
PENRITH	169	170	160	140
WINDERMERE	62	100	—	14
ASSOCIATION MEMBERS	23	37	23	37
	<hr/>	<hr/>	<hr/>	<hr/>
	864	910	458	459
	<hr/>	<hr/>	<hr/>	<hr/>

Some fifteen names have been added to the list of Association Members during the past year. This is satisfactory so far as it

goes ; but it will require very largely augmenting if the Society is to be placed on a firm basis. The Council would be glad of the co-operation of members generally towards the extension of this list.

LECTURERS.

Professor H. G. Seeley, F.R.S., was the Association Lecturer, and gave the greatest satisfaction to the members of those Societies before whom he lectured. Unfortunately it was impossible to arrange for his visiting each of the Societies ; but the Council trusts that it will now be able to make such arrangements as will enable the Association Lecturer to visit each Society during the coming Session.

A somewhat imperfect list of suggested Lecturers was issued to each of the Societies last Session. As such a list is likely to prove very useful in the compilation of the programme, the Council is very wishful to make it as perfect as possible. To this end it suggests that Local Secretaries should, if possible, get permission from gentlemen whom they think would consent to place their names on the list. If at the same time the subject of the lecture could be stated, this would be a very valuable addition to the list, and would save much labour. Of course it should be understood that "the fact of any gentleman allowing his name to appear on the list would only imply a general willingness to assist the Society, and not any obligation to accept any particular invitation to lecture." Any suggestions that will tend to increase the value of the list will be gladly received by the Council.

In another way the Council may be of use to the Local Associations. There are times when, through unforeseen circumstances,

a lecturer is unable to deliver the lecture he has prepared. As a break in the programme is not always desirable, it would be well if some arrangement could be made by which the engagement could be kept at short notice. The best thanks of the Council are due and tendered to Mr. R. J. Whitwell for his kindness in filling an unforeseen vacancy at Brampton on short notice. If other gentlemen would kindly place their services at the disposal of the Council on similar terms, it would tend greatly to the benefit of the Local Associations.

BOND OF UNION.

It has long been felt that a stronger bond of union is wanted, not only between the Local Associations themselves, but also between them and the Council—at least if the union is to be a reality. Were the finances of the Association in a more flourishing condition, much might be done to alter this state of things; at the same time, the alterations in the Rules, as suggested, will be a decided step in this direction, and the hearty co-operation of the members will prove of immense benefit. The Council having had the matter under its consideration, offers the following recommendations as of special importance:—

(1.) That the various Committees send up Resolutions to the Council bearing on any point likely to promote the welfare of the Association.

(2.) That, if possible, inter-Association Field-Days be arranged for—a Summer Session being thus made a part of the programme. If a *class* could be formed in connection with each Association, then Field-Days would come as a matter of course. The Council suggests a Natural History Class, though it sees no reason why

Science Classes should not be encouraged. The Syllabus recommended by the British Association (see Part VIII. *Transactions*) is wide enough for all purposes.

(3.) That each Society print the names of its members as part of its annual programme. This is done at Maryport with very good results.

(4.) That Hon. Secs. in making up their Annual Reports should briefly state how their work has been carried on, and the success that has been obtained.

(5.) That each Society endeavour to secure Lecturers for the other Societies, and especially for the smaller ones.

(6.) That Hon. Secs. send a copy of their Rules to the Hon. Association Secretary, so as to enable him to compile a code for suggested new Associations; also to send a copy of their Programmes to the other Associations in Union, together with, say a dozen, to the Hon. Association Secretary, for distribution amongst the Officers of the Association.

(7.) That members of any affiliated Association, and also the Association Members, be admitted to the Meetings of Local Societies other than their own, on the same terms as Local Members, on giving proof of membership; and that the Local Association Secretary be requested to write each member's name on the programme for the year—such programme to be used in support of membership when so required.

CIRCULATING LIBRARY.

With the same end in view, it is proposed to give effect to resolutions passed at almost every Annual Meeting held since 1883, with regard to a *Circulating Library*. A large number of

Transactions of various Societies has been received in exchange for our own Transactions. Seeing that so much valuable information is contained therein, and which, at present, is entirely lost to our members, it is proposed to appoint a *Librarian*, whose duty it shall be briefly to catalogue the chief contents of these Transactions, and then issue them to such Societies as may wish to read them. Such a Library would be of immense benefit to the projected Natural History Classes.

TRANSACTIONS.

The issue of the *Transactions* cannot be said to be at all satisfactory, and, sooner or later, some change will have to be made, unless indeed the issue becomes more general than at present. Many useful alterations are in contemplation, by which the *Transactions* will be greatly increased in value. Hence the Council trust they may count on the active support of each Local Association towards its distribution. Some of the Societies give it *free* to the members. If the other Societies would try the experiment of giving the next number, say, free, the Council would be in a very much better position to help the Local Societies.

There is, besides, a rapidly increasing stock of Back Numbers on hand—some 1700 or 1800 in number. The Council would earnestly ask members to supply themselves with copies. Such a course would materially help forward the work of the Association.

FORMATION OF CLASSES.

The Council would like to give full effect to Rule 9, especially with regard to University Extension Lectures, Natural History Classes, or Science Classes, in connection with the Local Associ-

ations. The advantages of such classes are too obvious to need mention ;—though the Council regrets its inability to render any pecuniary aid at present.

SUB-COMMITTEE.

It is suggested that a Sub-Committee be appointed to consider :—

- (1) Whether joint action can be taken in the matter of University Extension, and if so, how.
- (2) How best to encourage the “formation of classes.”
- (3) How to induce systematic work in connection with the syllabus of the British Association.
- (4) The further extension of the Association, and its more efficient working,
- (5) The conditions on which the Transactions received from other Societies are to be circulated.

HOW TO WORK A SOCIETY.

The Council has been asked to recommend a plan for the efficient working of a Local Society. In the absence of the Rules of the various Societies, they are unable to advise as to the merits or demerits of such rules ; but the following suggestions are offered as likely to be of use in attaining the desired end. Of course, in a Literary and Scientific Society, the main object is the furtherance of Literary and Scientific studies. Hence the Session may very properly be commenced, if not also be ended, by a *Conversazione*. The Council does not see any reason why other meetings of a Social character should not also form part of the programme. Then the programme ought to be of as varied a character as possible, at least one night being set apart for Read-

ings, Discussions, &c. It ought also to provide for continuity of operations during the Summer months, by the establishment of Field-Days, &c. But success depends not so much on the fact of having a programme—however good it may be—but on the way in which it is brought before the public, both members and non-members.

Where notices of every meeting have been regularly sent, not only to members, but also to non-members, it has been found that the Society has greatly benefited.

In those centres where there are Societies other than “Literary and Scientific,” arrangements might be made by which such Societies might be induced to attend at least the lecture given by the Association Lecturer; but this is a matter that more immediately concerns the Local Society.

There is still a small balance in hand, but much too small for effective working.

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

BALANCE SHEET FOR THE YEAR ENDING AUGUST 30, 1888.

RECEIPTS.	PAYMENTS.
Balance brought forward £5 2 10	Prof. Seeley, for 5 Lectures £26 5 0
Subscriptions towards Prof. Seeley's expenses ... 13 2 6	Towards buying Scarce Nos. 1 0 6
Capitation Grant on 873 Members ... 21 11 6	Late Hon. Secs. Postage A/c. 0 10 2
Subscriptions of 31 Association Members ... 7 12 6	Editor's " " 0 11 6
<i>Transactions</i> , Part XII.	Hon. Secs. " " 2 0 3½
Sold to Societies (360) ... 18 0 0	" Carriage, &c. ... 0 5 1½
" Assoc. Memb. (31) 1 11 0	Griffin's Year Book ... 0 6 0
Sold by Messrs. Coward 0 3 6	Messrs. Coward— Printing
Back Numbers sold ... 2 6 10	720 copies Part XII. ... 30 17 9
Authors' Copies ... 2 7 9	Do. for Doing-up 700 ... 3 13 6
Bank Interest ... 0 2 0	Do. for Printing, &c. Authors' Copies ... 2 18 8
£72 0 5	Do. for Stationery, &c. ... 2 13 4
	Cheque Book ... 0 2 0
	Balance in hand Aug. 23, 1888 0 16 7
	£72 0 5

Audited and found correct, October 3rd, 1888,

H. BUMBY,
R. H. HAMILTON, } *Auditors.*

ASSETS.	LIABILITIES.
Balance in hand ... £0 16 7	
Due for <i>Transactions</i> , Part XII.	
From Members ... 3 2 0	(Nil.)
From Association Members 0 5 0	
Subscriptions due from Association Members ... 1 5 0	
£5 8 7	

TRANSACTIONS, PART XII.

Sold to Societies	422
Sold to Association Members	37
Sold to Non-Members	2
Presented	61
On hand October 3rd, 1888	178
	700

THE "GIANT'S THUMB,"
PENRITH PARISH CHURCHYARD.

By GEO. WATSON.

(Read before the Penrith Society.)

THE mutilated cross in Penrith Churchyard, popularly known as the Giant's Thumb, is a relic of great antiquarian interest, and has lately been brought prominently before the public mind in consequence of its temporary removal, for the purpose of being more worthily placed upon a pedestal, and out of harm's way of the widened public footpath through the churchyard.

This old cross belongs to a class of early Christian monuments, whose age antiquarians are seldom able to agree upon more precisely than as being between the Sixth and the Twelfth centuries. They are variously spoken of as Anglo-Saxon, Celtic, and Runic crosses; the latter term, however, is loose and misleading—for in many instances crosses are so called when no Runic characters are to be found upon them.

It is scarcely possible to speak of the Giant's Thumb without referring also to the Giant's Grave, which is universally acknowledged to be one of the most interesting, as it is also one of the most inexplicable, monuments of antiquity to be met with in the country.

The earliest reference to Penrith church I have met with is in Camden's *Britannica*, written early in the 17th Century; he says, "Penrith, generally called Perith, is adorned with a pretty hand-

some church ;” but although Camden was the great antiquarian of his day, he makes no mention of either the Giant’s Grave or the Giant’s Thumb.

It must, however, be borne in mind that post-reformation antiquarians of Camden’s time, and indeed for three centuries or so after that, were so strongly influenced by the reaction from mediævalism, that their notions of antiquarian research were directed principally to Roman remains, to the neglect of, if not contempt for, all Christian monuments.

However, an edition of Camden’s work was published in 1695, with additions by the best local authorities in each county ; that for Cumberland was entrusted to the learned Dr. Hugh Todd, Prebendary of Carlisle Cathedral and afterwards Vicar of Penrith, who added to Camden’s meagre information a notice of the Giant’s Grave, recounting the tradition of the mighty hunter of Inglewood forest—mighty in stature as well as in hunting the boar—which has been repeated over and over again in all the local histories up to this day ; but he makes no mention whatever of the Giant’s Thumb.

One thing, however, the indefatigable doctor did, as Vicar of Penrith : he pulled down Camden’s “pretty and handsome” Gothic church, and built the Georgian edifice now standing.

The demolition of the old church, without as much as a line of description or drawing of its appearance, is matter for sincere regret ; but we must remember that at that time old Gothic churches were regarded as worthless rubbish, and no opportunity was lost for pulling them down and replacing them with bad copies of Wren’s classical churches, then in fashion.

If, then, the old church was so much despised, what wonder if the mean-looking old churchyard cross was not thought worthy of mention, and that, being in the way of the builders, the labourers were told to take it away and stick it in anywhere ?

The connection of the Giant’s Thumb with the Giant’s Grave is as mythical as the giant himself ; indeed it could not possibly be the same giant, for the monster who was laid at rest in the fifteen foot space assigned to him, huge though he was, must have been a

baby to the giant of the thumb. According to human proportions, while the giant of the grave stood with his head not halfway up the side of the church, he of the thumb must have stood twice the height of the steeple—certainly a giant of consequence.

Leaving the mythical aspect of the subject as being too vast for our limited imaginations, let us come to a more prosaic consideration of the subject.

First a few words about old crosses in general.

Notwithstanding the wanton and fanatical destruction of ancient crosses, there are still remaining scattered over Great Britain and Ireland numerous interesting examples of these Christian monuments.

They are classed principally as *Preaching*-, *Memorial*-, and *Market* crosses; and they stand all over the land as silent chapters in stone in the history of British Christianity.

The Giant's Thumb is undoubtedly one of the first class. They were erected in the earliest times of Anglo-Saxon Christianity, as missionary stations, before churches were built; where the grand old Saxon apostles—the saintly Cuthberts, Kentigerns, and Oswalds—met the people gathered from far and near to listen to their fervid eloquence. In this way the preaching crosses became centres of religious feeling, and sometimes fixed the name of the locality, as Crosthwaite, Crosby-Ravensworth, and many others.

The cross in Penrith churchyard, as we have been accustomed to see it, is by no means an imposing relic. It has been mutilated by knocking off the upper part of the cross. It has been broken off from its base stone or pedestal, and re-set in comparatively modern times by inserting it two feet and a half in the ground. Time and the weather have all but obliterated its sculptured ornamentation.

When it was ignobly placed in this position is not recorded; but from the fact now ascertained that it was set upon a portion of a 17th or early 18th Century headstone, and wedged up with blue slates. I should conjecture that it originally stood near the old church, the "pretty and handsome church" Camden tells us

about, and was removed to make room for Dr. Todd's great Georgian church in 1721 or 1722.

The original form of the cross has been a Greek cross and circle, i.e., the emblem of the Redemption surrounded by a nimbus or glory, familiarly styled a "four-holed cross." The holes, however, are too large and shapeless to come within any proper geometrical delineation, and, in my opinion, have been tampered with by widening out in an irregular manner.

I have heard a tradition that may possibly account for this. The late Mr. William Grisenthwaite, of this town, who had quite a store of local traditions, told me that the Giant's Thumb was at one time used as a pillory—the universal mediæval corrective of all social delinquencies;—and as if stamping the tradition as an historical fact, he said the last time it was so used, the unfortunate offender was a young woman, who died of a broken heart in consequence of her shameful exposure.

If this alleged tradition has a foundation in fact, it may account for the holes having been enlarged to accommodate the culprit's wrists.

The cross consists of one stone seven feet six inches long; the stem or shaft is twenty inches by nine inches at bottom, tapering upwards to the head.

The remains of sculptured ornament to be seen upon the shaft of the cross indicates that a running scroll or spiral pattern has been used; it occurs frequently on Anglo-Saxon crosses, and may be seen on the famous Bewcastle cross, and more plainly still on the Irton cross.

Mr. Owen Jones, in his *Grammar of Ornament*, gives examples of this class of ornament; under the head of Celtic Ornament he refers to some forms of the scroll in the Manx and Cumberland crosses of that period, and suggests that they were copied from the tessellated pavements left by the Romans in Britain; and he also further shows that the Romans in their turn had adopted them from ancient Greek art.

The running scroll form of decoration, which has secured admiration from the earliest times to the present, has been adopted

in the borders of the marble mosaic floors lately laid in the chancel of our parish church, illustrating forcibly the oft-quoted sentiment, that, "a thing of beauty is a joy for ever."

It is intended to re-erect* the old cross upon a suitable pedestal near the place where people have been accustomed to see it; and from its improved appearance, when so elevated, it will probably become better known as the Old Churchyard Cross than as the Giant's Thumb.

* Since this paper was read the old cross has been re-erected on a pedestal bearing the inscription: "Re-erected on new base. Carved designs reproduced from the cross. 1887." The carved designs are the running scroll and the interlaced ring and band pattern. These patterns, all but obliterated by the hand of time, and requiring the eye of faith to see them in the old cross, have been curiously indirectly confirmed by excavations just made at the sides of the famous hog-backed stones of the Giant's Grave, by which these very patterns have been brought to light in a most perfect state of preservation.



WAS ST. PATRICK A CUMBRIAN?

BY REV. JOHN I. CUMMINS, O.S.B.

(Read before the Maryport Society.)

THE question as to the birthplace of the Apostle of Ireland has long been a matter of controversy. Almost as many places claim the honour as of old claimed that of being Homer's birthplace. Nor is it likely, in the absence of fresh and convincing evidence, that the question will ever be satisfactorily settled. It may seem therefore a waste of time to discuss the matter further, more particularly when we propose to advance an entirely novel theory, and to defend the claims of yet another country to the honour of having given birth to the Apostle of the Irish. Yet the very fact that learned men have so long disagreed shows that there is still room for other claims; and the very novelty of an opinion may lend interest, if nothing else, to its discussion.

The old national rhyme asserted that "St. Patrick was a gentleman, and came of decent people;" but so vague a description of his family and connections was not likely to satisfy either the devotion of his admirers or the curiosity of archæologists. Nor were materials for further conjecture altogether wanting. In the authentic writings of the Saint himself, in the early lives written by his immediate disciples, as well as in the ancient traditions of his people, there were to be found allusions and names which have proved a fertile source of conjecture as to the nation and locality from which he sprang. The main facts are admitted; it is in the interpretation of them that authorities differ. Many have claimed

the Saint for Kilpatrick near Dumbarton on the Clyde ; some for the S.W. parts of Wales, about St. David's ; some for Brittany and the north of Gaul. I am not aware that anyone has, until very lately, claimed St. Patrick as a Cumbrian. Yet this is what I am prepared to do. The probabilities of the evidence seem to me to point to some part of the British coast south of the Great Wall of Hadrian, i.e., to some part of the modern county of Cumberland, as the true locality of St. Patrick's birth.*

May I express the hope that the subject under discussion will not be found too dry for a popular lecture? There are surely elements of general interest even about an archæological question like this. It will be something if we can add St. Patrick to the not very long list of worthies whom Cumberland has so far produced. And even if we fail in this effort, we may still find incidental points of interest to compensate us for our trouble. To a cultivated mind there is always a pleasure in realizing in imagination the conditions and appearance, ages ago, of the countryside with which we are now familiar. It has been well said that "whatever helps men to realize the past, the distant, or the eternal over the temporary and the present, advances them in the dignity of thinking beings." And if get nothing more from our inquiry than a clearer picture of what West Cumberland, with its towns and people, was like fifteen hundred years ago, we shall not have had our labour in vain.

A word or two must be premised as to the authorities for the facts of St. Patrick's history. There are several very early lives of the Saint. But more important are two documents which profess to be his own genuine writings. One of these is an Epistle to Coroticus, a British prince of some part of South Wales. The other is called the "Confession of St. Patrick," and is a kind of autobiography, something in the style of the more famous Con-

* This suggestion has been already made by Sir W. Butler in the first number of "Merry England," May 1882. From the obvious similarity between Banaven and Whitehaven, Col. Butler ascribes the honour to this latter town. Whilst agreeing cordially with his main conclusion, I believe that a closer acquaintance with the archæology of the locality shows the improbability of Whitehaven being the Banaven of St. Patrick's Confession.

fessions of his great contemporary, St. Augustine of Hippo. In these two writings occur the allusions which are the only certain ground that we have to rely upon. It would take us too long to enter into the question of their authenticity. It must suffice to say that they are generally accepted as the genuine writings of the Saint. The Bollandist, for instance, whose name is synonymous for accurate and extensive scholarship, acknowledge their authenticity; so does Archbishop Ussher. Dr. Todd, a recent Protestant historian, quotes in their favour Spelman, Ducange, Mabillon and others. In one word, they are quoted on all hands as our only and sufficient evidence for what we know of the Saint's life. We shall rely for our materials, then, upon these two writings alone, leaving aside altogether the fuller, but much less authentic, details of the later lives. The later these are in date, and the further removed from original sources, the more detailed and dogmatic do they become. The most recent ones are quite confident in their identification of localities which are barely referred to in the older documents. These Lives are the original sources of many of the traditions about the Saint, but as authorities on archæology are of the very slightest value. The one or two simple statements which the Saint makes about himself are worth more than all the guesses of later writers put together.

This then is how the Saint speaks of himself:—"According to the flesh I am of noble birth, my father being a decurion; but I have bartered my nobility for the good of others. . . I, Patrick, had for father Calphurnius, who was of the town *Banaven Taberniæ*. He had a farm close by where I was made captive. . . I was carried captive into Ireland with *many thousands of men*,—as we indeed deserved, for we had not kept the commandments nor obeyed our priests who taught us the way of salvation."

From these passages, and from others too long to quote, we learn the following facts. Saint Patrick was born at a place in Britain called "Banaven Taberniæ" (Banavie of the Tents or Camps.) His father seems to have been an officer in a Roman legion stationed at that place, and to have been of Gaulish, or perhaps Frankish, nationality. His mother (Conchessa) was most

likely of Gaulish extraction; and is said to have been a niece of St. Martin of Tours. During his boyhood a descent was made upon the coast where he lived by pagan pirates from Ireland, by whom his parents were slain, and he himself was carried away captive. The date of his birth must be about A.D. 387; that of his captivity, about 400. It is particularly to be noticed that he had been living at this time in the *midst of a large Christian population*. From his native country he was carried to some part of the north-east of Ireland. Trustworthy tradition points to the mountain slopes of Antrim as the spot where the future apostle fed the flocks of his pagan master. Escaping from captivity after some years, he describes himself as "journeying" southwards for many days, then crossing the sea until he came to what he calls his "fatherland" (*patria*); and this seems from subsequent passages to have been Gaul.

The problem before us is to identify this "Banaven Taberniæ," and to explain the various allusions made by the Saint. At the outset we are met by two rival theories supporting respectively the claims of Gaul and of North Britain to be the birthplace of the Saint. I think it can be shown that both these claims rest upon mistaken interpretations of the passages in question; and that without denying the facts upon which they rely, we can more justly fit them in with quite a different opinion.

1. The principal grounds for the first theory that St. Patrick was born in Gaul—somesay near Boulogne, somesay near Tours—are the tradition of his relationship with St. Martin, alluded to in the later lives, and the fact that he seems to speak of Gaul as his fatherland. But there is no necessary inference from these statements that he was himself born in Gaul. It is a matter of history that legions which had long been stationed and recruited in Gaul were, about this very time, sent to Britain under Theodosius to defend the northern frontier against the Picts. Calphurnius, St. Patrick's father, may well have been a Gaul, or perhaps a Frank, who had enlisted in one of the legions, and married St. Martin's niece whilst still in Gaul; but whose child had been born during his parents' residence in Britain. Under such circumstances the boy would naturally

speaking of Gaul as his "fatherland," would have all his relatives there, and would go there on his escape from captivity. In precisely the same way, the child of an English officer born whilst his father was stationed with his regiment in India would still call England, not India, his fatherland, where his relatives would be found, and whither he might go as to his own country. All the evidence for St. Patrick's connection with Gaul, *through his family*, we can readily accept; but this does not prove that Gaul was actually his birthplace. And we cannot evade the evidence of other most clear facts, which point to a connection of another kind with some part of Great Britain.

But what part of Britain was it? His father would appear to have been engaged in the defence of some military station against the Picts, who towards the close of the Fourth century were constantly invading the northern provinces. It would be during a successful attack of this kind that the parents of the child were slain, and that he himself, with many thousands of others, was made captive. Where was this station? All the probabilities of the case—all the historical evidence from other sources, point to some part of the northern and western frontiers of Britain as the scene of the invasion. But was it somewhere on the Clyde, by one of the fortresses of the frontier of Antonine? or was it not rather in some part of modern Cumberland, at some station near the great Wall of Hadrian?

2. I must at once admit that the more common opinion has hitherto been that it was in Clydesdale, probably near Dumbarton, that Calphurnius was stationed, and that his son was made captive. The little village of Old Kilpatrick is further indicated as being the exact spot. The name indeed would imply nothing more than that in ancient times a cell or church had existed there dedicated to the Saint. On this ground we might almost as well advance claims for Patterdale, or even Aspatria. There is no record of even a chapel at Kilpatrick before the Twelfth century. But the chief objection to this theory is that it does not square with a most important detail, and fails to take account of the following weighty fact.

In his "Confession," the Saint distinctly implies that, before being made captive, he was dwelling amongst a *large and settled Christian population*. He alludes to congregations of Christians enjoying the full exercise of their religion, with priests, churches, etc.;—and apparently by no means in the first fervour of conversion. He blames them for having fallen off in their piety; expressing his conviction that it was because of their sins that God had permitted them to become a prey to their enemies. These are his words:—"I was carried captive into Ireland with *many thousands of men*—as indeed we deserved, because we had not kept the commandments, nor obeyed our priests who taught us the way of salvation."

Now if we are to verify these plain words, we shall have to localize St. Patrick's birth in some part of Britain,—it must be on the sea, and near some exposed frontier,—where there could be at the time a numerous population of Christians. He speaks of "*many thousands of men who were not obeying their priests,*" etc. But to account for such a Christian population in Britain, before the close of the 4th century, we must suppose a comparatively settled colony. There were no Christians in those days beyond the frontiers of the Roman world; and I can find no reason for believing that such a population as St. Patrick speaks of was to be found at this time along the wall of Antonine, or indeed anywhere in the province of Valentia. There are of course extensive Roman remains in that region. It had been the battlefield of Britain for three hundred years. Dumbarton itself was a strong Roman fortress, and the termination of the rampart of Antonine. But all the known circumstances of the district tell against the likelihood of its having any large Christian population, or indeed of its being well populated at all. The country between the two Walls,—what we may roughly indicate as the modern Lowlands,—was the latest of Roman conquests in the Island, and the least settled. Its very name—Valentia—was only derived from the Emperor who died in 367, just a few years before St. Patrick was born. It was little more than an outpost of Roman Britain, which really ended at the Wall of Hadrian; and it remained to the end a province only held by military force and especially exposed to barbarian inroads. It had

not been colonized long enough to allow the growth of settlements with a civil population dwelling peacefully under the shelter of the Roman garrisons. It was a country therefore where we should be least likely to find a numerous Christian population such as that of which St. Patrick speaks. The district might fit in fairly well with the other incidents of the story, but the impossibility of reconciling its circumstances with this main fact is, to my mind, fatal to its claims to be considered the birthplace of our Saint.

Very different was the condition of the country which lay to the south of Hadrian's Wall,—that is, of the district now known as Cumberland. There everything points to the presence of a large population, which there is nothing inconsistent in supposing was by this time largely impregnated with Christianity. But in order to realize fully the force of this part of my argument, it will be well to try to form some idea of what Cumberland was like during the period of the Roman occupation.

Much has been changed in the aspect of the country during the course of so many ages, but much remains unchanged. The great physical features are of course unaltered. Skiddaw and the high mountain ranges filled then as now the horizon to the east. Criffel and its neighbours overhung the Solway from the opposite coast. The same rivers rolled along the same beds, perhaps somewhat deeper and fuller than now. The coast line, too, would be much the same, except that the tide may have insulated such promontories as those at Maryport and St. Bees. But we must dismiss altogether from our minds the notion that Cumberland was then the uninhabited, unimportant, desolate region which it did afterwards become. It was not, of course, cultivated and peopled as it is now; but it was very much more populous than it became during the wild times that followed the withdrawal of the Roman arms. Much of the land was morass, or dense forest, or barren moor; still it was traversed by many lines of broad highways maintained in constant use and good repair; and it contained Roman stations both numerous and important, the presence of which argues settlements of considerable size. The great Wall of Hadrian ran through the district from Bowness on

the Solway, through Carlisle, along a tributary valley of the Eden into that of the Tyne, and so on to Wallsend on the eastern coast. This Roman Wall was one long series of castles and stations, many of which grew to be important colonies and fortified towns. Besides these stations, another series of fortifications carried along the sea-coast to the west the same defence against the Scots which the Wall provided on the north ; whilst again another batch protected the network of military roads which converged from all parts upon Carlisle.

There was a very obvious necessity for the great number of fortified places in this locality. Cumberland has always been a Border county, exposed to raids from external enemies, and needing constant protection. In this respect its condition was very different from that of the rest of Britain. When the Roman conquest had been completed and the early risings finally quelled, the provincials of Britain settled down into quiet contentment under the peaceful rule of their conquerors. Subdued but not enslaved, and accepting gladly the laws and manners of their rulers, they were soon admitted to the full rights of Roman citizenship. In course of time the need for garrisons and walled cities amongst them entirely passed away. A revolt against the rule of Rome was out of the question. There might be risings in favour of rival candidates for the imperial crown in which the provincials as well as the legions took part, but after the First century we find no organized attempt to shake off the civilizing yoke of the empire. Now this peaceful state of affairs never came about on the Border, by the line of the great Wall. Here there was always need of powerful garrisons to protect the province from the inroads of a restless foe. The Cumbrian fortresses were consequently not like those of which we see remains in the south of Britain or along the Welsh frontier, or even like those to be found in North Britain. They were not manned only for a short while, in one or two campaigns, until the subjugation of the natives had been accomplished ; they were the permanent defences of the country against an ever-present foreign enemy. True, an entire province had been subdued to the north of Hadrian's Wall, and a further line of defence erected

in the rampart which ran between the Clyde and the Forth. But nothing can be more certain than that,—whatever may have been the numbers and strength of the Roman fortresses in the Lowlands,—this province never experienced the same lasting peace which its more southern neighbours enjoyed. It was always an outpost, exposed to the first attack, and frequently ravaged by foes who yet did not dare to pass the second line of defence. The conquest of Britain by the Romans may be illustrated by comparing it with the British conquest of India. Now that India has peacefully accepted our rule, there is not the same occasion as there used to be to mass large bodies of troops throughout the country. On the north-west frontier, however, strong and frequent garrisons must still be kept, to hold in check the restless tribes beyond the border, much as in old times Cumberland bristled with Roman camps. The parallel might be pushed still further if we imagine Afghanistan to be held—as some think it should be—by British troops as a remote defence against Russian invasion. The further province would be an outpost to British India, much as Valentia was to Roman Britain. It would still be liable to be overrun by waves of warfare ; but though they might break through the first barrier, they would be spent before they beat upon the real frontier of the empire.

As a fact we know that this outlying province was being continually invaded, notwithstanding the defence afforded by the more northern Wall. After the peaceful reigns of the Antonines it was so constantly attacked that in A.D. 208 the Emperor Severus had to undertake its reconquest, and even his famous expedition was not entirely successful. In the middle of the 4th century it was again entirely lost to the Roman power ; so much so, that when it was reconquered by Theodosius in 367 it was treated as though it were *a new province*, and the new name of Valentia was bestowed upon it in honour of the reigning Emperor Valens. Fifteen years afterward, in 383, the British Emperor Maximus had again to repress the incursions of the Picts and Scots who had ravaged the new province ; and before the end of the century, “Stilicho once more drove back the invading tribes and recovered the territory

as far as the Northern Wall." All this was going on during the years of St. Patrick's childhood, at the very time when the advocates of the Kilpatrick theory would have us believe that in this sadly harassed province—a very outpost of civilization—there existed a numerous and a Christian population.

We begin to understand now the position which Cumberland held in the defence of Britain, and the reason for the number and importance of its stations. It was the true border of Roman Britain. The Wall of Hadrian was the real line of defence which had to be protected efficiently notwithstanding the existence of the outlying province of Valentia. There was moreover the long coast line exposed to a danger from which even the conquest of Valentia afforded little protection, viz., the incursions of pirates from Ireland. Hence the chain of forts, some ten or twelve in number and connected by a military road, which we find extending from Bowness along the brink of the Solway, as far as Moresby and Egremont.

Such being the military situation and needs of our county in Roman times, it remains to examine what would be the domestic and social consequences of the continued presence of these large garrisons. In the first place, it is just the neighbourhood where—apart from the proof afforded by actual remains—we should naturally expect to find a large population. I suppose in a camp like our own, for instance, there would generally be stationed about 1000 soldiers alone, not counting camp-followers and civilians. Then consider the necessity of provisioning the garrisons, and all that this work would entail. Whether the supplies were brought by sea in fleets, or in convoys along the great roads, or were partially obtained from agriculture in the neighbourhood,—they would necessitate the employment of many besides the soldiers themselves. Lastly, we must not overlook the system of military service established under the Romans at this period. They had the custom of giving lands to their veterans as a reward for their service and valour, and of requiring them to settle on these lands and colonize them. The legionaries were stationed in the same camp for such a length of time together, that they might well look

upon it as a home. Many would intermarry with the people of the county ; the wives and families of others would be brought with them ; and thus, in course of time, from one cause and another, there would grow up around each great station a large, permanent population, dependent upon, and closely connected with, the Roman garrison, sharing its fortunes, and suffering its fate.

In his "Origins of English History," Elton has thus described the process we are considering :—

"The soldiers were pioneers and colonists. A Roman camp was a city in arms ; and most of the British towns grew out of the stationary quarters of the soldiery. The ramparts and pathways developed into walls and streets ; the square of the tribunal into the market-place ; and every gateway was the beginning of a suburb where straggling rows of shops, temples, gardens, and cemeteries were sheltered from all danger by the presence of a permanent garrison. In course of time the important positions were surrounded with lofty walls protected by turrets set apart at the distance of a bowshot, and built of such solid strength as to resist the shock of a battering ram. In the centre of the town stood a group of public buildings, containing the court-house, baths, and barracks ; and it seems very likely that every important place had a theatre or a circus for races and shows." (p. 32.)

Here is another account, written in the 12th century, describing what remained of one of those cities at that time :—

"Caerleon," writes Giraldus Cambrenses, "was excellently built by the Romans with walls of brick ; and there are still to be seen many traces of its former greatness ; huge palaces aping the Roman majesty with their roofs of antique gold ; a giant tower and noble baths, ruined temples, and theatres of which the well-built walls are standing to this day. Within and outside the city the traveller finds underground works, canals and winding passages, and hypocausts contrived with wonderful skill to throw the heat from little hidden flues within the walls."

But we have not to go so far as South Wales for an illustration of the process by which a military station grew gradually into an important town. We have an example of it under our own eyes. Indeed the first description we gave might have been taken literally from the camp with which we in Maryport are most familiar. Try to call up in imagination the picture which our own hilltop would present in the middle of the 4th century. Standing four-square, and crowning the summit of a high insulated hill some one hundred and eighty feet above the sea, was the camp itself, guarded by

fosse and mound, and probably by a brick wall as well arched over the four gates, and with roads leading from the gates to north-east and south. Many of the principal buildings, with the greater part of the town, would be outside the camp itself, extending, though not in close order, all over the top of the hill on which the modern town is built, and to the north-east over the fields at the end of Camp Road.

The well in the centre of the camp is still visible, other remains have been unearthed of various buildings which may have been a temple, and a basilica, i.e. a hall of justice, or a bath (and of course you are aware that there is no other spot of Britain where so large a number of altars has been discovered). Besides the great camp, another "castellum" crowned the little hill which guards the entrance to the river, now known as Castle Hill, or Motehill; whilst another protected the ford which crossed the Ellen at Netherhall. The station is supposed to have been founded by Agricola about A.D. 80; and there are reasons for believing it to have been for some time at least the head quarters of the admiral in command of the Roman fleet.* Probably many of the officers of the fleet and of the legions would have their families living in stately villas overlooking the magnificent estuary. The station must have been the chief post of defence on the coast; and no one who has stood on Camp Hill and surveyed from it the broad reaches of the Solway and the long stretch of Scotch coast from Annan to Burrow Head, can doubt the purpose or the importance of the site.

Such a description of our town in the fourth century may seem

* Mr. J. B. Bailey, of Maryport, has shown that there are strong reasons to believe that the station at Maryport was founded by Agricola himself in one of the campaigns described by Tacitus. The historian says, "loca castris ipse capere, æstuaria ac silvas ipse prætentare" (Agricola xx.); and again:—"Annotabant periti non alium ducem opportunitates locorum sapientius legisse. Nullum ab Agricola positum castellum aut vi hostium expugnatum aut pactione ac fuga desertum" (xxi.) Four altars have been found at Maryport dedicated by M. Moenius Agrippa, who is known to have been commander of the Roman fleet in British waters during the time of Hadrian. The name of the camp is still doubtful, but Mr. Bailey has advanced good reasons for supposing it to have been the Glanoventa of the Itinerary of Antonine.

to some fanciful or exaggerated. But we must remember that at the time of which we are speaking, Glanoventa, or Axelodunum, or whatever name it may have borne, was no new colony. The Roman occupation of Britain had continued for nigh four hundred years. During that long period stations and towns had time enough to grow into large cities, and to recover from the effects of many invasions and destructions. That our own camp had been occupied almost without a break during the whole of those three centuries, we have convincing evidence both from coins and inscriptions. During that long period a numerous population both of colonists and natives must have grown up, dwelling along the military roads, and at the neighbouring outposts, safe under the protection of the impregnable camp. We may therefore fairly apply to our own locality what archæologists tell of the size and magnificence of some of the Roman cities in Cumberland. "These stations were crowded with streets and buildings, and adorned with baths and temples." "It is hardly credible what a number of august remains of Roman grandeur is to be seen here to this day. In every place where one casts his eyes there is some curious antiquity; either the marks of streets and temples in ruins, or inscriptions, broken pillars, statues, and other pieces of sculpture all scattered on the ground" (Gordon, *Iter Sept.*) "There are ruins so vast and complete still scattered over these desolate hills, that they have been styled, without much exaggeration, the Tadmor and Pompeii of Britain" (Elton, 328).

Now in a district such as Cumberland was in the closing years of the fourth century, with its large population and continual intercourse with the rest of the Roman world, I find no difficulty in believing that there might exist Christian congregations on such a scale as to verify the allusions in St. Patrick's Life. The question as to the first introduction of Christianity into these parts is a most interesting one; unfortunately it is one for the solution of which few materials are at hand. It has been remarked that there are few, if any, traces of the Christian religion to be found in the Roman remains that still exist in Cumberland. All the inscriptions and all the monuments are of pagan origin. Yet it can

hardly be doubted that the Christian faith must have been brought into these parts long before the time of St. Patrick, i.e. before A.D. 400, through the legionaries recruited in all parts of the world. There was a flourishing Christian church in Britain before the year 300; there are authentic records of martyrs for the faith under the Emperor Diocletian; and after that time the conversion of Constantine and the official recognition of Christianity must have given splendid opportunities for the spread of the faith. St. Patrick was born about A.D. 387. Fifty years before his birth, three British bishops had sat in the great Council of Arles (328). Fifty years after his birth, the Britons were reckoned to be Christians, just as much as the natives of Gaul or Spain. We can well believe therefore that by the last quarter of the fourth century many both of the legionaries and the provincials had, even in the north, embraced the Christian faith, and that here, as elsewhere, Christianity was the recognized religion of the state.

In some such district then as this, where Roman magistrates still held sway, and where Christian influences had made much progress, St. Patrick's father was dwelling towards the close of the fourth century, exercising there the honourable office of a decurion, whether civil or military. He would be a man of substance and consideration, living in some state, cultivating a farm near his station, and attended by numerous domestics. Then comes the sudden descent upon the coast of the Pictish pirates. Too probably the garrison had been already weakened by the withdrawal of many of the soldiers. It was now completely defeated. Calphurnius and his wife were slain; his children, with numbers of others, were carried off into slavery, and the once flourishing colony was laid waste. What a vivid picture the story gives us of the last troubled days of the Roman occupation of Britain; how hard to realize that the peaceful street-covered slopes of our familiar hills were once the scenes of such slaughter! Yet we know that such must have been the case. The traces of burnt houses and broken altars, if not the careful concealment of other altar-stones, suggest the final fate of the settlement. It is historically certain that about the very time when St. Patrick was made captive, the

station at Maryport suffered the same disaster as is described in his life:—a weakened garrison, a successful onslaught of the Picts, the camp seized, the town burnt, the people slain or carried into slavery. All along the wide frontiers of the falling empire scenes like these were being enacted. The legions had been withdrawn to defend more important districts, and the borders were left exposed. Here in Britain, the provincials, freed from allegiance to their imperial master, were expressly bidden to see to their own defence. Unused to warfare, and enervated by a long continued peace, the hapless citizens proved unequal to the task. The barbarians, revelling in the novel luxury of victory, swarmed over the Walls, seized the stations, and sacked the wealthy cities of the province. In a few years the entire Roman polity in Britain was overwhelmed; and nothing remained to mark the long dominion of the imperial race save the slabs and altars and coins that fill our museums, the long straight lines of highways stretching over the country, and the skeletons of camps and cities still strewn throughout the land.

But we must return to our immediate subject, and we are now in a better position to gather up the threads of our argument. Two points then emerge with some clearness from the records of the fourth century which we have been considering. (1) That St. Patrick was born in some place in which there lived a fairly large Christian population. (2) That the place was known as Banaven of the camps. Now the first fact cannot be verified of the neighbourhood of the Wall of Antonine, or indeed of any part of Valentia, a province continually devastated by the barbarians and at the date of his birth only recently re-acquired to the empire. But it fits in exactly with what we know of the vicinity of the Wall of Hadrian, with its numerous well fortified camps, and its colonies that had existed for three hundred years. I believe that the mistake has arisen from the common error of not distinguishing between the two great Roman Walls. The northern Wall of Antonine has been confounded in this, as in other matters, with the more important Wall to the south which bears the name of Hadrian. Later writers, living at a distance, and forgetting the

distinction, have attributed to Clydesdale what should really be said of Cumberland, and have thus given rise to the traditions on the strength of which Kilpatrick claims to be the birthplace of our saint.

Now as to the second point; it is more difficult but less important to localise the name—"Banaven of the camps." The epithet "of the camps" surely applies better to Cumberland, bristling as it did with Roman stations, than to any other locality in Britain. No other part of the island is so thickly dotted with camps as this; no other part of the island was the scene of such prolonged warfare; no other part of the island therefore would better deserve the designation. The inference remains that St. Patrick's birthplace would be somewhere in the vicinity of Hadrian's Wall; and as it was on a coast exposed to the attacks of Irish pirates it would be, not on the east side by the Tyne, but on the west, that is in Cumberland. May we go a step further, and try what particular part of Cumberland best fits in with our story? Here we shall have to rely upon any evidence we can get out of the proper names. What then is the meaning of Banaven? I suppose it signifies the mouth of a river—the opening of some water. Avon or Afon is one of the commonest Keltic names for water. It is found in names of rivers all over our island, and is parallel with Axe, Exe, or Oich, or with the Aln, Allen, or Ellen with which we are more familiar. The prefix Bun or Ban is also not an uncommon one, being synonymous with Inver and Aber, as in Inverness or Aberdeen, and meaning the mouth or opening of a river, the junction of one stream with another. Thus for example: There is a Bunoich at Fort Augustus, a Bunawe on Loch Etive, and a Banavie by Fort William—all meaning precisely the same thing, and the latter being almost the same form as we find in St. Patrick's story. In this connection the name helps to particularise the locality we are seeking by requiring the presence of some stream, and its confluence with another or with the sea; and so would exclude such inland camps as those at Old Carlisle and Papcastle, or the stations actually on the Wall. The prefix Ban might indeed be translated White, as we find it in the

word Banshee, "the White Woman." We should then have Banaven meaning the White Water, or Haven. In this case it would serve as the literal translation of the name of a neighbouring Cumbrian town; but besides the fact that the name of Whitehaven is most probably of English, not of Keltic derivation, and has an altogether different meaning, its claims to be considered St. Patrick's birthplace are further barred by there being no river there, by there being no natural feature which would deserve to be called White, and what is more important, by there being no ancient fortification or settlement nearer than Moresby or Egremont. Under its former and more probable meaning then, as the mouth of a river, the name Banaven would apply equally well to the Derwent at Workington, or to the Ellen at Maryport. The latter has undoubtedly been an ancient haven or harbour. It would be quite deep enough for the light galleys of the period, and would be well protected both by its natural configuration and by the fortifications of Mote Hill and the Camp. We might notice too that Ellen and Aven both mean precisely the same thing; they are two of the commonest Keltic names for a river. The old name Ellenfoot and Banaven are thus identical in meaning; though I should not like to assert that they are on that account interchangeable.

A local antiquarian of considerable repute has advanced good reasons for believing that the original name of our camp was the "Glanoventa" of the Itinerary of Antonine. Now it is well known that Keltic derivations are a great snare,—veritable pitfalls to the unwary explorer of ancient records. The cynical have even been known to hint that a Keltic name may be twisted into almost any meaning. I dare not enter on such debateable ground. But I would just suggest whether it might not be possible—with liberal help, of course, from Grimm's laws and the other resources of perplexed etymologists—to identify the "Banaven" of St. Patrick's story with the "Glanoventa" of the Itinerary. If it could be done it would throw light upon two most interesting problems—the name of our ancient Camp, and the birthplace of St. Patrick. I do not venture to be dogmatic on such a point, but merely throw it

out as a suggestion. But whatever may be its worth, and quite apart from this last suggestion, I would conclude from the previous argument that there are some good grounds for believing St. Patrick to have been a Cumbrian. And if we are to look for his birth-place in Cumberland, it must be at some station on the Solway; and if at any Roman Station on the Solway, you at least will agree with me that the balance of probability lies in favour of the place with which we are connected; a town which can boast of a very venerable antiquity as well as of its splendid future; a town which will never be destitute of historic importance and archæological interest if it can lay claim to Agricola as its founder and to St. Patrick as one of its citizens!

ORNITHOLOGICAL RECORD FOR CUMBERLAND,
 JANUARY, 1887—JUNE, 1888.

BY H. A. MACPHERSON, M.A.; M.B.O.U., CARLISLE,
 AND W. DUCKWORTH, ULVERSTON.

ONE of the chief charms of Zoology lies in the abundance of fresh facts that from time to time reward the zealous student ;—and we are glad to say that the facts which will be noticed in the present report, represent a small portion only of the incidents detailed in our notebooks and ledgers.

At the outset, we feel it right to call attention to the insufficiency of the protection at present vouchsafed to our nesting birds.

Of our really local birds, the Pied Flycatcher is a prime favourite. For the last ninety years at least, very large numbers have been accustomed to repair to the fine hanging timber which clothes the banks of the river Eamont at Lowther. But when the birds arrived in their old haunts on April 25th, 1888, they found that most of the old trees in which they and their forefathers had nested, had been cut down during the winter. The birds were obliged to scatter in search of fresh quarters, and an historic breeding colony has thus been reduced for the present year, at any rate, to a miserable representation of two or three pairs.

It is consoling to know that these evicted tenants of Lord Lonsdale have not journeyed to the Arctic Circle after his lordship, but settled down at no great distance from the now-desolate Lowther.

Whilst studying their habits in June, 1888, with our friend Mr. Edward Tandy, we were rejoiced by the discovery of a charming little nestling Redstart (*Ruticilla phoenicurus*), snugly esconced in the nesting hole of a pair of Pied Flycatchers, which had evidently hatched the stranger among their own pretty, spotted brood of five. The nesting hole, originally owned by a pair of Jackdaws (*Corvus monedula*), must have been selected for nidificatory purposes by a female Redstart, which again was ousted by the Flycatchers after she had laid a single egg. The next pair of Pied Flycatchers located on the same ground were nesting in the dead limb of a tall Scotch fir; on the other side, a third pair reared their young in the base of an old oak; a fourth had chosen a recess in an ash; a fifth nested in the very heart of an old elm, entering by a narrow fissure from above; a sixth couple preferred masonry, and their nest was stowed away in the centre of a low stone wall. Too much protection cannot be afforded to this melodious Flycatcher, and its sweet song deserves to be better known.

In a great wood, not far from the above-mentioned colony of Pied Flycatchers, many of the trees are riddled by the tunnels of boring caterpillars, and here the Greater Spotted Woodpecker (*Dendrocopus major*) rears its young. The stations of this species in Cumberland are however so few that they can be counted on the fingers of one hand. Gamekeepers should be subsidised to protect these useful and persecuted birds. Tidings reached us of at least one pair of breeding birds shot on the Scottish border during the present year; a short-sighted proceeding which it would be difficult to excuse.

The Lesser Spotted Woodpecker (*Dendrocopus minor*) has reappeared in our midst, and last year (1887) a pair of Green Woodpeckers (*Gecinus viridis*) reared their brood in safety upon the northern limit of their breeding range in Great Britain.

We regret to say that the senseless war waged against the Buzzard (*Buteo vulgaris*) has in no wise abated. Considering that this fine hawk subsists largely on carrion, the injury to property which results from its presence among our lake mountains must be granted to be small.

The dashing little Merlin (*Falco æsalon*) is becoming more scarce every year, because old birds and young are all trapped at the nest. Yet we have never conversed with a keeper who condemned the Merlin; and our own observations proved, years ago, that its prey includes little else than small field birds.

Pole traps continue to wreak havoc among our Owls, and should be dispensed with, whenever possible.

We do not propose to speak at length of the Dotterel (*Charadrius morinellus*), but candour compels us to state the fact that such few trips as still visit us are decimated for the sake of fly feathers. It is high time that anglers should discountenance the vandalism of their agents.

Directing our thoughts to the North of Cumberland, we are reminded that the Shoveller (*Spatula clypeata*) continues to breed sparingly. A rumour reached us lately that two working-men in Carlisle tried to kill a pair of Shovellers at their nest. We trust that the report was unfounded. Residents in the neighbourhood of Sandsfield and Rockliffe are cautioned against capturing Shel-drakes at their nests, and lifting whole clutches. We have our eye upon the offenders, and advise them to leave the birds in peace.

The Gulleries, Heronries, and Terneries of which Cumbrian men are proud, continue to flourish as a whole; but the eggs of *Larus ridibundus* are shamefully plundered on Bowness Moss, and the colony of this species at Salta Moss has suffered cruelly of late, every nest being empty on the occasion of a visit in June last.

The foregoing remarks will be understood to convey our sense of anxiety on behalf of the scarcer birds that seek to breed with us; and we can only trust that all the members of this Association will employ their influences in the right direction.

We now pass on to consider the more important facts regarding Waders and Wildfowl in the winter 1887-8, and the autumn 1887. The winter brought us a good season for wildfowl; it is true that Wigeon (*Mareca penelope*) were unusually scarce, but some other species were exceptionally abundant. This was true of the

Goosander (*Mergus merganser*), but applies with greater force to the common Goldeneye (*Clangula glaucion*). One wintry day in February last, when the northeaster was drifting the snowflakes into great puff balls on Burgh, we observed flocks of twenty and thirty Goldeneyes on the Eden estuary. The same day we noticed a gaggle of about thirty geese, which proved to be Pinkfooted Geese (*Anser brachyrhynchus*). Formerly, our evidence regarding this Grey Goose was meagre; and the credit of determining its irregular visits to Rockliffe Marsh remains with that excellent and helpful observer, Mr. A. Smith of Castletown. It has occurred occasionally on the lower Solway, and also inland, but is on the whole a very sparing visitor to our estuaries, where the Bean Goose (*Anser segetum*) is the only really common Grey Goose at the present time. Of greater interest is the fact that last winter brought us some examples of Bewick's Swan (*Cygnus bewicki*), a single bird being killed on the Solway, and others shot on Ullswater by Mr. W. H. Parkin of Ravencragg. These last, together with another shot at Lowther, were examined by Mr. Edward Tandy, and received determination at our hands whilst still freshly mounted. We are further indebted to Mr. Edward Tandy, for bringing to light a recent occurrence of the Grey Lag Goose (*Anser ferus*), now a scarce bird in Cumberland. In taking leave of the Anatidæ, it is our duty to remark that the exceptional immigration to British shores of the Longtailed Duck (*Harelda glacialis*), to which we were the first to direct public attention, affected to some extent the Solway. On and after October 10th, their presence was noticed at Silloth, and before Christmas nearly a score were killed on the English side of the firth. We also ascertained, and reported to Mr. R. Service, the naturalist in charge of the Scottish Solway, the occurrence of several immature birds on his side of the water. Before Christmas, we had ourselves examined in the flesh about half a hundred birds of this species. Nearly all of these were immature, as were four whose flight and quick diving we watched one bleak day last November on the banks of a weird highland loch.

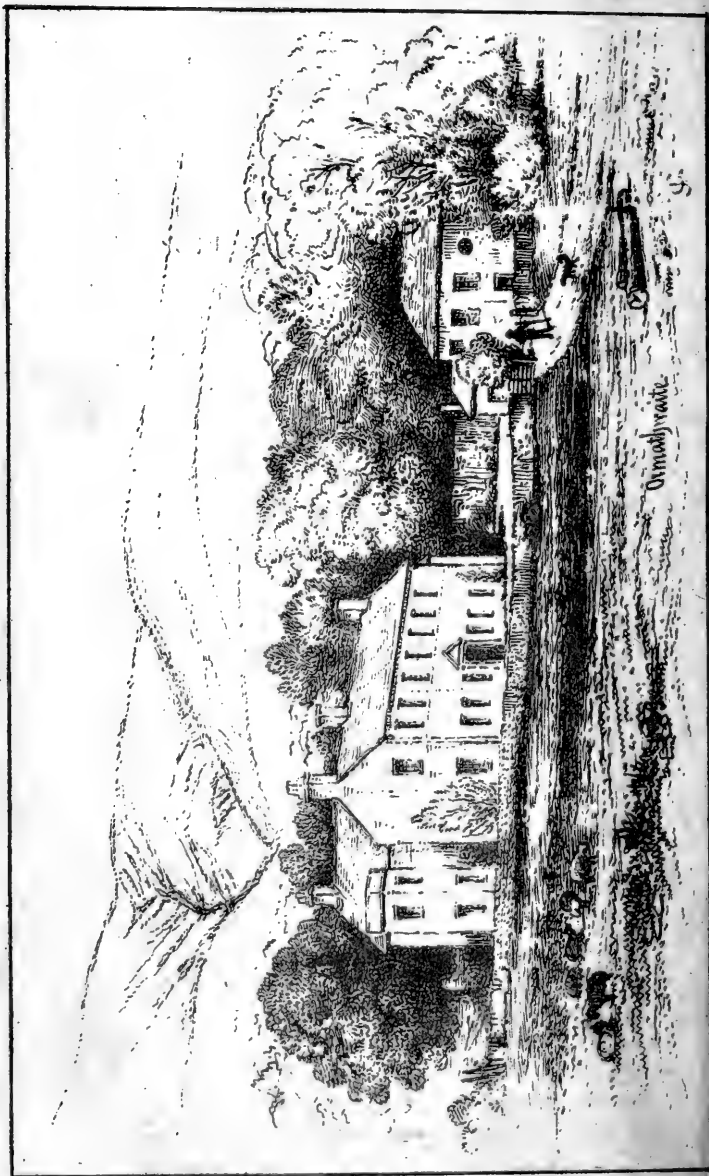
Present limits forbid that we should dilate either on the Velvet

Scoters (*Oidemia fusca*) which visited us last winter, or on recent occurrences of the Blackthroated- and the Great Northern- Divers, both scarce in our region.

In autumn, our estuaries were alive with Limicolæ, including the Grey Phalarope (*Phalaropus fulicarius*) observed by Mr. Tandy on September 22nd, near Silloth. The east coasts of Great Britain were favoured with hosts of Curlew, Sandpipers, Little Stints, and Grey Plover; but our western estuaries were not similarly affected as regards the two first, nor was a single specimen of *Tringa minuta* obtained on our side of the Solway, but Grey Plover (*Squatarola helvetica*) and Bartailed Godwits (*Limosa lapponica*) occurred during the autumn in *exceptional* numbers. The principal rush reached the Waver on September 3rd, as observed by Mr. Tandy. It was not until October 25th that we were able to visit the Solway with Mr. H. P. Senhouse, always enthusiastic in the study and chase of wary waders; but despite seven weeks of hard shooting, many Grey Plover still remained, and a few wintered on this sheltered lagoon. Some old Grey Plover killed there on September 15th, and sent to Mr. Mackenzie of Carlisle, still retained much of their handsome summer plumage.

We are well aware that we have fully reached the space assigned to our record, and shall therefore refer only briefly to two ornithological occurrences. The most recent is identical with the irruption of Pallas Sandgrouse (*Syrrhaptes paradoxus*). Concerning this, we propose to give separate details, and will only here record our regret that our unsparing efforts to preserve the birds from destruction proved a failure, twenty-one individuals being killed in Cumberland up to June 10th. The earlier occurrence is that of the Isabelline Wheatear (*Saxicola isabellina*) shot at Aigle Gill, near Allonby, in November last, by Messrs. Mann, as recorded by us in the "Ibis" for January last. We had ventured to predict the occurrence of south-eastern birds in that locality and at that time. That a new species has thus been added to the fauna of Western Europe, is an excellent illustration of what may be accomplished again and again by such lynx-eyed field naturalists as our kind friends at Aigle Gill.





Ormsbyville

SOME OF THE OLD FAMILIES IN THE PARISH
OF CROSTHWAITE:

THE BROWNRIGGS OF ORMATHWAITE, &c.

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

(Read before the Keswick Society.)

IN undertaking another paper on the Old Families in the Parish of Crosthwaite, I find that I have undertaken a more difficult task than I anticipated. The materials are scanty, and the time required in searching for them is more than I have had at my disposal. I have, however, decided to draw your attention in this paper to the family of Brownrigg, and to give you such facts as I have been able to gather, which I hope may not prove altogether uninteresting to the members of this Society. For this information I naturally go first to the parish registers. We here find the different estates upon which the family resided before they finally settled at Ormathwaite, where the last of the family, William Brownrigg, Esq., M.D., F.R.S., so long resided, and died in the first year of the present century, leaving no descendants.

The first burial of which I have a note is dated—

“1607, Feb. 23rd.—Christopher Brownrigg of Milnbecke.”

Then follows :—

“1640, March 20th.—William Brownrigg of Milnbeck. Quier.”

“1669, July 22nd.—William Brownrigg of Milnbeck. Quire.”

The first Brownrigg of Ormathwaite mentioned is—

“1677, Sept. 1.—An Brownrigg of Ormathwaite. Quire.”

Then follow :—

- “ 1681, Feb. 22nd.—Gawine Brownrigge of Milnbeck. Quire.”
 “ 1681, Mch. 20th.—Richard Brownerigge, son of George. Quire.”
 “ 1683, Feb. 10th.—John Brownerigge of High Rowe. In Church.”
 “ 1684, Aug. 24th.—Isabell Brownerigge. In Quire.”
 “ 1686, Aug. 16th.—Elizabeth Brownerigge, wife of George. Quire.”
 “ 1691, Feb. 1.—George Brownerigge wife. Quire.”
 “ 1695, March 16th.—George Brownrigge daughter. Quire.”

In the register of births we find the Brownriggs at Scalebeck, and at the Green, now called Underscar :—

- “ Baptism, 1575-6, Jan. 22nd—Of John Brownrigg, son of Christopher Brownrigg of Skelbeck and Janet his wife.”
 “ 1577, April 28.—William Brownrigg, son of Christopher Brownrigg of Skilbeck and Janet his wife.”
 “ 1582, Feb. 18.—Christopher Brownrigge, son of Christopher Brownrigg of Grene and Janet his wife.”
 “ 1585, July 25th.—Mabell Brownrigg, daughter of Christopher Brownrigg and Janet his wyfe.”

From the foregoing entries it would seem that the Brownriggs resided upon different farms in Underskiddaw, all of which ultimately became the property of the family, and possibly they were the original owners, except Millbeck Hall, which from the inscription on a stone over the front door,* shows that in the year 1592 it was the property of Nicholas Williamson. After that date, it also became their property.

Like many other Cumberland families, the Brownriggs had descendants who settled in Ireland. Notably, Henry Brownrigg, of Yerton in Cumberland, who was the first of a family settled at Rockingham in the county of Wicklow. His second son Robert, a General officer in the Army, a Knight Grand Cross of the Bath, and Governor of Landguard Fort, was created a Baronet March 9th, 1816. He was succeeded by his grandson, Sir Robert James

* The inscription is as follows :—

1592. QVORSVM, MV
 VIVERE-MORI-MORI-VIVERE.
 NICHOLAS WILLIAMSON.

Brownrigg, as second baronet, 27th of May, 1833, and was living in 1850. I mention this family, because George Brownrigg of Ormathwaite married Mary Brownrigg, daughter of Henry Brownrigg, Esq., of Wingfield, in Ireland.

The Brownriggs always held a prominent position in the parish of Crosthwaite, and their names are found as taking part in all parochial business.

In 1735 we find George Brownrigg one of the eighteen sworn men, governors of the ancient Free School; and in the year 1749 we have *Mr.* George Brownrigg acting as foreman of the Trustees.

In the year 1693, we have this remarkable combination of names, each acting as trustees of the Free School, viz., Thomas Calvert, Daniel Stanger, and Francis Raisley. The only representative of these three names now left in the parish is Mrs. Stanger of Fieldside.

The last of the Brownriggs of Ormathwaite was William Brownrigg, M.D., F.R.S., whose medical education commenced at London, where he attended medical lectures two years. He then proceeded to Leyden, and had the degree of Doctor of Medicine conferred upon him in 1737. He was born at Highclose Hall, in Cumberland, March 24th, 1711, and was therefore twenty-six years of age when he took his degree. To that university, which had obtained unrivalled celebrity, medical students generally resorted; and from it they derived the greatest improvement and the highest honours in their profession. In this learned seminary, the doctor remained several years, and studied the theory and practice of physic, anatomy, botany, and experimental philosophy, under the auspices of their respective most illustrious professors—Boerhaave, Albinus, Van Royen, and others. To these, his intimate friends and revered preceptors, he dedicated with affection and respect his elaborate thesis, *De Praxi Medica incunda*; an enquiry well adapted to the situation of one who, conversant with the theory, was about to engage in the practice of medicine.

As soon as Dr. Brownrigg had entered upon the practice of medicine at Whitehaven, he began with judgment and perseverance to put in execution the plan which he had laid down; and among

other enquiries, the damps or exhalations arising in coal mines with which that town is surrounded, appeared to him deserving of careful and accurate examination. So extraordinary were these effects, that he employed much of his leisure time in investigating their properties. Earnestly solicited by the late Sir James Lowther, Bart., proprietor of the mines, to engage in this arduous undertaking, he was encouraged in the prosecution of it by motives of humanity, justly supposing that a more extensive acquaintance with subterraneous exhalations might lead to the discovery of some more effectual method for preventing their dreadful consequences, and for rendering them less fatal and destructive.

With a view to excite the attention of philosophers to such subjects, and to promote a spirit of experimental enquiry, he wrote several essays on those exhalations, which, in the year 1741, were presented by Sir James Lowther to the Royal Society of London, by whom they were received with distinguished approbation; and the doctor was in consequence unanimously elected a member of that learned body. To these essays, then transmitted to the Royal Society, he added, in the year 1746, another, in the form of a letter to Sir James Lowther, containing an account of a laboratory which he had erected in the neighbourhood of Whitehaven. By favour of Sir James Lowther, it was supplied with a constant stream of inflammable air, or fire damp. In this laboratory many curious experiments were made upon that subtile body; and by its application, as a substitute for fire, several chemical operations performed, requiring a long continued and determined degree of heat. According to a method discovered by Mr. Carlisle Spedding, the fire damp was conveyed up an adjacent pit, from which it was conducted through a leaden pipe to Dr. Brownrigg's laboratory. For its reception he invented several furnaces of such construction as to be capable of affording the most intense, or the most gentle, heat. In the prosecution of his inquiries he experienced occasional interruptions from certain irregularities in the quantity and motion of the fire damp, which were the effect of

a sudden transition of the atmosphere, either from a rarified to a dense, or from a dense to a rarified state.

The honour which the Royal Society proposed to confer upon Dr. Brownrigg, by inserting these essays in their Philosophical Transactions, was declined by him, as it was his intention to publish them on some future occasion, enlarged and improved by many additions and corrections.

Desirous also that his observations should be confirmed not only by his own experiments, but by the attestation of others, he solicited and received the opinions of many of his literary friends, particularly of Sir Hans Sloan and Dr. Hales. Furnished with necessary materials, and qualified for the execution of so difficult a task by his indefatigable perseverance and his attachment to chemical philosophy, he long had it in agitation to write a general history of fire damp. With this motive, he retired from his professional avocations to his paternal seat, Ormathwaite. The outlines of his history of damp having been sent to Dr. Hales for his private perusal, were submitted by that celebrated philosopher to the inspection of the Royal Society; but, notwithstanding the importunities of those who were able to appreciate their merits, he could never be prevailed upon to give his consent to their publication. An incontestable argument, however, of his attention to the properties of damp, and the deference which was paid to his judgment, arises from his being frequently consulted when an explosion in mines was apprehended. By observing the degree of rapidity with which the mercury descended in the barometer, he could foretell the exact period of an explosion; and his predictions were too often verified by some melancholy event.

The only work which he permitted to be published on the subject of damp was, "An Extract of an Essay on the Uses of a Knowledge of Mineral Exhalations, when applied to discover the principles and properties of mineral waters, the nature of burning fountains, and those poisonous lakes called Avernî." This ingenious tract was read before the Royal Society in April, 1741. The object of it is to prove that the distinguishing qualities of mineral waters depend on a particular kind of air which forms a consider-

able part of their composition ; and that this air differs in no respect from the choke- or fire damp.

This experimental enquiry was considered by the Royal Society of so singular and important a nature, that to the ingenious author of it, as the best publication of the year, Sir Godfrey Copley's honorary medal was adjudged.

In the year 1748, Dr. Brownrigg published his valuable work entitled, "The Art of Making Common Salt, as now practised in most parts of the world ; with several Improvements in that Art for the use of the British Dominions." He was prompted to undertake this arduous task from a general desire which at that period prevailed in the nation to promote and extend the British fisheries, and, by this measure, to find profitable employment not only for great numbers of seamen who, on the restoration of peace, had been discharged from the service of their country, but also for the natives of the north of Scotland.

Dr. Campbell in his political survey of Great Britain, noticing Dr. Brownrigg's treatise upon Salt, calls it "a very learned, ingenious, and solid performance, than which," he adds, "there is not perhaps anything more concise or more correct in any language."

This work was so highly approved by the Royal Society, that they conferred upon Dr. Brownrigg the singular honour of directing an abridgment of it to be made by Mr. William Watson, a worthy member of that learned Society, which they published in Vol. 46 of their Transactions.

The metal Platina di pinto, *juan blanco*, or white gold, was the next object of Dr. Brownrigg's attention. The first specimens of this article having been originally carried from Carthage, in New Spain, to Jamaica, were brought to England in 1741 by Mr. Charles Wood, and were given by him to his relative Dr. Brownrigg, who presented them to the Royal Society in 1750, accompanied with an accurate and ingenious account of its origin and properties, which was inserted in Vol. 46 of their Philosophical Transactions, under the title of "Several Papers concerning a New Semi-metal, called Platina." Platina has been improperly styled

a semi-metal ; for, when all extraneous substances are removed, it possesses the distinguishing qualities of a metal, viz., malleability and fixity.

While engaged collecting materials for this paper, my attention was drawn by two of our lady members—Mrs. Leitch and Miss Mitchell—to an article in “Good Words” for July, 1885, from the pen of Mrs. Mary Howitt, entitled, “Some Reminiscences of my Life,” in which there is the following notice of Dr. Brownrigg, which appeared to me to be so interesting that I have extracted it at length, and it runs as follows :—

On December 13th, 1750, William Brownrigg, M.D., F.R.S., (through William Watson, F.R.S.,) presented to the Royal Society in London specimens of platina, a new metal hitherto unknown in Europe, and stated in an accompanying memoir : ‘This semi-metal was first presented to me about nine years ago by Mr. Charles Wood, a skilful and inquisitive metallurgist, who met with it in Jamaica, whither it had been brought from Carthagena, in New Spain.’

My grandfather, who was thus the introducer of the extremely useful metal, platina, was the brother-in-law of the learned Dr. Brownrigg, residing at the family estate, Ormathwaite Hall, Cumberland. The great-grandfather, Gawain Brownrigg, of Ormathwaite, had married an Irish lady, one of seven sisters, which led to the relationship with the Annisley and Esmonde families. Charles Wood returned home a widower, and married Dr. Brownrigg’s sister Jemima, a lively, fascinating lady, who had also been in Jamaica, and was the widow of Captain Lyndon, of the *Dolphin*, a slave ship. She had one son named Roger—another son, Charles, had been lost at sea.

My grandfather built and resided at Low-mill ironworks, near Whitehaven. There his six children by his second marriage were born. From Cumberland he removed to South Wales, and became active in establishing the important Cyfarthfa ironworks, near Merthyr Tydfil.

After my grandfather’s death the family continued to reside at Cyfarthfa, Roger Lyndon and his half-brother, William Wood, being engaged in the works. The eldest daughter Mary, *adopted* by her uncle Brownrigg, had remained in Cumberland. She was distinguished for her good looks, and had many admirers, amongst others young Mr. Wilberforce. She did not, however, encourage the addresses of the future renowned philanthropist, from the notion that ‘she could do better for herself,’ and ended by marrying the Rev. Thomas Wilkinson, vicar of Thetford, Norfolk.

Mrs. Howitt is incorrect in the christian name of Mr. Wilkinson. He published in 1810 “Select Views in Cumberland, Westmorland,

and Lancashire," by the Rev. *Joseph* Wilkinson, rector of East and West Wretham, in the county of Norfolk, and chaplain to the Marquis of Huntley." This is now a rare work, but there are two copies in this neighbourhood which I have seen—one in the possession of Mrs. Stanger of Fieldside, and the other of Mr. Smith of Skiddaw Lodge. It was published by Ackerman, London.

But to return to Dr. Brownrigg's work. In the year 1771, the appearance of the plague in some of the most distant parts of Europe had produced a general apprehension lest it should, as was formerly experienced, very widely extend its fatal ravages. The expediency of amending the laws, as a barrier against this destructive malady, was announced by His Majesty and the whole British legislature. Upon which occasion, Dr. Brownrigg observing their defects, and actuated by principles of duty and humanity, was prompted to offer to the public a treatise entitled "Considerations on the Means of Preventing the Communication of Pestilential Contagion and of Eradicating it in Infected Places." As the apprehension of danger was soon, happily, removed, this treatise and its advice did not receive from the legislature that attention which has since been given to provide more effectual security against the introduction and communication of pestilential contagion.

In the year 1772, Dr. Brownrigg was visited at Ormathwaite by Dr. Franklin, the great American statesman and philosopher, then about sixty-six years of age.

Dr. Brownrigg, in the presence of Dr. Franklin and Sir John Pringle (who was also on a visit at his house) performed an experiment of a very curious nature upon Derwent Lake. On pouring a small quantity of oil into the lake during a great commotion of the water, the surface in a short time became perfectly smooth. This extraordinary effect having been originally noticed by Dr. Franklin, was suggested by him to Dr. Brownrigg. Soon after his departure from Ormathwaite, Dr. Franklin transmitted to Dr. Brownrigg a letter, dated London, November 7, 1773, in which he gave a full and circumstantial relation, not only of every experiment which he had made at different periods for ascertaining

this remarkable property of oil, but also of the various incidents which had led to the discovery. An extract from this letter, and also from two others on the same subject—one from Dr. Brownrigg to Dr. Franklin, and the other from the Rev. Mr. Farish of Carlisle to Dr. Brownrigg—was inserted in Vol. 64 of the Philosophical Transactions for the year 1774.

Through the good offices of our townsman, Mr. F. W. Banks (now resident in London), I had these extracts copied out by one of the officials at the British Museum, as well as an obituary notice of Dr. Brownrigg from the "Gentlemen's Magazine," but I find them too lengthy to insert in full, but extract the following :—

(Extract from a Letter of Dr. Brownrigg to Dr. Franklin, dated Ormathwaite, January 27th, 1773.)

By the enclosed from an old friend, a worthy clergyman at Carlisle, whose great learning and extensive knowledge in most sciences would have more distinguished him had he been placed in a more conspicuous point of view; you will find that he had heard of our experiment on Derwent Lake, and has thrown together what he could collect on that subject; to which I have subjoined one experiment from the relation of another gentleman.

(Extract from a Letter of Rev. Mr. Farish to Dr. Brownrigg.)

I was some time ago with Mr. Dun, who surprised me with an account of an experiment you had tried upon the Derwentwater, in company with Sir John Pringle and Dr. Franklin. According to his representation, the water, which had been in great agitation before, was instantly calmed upon pouring in only a small quantity of oil, and that to so great a distance round about the boat as seems a little incredible. I have since had the same account from others, but I suspect all of a little exaggeration. Pliny mentions this property of oil as known particularly to the divers, who made use of it in his days in order to have a more steady light at the bottom. The sailors, I have been told, have observed something of the same kind in our days—that the water is always remarkably smoother in the wake of a ship that hath been newly tallowed than it is in one that is foul.

Old Pliny does not usually meet with all the credit I am inclined to think he deserves. I shall be glad to have an authentic account of the Keswick experiment; and if it comes up to the representations that have been made of it, I shall not much hesitate to believe the old gentleman in another more wonderful phenomenon he relates, of stilling a tempest only by throwing up a little vinegar in the air.

Mr. Pennant also mentions an observation of the like nature made by the seal-catchers in Scotland (Brit. Zool., Vol. iv.—Article, 'Seal.') When these animals are devouring a very oily fish, which they always do under water, the waves above are observed to be remarkably smooth; and by this mark the fisherman know where to look for them.

(Note by Dr. Brownrigg.)

Sir Gilfred Lawson, who served long in the Army at Gibraltar, assures me that the fishermen in that place are accustomed to pour a little oil on the sea in order to still its motion, that they might be able to see the oysters lying at its bottom, which are there very large, and which they take up with a proper instrument. This Sir Gilfred had often seen performed, and said the same was practised on other parts of the Spanish coast.

(Extract from a Letter of Dr. Franklin to Dr. Brownrigg.)

London, November 7th, 1773.

Dear Sir,—I thank you for the remarks of your learned friend at Carlisle. I had when a youth, read and smiled at Pliny's account of the practice among seamen of his time, to still the waves in a storm by pouring oil into the sea, which he mentions, as well as the use made of oil by the divers; but the stilling of a tempest by throwing vinegar into the air escaped me.

Perhaps you may not dislike to have an account of all I have heard, and learnt, and done.

In 1757, being at sea in a fleet of ninety sail bound against Louisbourg, I observed the wakes of two of the ships to be remarkably smooth, while all the others were ruffled with the wind. I pointed it out to the captain, and asked him the meaning of it. 'The cooks,' says he, 'have, I suppose, been just emptying their greasy water through the scuppers, which has greased the sides of those ships a little.'

Afterwards being again at sea in 1762, I first observed the wonderful quietness of oil on agitated water in the swinging glass lamp I made to hang up in the cabin. An old sea captain then a passenger with me, thought little of it, supposing it an effect of the same kind with that of a little oil put on water to smooth it, which he said was a practice of the Bermudians when they would strike fish which they could not see if the surface of the water was ruffled by the wind. The same gentleman told me he had heard it was a practice with the fishermen of Lisbon, when about to return into the river, if they saw too great a surf upon the bar, to empty a bottle or two of oil into the sea, which would suppress the breakers, and allow them to pass safely. Discoursing of it with another person who had often been in the Mediterranean, I was informed that the divers there who, when under water in their business, need light,

which the curling of the surface interrupts by the refraction of so many little waves, let a small quantity of oil now and then out of their mouths, which, rising to the surface, smooths it, and permits the light to come down on them.

In his retirement at Ormathwaite, among other chemical studies, mineralogy was by no means neglected. His cabinet contained several rare metallic and fossil substances; and he was well acquainted with all the subterraneous productions of Cumberland; which in number, value, and curiosity are not inferior to those of any other county. To the minerals found in the neighbourhood of Keswick he paid particular regard. Having judiciously selected, he carefully analyzed the ores of black jack, i.e. zinc, and black-lead, i.e. plumbago, extracted from the mines at Borrowdale, in order to discover their original properties and qualities; and the public was much disappointed in not receiving the result of his accurate inquiries.

Many of his leisure hours were employed in agricultural improvements, which contributed not only to his private advantage in rendering his own estates more productive, but also to the inhabitants of Keswick and its vicinity; as in consequence of the methods which he suggested of draining and cultivating lands, the fertility of the soil has been considerably increased.

His pupil and biographer, Dr. Dixon, says:—"In this retirement he also indulged that passion for polite literature which had never been entirely sacrificed to more interesting pursuits. Much of his time was devoted to the perusal of the ancient and modern poets, which had often been to him a source of relaxation and amusement when engaged in severer studies. But influenced by religious motives, and admiring sublimity of conception, he read with serious care the sacred poets, whose compositions are far superior in unaffected grandeur of style, genuine pathos, and in elevation of sentiment, to the most celebrated productions of unassisted reason.

"From this general statement it may be properly inferred that Dr. Brownrigg was possessed of every qualification necessary to form a chemical philosopher, a dogmatic physician, and an elegant scholar. By his conduct in a civil capacity, which required

different talents, he acquired additional honour. Long in the commission of the peace, an acting magistrate for the county of Cumberland, he discharged the duties of that important station not less with credit to himself than advantage to the community."

In the "Gentleman's Magazine," Vol. 70, part 1, pp. 386-7, there is an obituary notice from which the following extract is taken:—

1800, Jan. 7th. At his seat at Ormathwaite, near Keswick, Co. Cumberland, in his eighty-ninth year, the great and good William Brownrigg, M.D., F.R.S. To this place he had retired about twenty years since, withdrawing himself as much from the practice of phisick as his numerous connexions, his high character, and his friendliness of disposition would permit him; and purposing to divide his time and his taste between the romantic scenery of this delicious spot, and the profounder researches into that department of Natural Philosophy, which was already considered as his peculium. As it was Mr. B's lot to choose his own profession, so he began his career under the most auspicious omens. The medical science of the University of Leyden was at that day shining in its highest noon. Albinus in Anatomy, Euler in Mathematicks, and other great names in the collateral sciences, thronged round the chair of Medicine and Chemistry, so ably occupied by the ingenious and indefatigable, the accomplished and instructive Beorhaave. Having made at Leyden a long and happy residence, and taken an honourable degree, he returned to his native country, and, in Whitehaven, married a lady of singular good sense, much information, and great vivacity; of a disposition most hospitable, manners most polite, of affections most warm and liberal, and possessing an address so versatile and superior as never failed to charm in whatever circle it was exerted.*

He was author of an inaugural treatise, 'De Praxi medica incunda,' 1737. Of a treatise 'On the Art of Making Common Salt,' printed at London in 1748, which procured for him the additional F.R.S.; a book now long out of print, but not of recollection, since it is by foreign chemists as well as by natives, by M. Chaptal as well as by our own Dr. Watson, cried up for its profound variety of excellence, and lamented for its scarceness. He also published 'An Enquiry concerning the Mineral Elastic Spirit contained in the Water of Spa, in Germany,' Philos. Trans. Vol. 55; and lastly, a treatise published in 1771, in octavo, 'On the Means of Preventing the Communication of Pestilential Contagion.' All which Dr. B. has effected by producing the various combinations of gases and vapours which constitute atmospheric air, and separating into many forms this long supposed one and indivisible, whilst he solidified its fluid

* This lady was Mary, daughter of John Spedding, Esq., whom he married Aug. 3rd, 1741.

essence into a hard substance. Whatever rapid genius may claim as his own, that Dr. Brownrigg was the legitimate father of these vast discoveries, was not only known at the time to the doctor's intimate and domestic circle, but also to the President of the Royal Society, Sir John Pringle; who, when called upon to bestow upon Dr. Priestly the gold medal for his paper of 'Discoveries of the Nature and Properties of Air,' thus critically observes: 'And it is no disparagement to the learned Dr. Priestly that the vein of these discoveries was hit upon, and and its course successfully followed up, some years ago, by my very learned, very penetrating, very industrious, but too modest friend Dr. Brownrigg.'

To habits, indeed, of too much diffidence, and to too nice scrupulosity of taste, formed, perhaps, in the absence of keen animal spirits, the world has to attribute the fewness of his publications, and the difficulties which always impeded his road to the press. Had our Doctor's productions been allowed to make their own way into the world in due time, many a jay would have been plucked of his plume, and another philosopher of the western hemisphere had not been tempted to publish notes and observations which had been taken down at Ormathwaite, and to give them to the world without the candid addition of the date of their origin.

The writer of this article says he had "grounds for believing that a General History of the County of Cumberland was one of the Doctor's literary projects, and that he had made several arrangements subservient to such an undertaking, particularly in the department of Natural History."

"Advanced in years, and increased in honours as he was, no Swiss ever pined more ardently for his native mountains and lakes than Dr. Brownrigg. The entreaties and solitudes of the unhealthy, and the anxious prayers of a fond wife, might perhaps have retarded, but could not prevent his departure from Whitehaven, and sole residence at Ormathwaite.

"The Doctor was overjoyed to see his native country become the object of travel, and the topic of praise and admiration; and observed with delight the taste for foreign tours cried down, whilst the new, the romantic, and the remote in our own island lay unexplored. It gladdened the heart of the veteran herbalist to behold young troops of both sexes ransacking the fields for botanic rarities; and he seemed to congratulate with the spirit of Boerhaave when informed that Chemistry, always acknowledged as the most important, was now coming forth as the most popular of the

sciences. To these circumstances of gratification, it was a fortunate accession that at this time, a good scholar, and an amateur of the romantic, and a follower of the muses, by reason of prudence as well as by choice of affection visited the doctor. He was soliciting subscriptions for a Day Book of Antiquities.

“He gained his object, and more than his object; for our doctor finding the reverend Jesuit capable of making a popular book, and not indisposed to incur the labour for the sake of the reward, laid the plan of the Tour to the Lakes, and eagerly set Mr. West forward in the execution. The publication of this little book has answered the purposes of all concerned. It has had a great sale; it has sent shoals of visitors to the neighbourhood of Keswick; and, though the author (so it has pleased Providence) was only allowed a glimpse in prospect of the success of his labours, and, perhaps for the first time in his life, to cherish for a moment the hopes of affluence, the projector of the plan has seen his passion for the improvement and notoriety of Keswick gratified; and the village is now become a post-town, a considerable market for a populous and opulent neighbourhood, and an annual fashionable resort for the learned and the ignorant, the rich and the curious, the young and the old, for him who wants exercise, and for he who is worn out for want of relaxation. To occasional intenseness of thinking, and profound abstraction from external objects, he had always been subject; but as years multiplied, as bodily exercise became irksome, and as, by retiring from public business, he drew back from the occasion of fresh ideas, his intellectual powers seemed to turn the more in upon themselves, and the more eagerly to destroy their own energies. Mrs. Brownrigg was of a delicate frame, and too irritable habits to see without the symptoms of mortal anxiety the melancholy degradation of her husband's understanding. Her earthly existence seemed involved in his mental superiority. As that declined and mouldered away, so did she. And how true were their mutual sympathies may be judged hence, that the last symptoms of worldly feeling which he showed were a flood of tears when the corpse of his excellent wife was

brought forth for her funeral. After this event, he walked about under the care of a couple of valuable relatives, for about five years, a monument of departed genius, but a picture of the most assiduous good manners, of perfect politeness of deportment, and of all the urbanities which adorn the gentleman and the scholar. Strange, very strange, that these manners and dispositions should so long survive the occasions and habits which gave them birth. But stranger still it was, that amidst the general wreck of all thought, and dissolution of every association of sensible ideas, a notion of religion should show itself to the last ! Upon his own earnest entreaty, he was allowed by his attendants to resort to the place of public worship. He was precise, collected, devout and fervent, compared with what, a few minutes before, he was without those walls : he seemed as one of the just made perfect. And when he returned, he evinced a power of retaining somewhat of the comforts, as well as the ideas, which God had bestowed from His holy place.

“ Indeed the religious sentiment was always uppermost with the good doctor. And in his brightest days, though the classics of Greece, Rome, and Britain were present to his fancy, and enlivened and enriched his conversation, yet the sacred Scriptures were the topics of his delight, and the object of his veneration. And as his quotations of his Virgil and Milton bore testimony to the elegance of his taste and the fervour of his genius, so, when Job and Isaiah were brought forward, he showed what his imagination would aspire at in the ranges of sublimity. In philosophical disquisitions, the *fiat* of God he pronounced to be the last link in the chain of effects and causes ; and to the Word of God he bowed as to the first moving power in the system of moral action. In the ordinary occurrence of good things, he never failed to give God the praise ; and in the more solemn dispensation, he closed his observations, or repressed his feelings, by a purpose of resignation to God’s will. Thus lived and thus died this great and good man.”

When Crosthwaite Church was restored by the munificence of the late James Stanger, Esq., a very neat marble tablet was erected

at the east end of the Church by the late John Spedding, Esq., J.P., of Mirehouse, which bears the following inscription :—

WILLIAM BROWNRIGG, M.D., F.R.S.,
A PHYSICIAN AND PHILOSOPHER EMINENTLY DISTINGUISHED,
DIED AT ORMATHWAITE, JANUARY 6TH, 1800,
AGED 88 YEARS.

MARY, HIS WIFE,
THE DAUGHTER OF JOHN SPEDDING OF WHITEHAVEN,
DIED AND WAS BURIED NEAR THIS PLACE,
FEBRUARY 17TH, 1794.

THEY HAD NO CHILDREN.

NOTE.—For the sketch of ORMATHWAITE, the residence of Dr. Brownrigg, I am indebted to my friend Mr. E. I. Grayson of West Cross, Swansea. The detached building was Dr. Brownrigg's laboratory, and little, if any, alteration has been made on the premises since his day.—J. F. C.

THE BIRDS OF OUR MARSHES.

BY J. N. ROBINSON, OF CARGO.

(Read before the Carlisle Society.)

THE scope of the present paper is intended to furnish a brief survey of the avifauna of Burgh and Rockliffe Salt Marshes, including an area of several thousand acres of pasture land, drained by numerous winding creeks which frequently mislead strangers, and occasionally engulf unfortunate cattle in their treacherous bottoms. These marshes are respectively situated upon the right and left banks of the river Eden, but are flanked by the united waters of Esk and Eden. The edges of Burgh Marsh undergo constant demolition from the tide, which is at present increasing the area of Rockliffe Marsh. Both marshes lie within an easy distance of my home, and have consequently afforded me very many opportunities of studying their bird-life.

The marshes are devoid of any but the scantiest covert, and though stray migrants occasionally shelter in the drier creeks in stormy weather, yet in the main such insectivorous birds as visit the district are forced to search for food and shelter in the hedges and plantations at some distance from the marshes—of course there are exceptions. The Wheatear (*Saxicola ananthe*), for example, visits the edges of the marsh abutting on the water both in spring and autumn; the Dipper (*C. aquaticus*) occasionally appears at the mouth of the Eden during the first months of winter; the Pied Wagtail (*M. lugubris*) secretes her nest among

the piles supporting the bridges which span the creeks; and its rarer relative, the White Wagtail (*M. alba*), has been observed on Burgh in September, resting on migration (Macpherson).

An interesting bird which nests sparingly on Rockliffe Marsh is the Rock Pipit (*A. obscurus*); far more numerous at all seasons, however, is the well-known Meadow Pipit (*A. pratensis*), which is only rivalled in numbers by the Skylark (*Alauda arvensis*). The Skylark seems to find abundance of food on the salt meadows throughout the year, and generally rears two broods in a season, the first broods flying about the middle of May. Frequenting the same broken ground as the Skylark, the Snow Bunting (*P. nivalis*) appears in flocks, but more frequently in twos and threes, about the beginning of November, and stragglers linger until the end of March.

One species constantly to be seen in large droves upon the marshes during early autumn is the Starling (*S. vulgaris*); indeed some individuals are present throughout the year.

A less welcome visitor is the Carrion Crow (*Corvus corone*), which seems to find the young birds and eggs of other species to its taste, and wages a relentless war against wounded birds. The Hooded Crow (*C. cornix*) likewise frequents the marshes in winter, but only at irregular intervals, and always singly, being on the coast, as inland, a somewhat scarce visitor to Cumberland. I have often met with specimens of the Kingfisher (*Alcedo ispida*) flying along the creeks during the dreariest periods of the year.

Coming to the Birds of Prey, I may say at once that the only Owl which I have watched in the act of hunting over the marshes is the Barn Owl (*Strix flammea*); but the Tawny Owl, the Long-eared Owl, and the Short-eared Owl also occur either on the marshes or in their immediate vicinity. Of the diurnal Birds of Prey, the Kestrel, Merlin, and Sparrowhawk are most frequently seen; but I have observed the rapid flight of the Peregrine (*Falco peregrinus*) on various occasions. This Falcon passes through the air with quickly repeated beats of the wing, which to my mind somewhat recall the action of the Wood Pigeon (*Columba palumbus*). The Falcon generally "means business" when he

visits the marshes, but occasionally he seems to condescend to effect wanton slaughter. An instance of this was observed by me in March, 1886, in the neighbourhood of King Garth, when a Peregrine struck a tame duck on the Eden, within full view of me, and contented himself with a successful stroke, not troubling to eat or carry off the quarry.

Such, then, is a slight sketch of the land birds to be seen upon these two salt marshes. Did space permit, I could treat of a good many more which have occurred at one time or another, e.g., the Redstart (*Ruticilla phœnicurus*), the Wren, (*T. europæus*), the Redbreast (*E. rubecula*), the Stockdove (*Columba œnas*), and others.* But the land birds can be studied in most localities, and the interest of the marshes of necessity centres in the various aquatic species which avail themselves of the shelter afforded to rear their young, or frequent the channels of the estuary in search of subsistence.

Of the latter number, not the least prominent is the Common Cormorant (*Phalacrocorax carbo*), a bird which never entirely deserts us, though most plentiful in winter, notably in hard weather. It is interesting to watch wild Cormorants feeding in the Eden. Their prey, which consists of small fish, is constantly obtained by diving. If a fish be seized, the Cormorant at once returns to the surface, tosses its head until the fish assumes a proper position, and then bolts it head foremost. More rarely, the fish is thrown up into the air, caught in its descent, and promptly swallowed. The majority of the Cormorants that visit the Eden are immature white-breasted birds, and it was only with some difficulty that I succeeded in supplying my collection with a really good old specimen.† Another bird which constantly fishes in the estuary is the Heron (*Adea cinerea*), Rockcliffe Marsh being one of its most favoured resorts. Yet another fish-eater is the Gannet (*Sula bassana*), but this is chiefly met with after stormy weather.

* i.e. Wrens, Redstarts, and Redbreasts take shelter in the marsh creeks while resting on migration. The Stockdove I have only seen crossing the marshes incidentally.—M.

† I have only once in all my visits to these marshes, met with the Shag, and then only with a single bird.—M.

Coming to the order of Waders, we may pass the Moor-hen (*Gallinula chloropus*) and Coot (*Fulica atra*) as sometimes seen. The Water Rail (*Rallus aquaticus*) has been shot once to my knowledge. The Common Snipe (*G. cælestis*) and Jack Snipe (*Scolopax gallinula*) are commonly found in the autumn. Woodcock (*S. rusticula*) are seen every winter. It is on Rockliffe Marsh that the Redshank (*Totanus calidris*) is seen to the greatest advantage during the nesting season, and I have had ample opportunity of studying the breeding habits of this bird. In 1887, we found the first eggs on April 16th—rather later than usual. On the 24th we found them well started, but in no nest did we find a full clutch. From the number of unfinished nests to be found in close proximity to ones with eggs, I am of the opinion that two and sometimes three are started before the birds are satisfied with their position. The nest is placed in a tuft, and is composed of a few blades of grass carelessly arranged in a slight hollow. Four eggs are the usual number, although nests have been found containing five. While on the subject of eggs, I may be allowed to enter a protest against the way in which they are annually sold as Plovers' eggs. Some hundreds are lifted every season, and I am told that sometimes as much as twopence per egg is given. So great was the competition for them last season (1887), that it was with great difficulty I was able to get a bird in down. In the nesting season, should a person come within a quarter of a mile of its habitation, it is sure to greet him with clamorous cries, and advance towards him on wing, wheeling round and round, exhibiting great alarm lest he should discover its nest or young. Its flight is light, rapid, and wavering, as if undecided, being performed by quick jerks of the wing. Although the bird is very wary during the early stages of incubation, as the eggs get nearer hatching they sit a good deal closer; indeed, so great has been the attachment of the bird for its eggs, that it has allowed me to lift it off its nest. The females are always a little larger than the males.*

* In May, 1888, Mr. D. Mason captured on its nest a Redshank, which on dissection proved to be a male. It is thus ascertained that both sexes take part in the duties of nidification.—M.

Every year a Greenshank or two (*T. canescens*) are seen ; but being very wary birds, they are seldom shot. This species searches the muddy creeks for food, often walking into the water, until it nearly reaches the tarsal joint. It runs rather than walks, and almost continually vibrating its body. Mr. Dawson has seen a bird which was shot in the Ambrose Holme, above Carlisle.

Of the Sandpipers, we have the Common Sandpiper (*Tringa hypoleucos*) as a regular summer visitant. My dates of the arrival of this elegant little bird for the last five years range between the 13th and 20th of April. The Curlew Sandpiper (*T. subarquata*) I have twice come across in summer plumage, once while looking for Dunlin eggs with Mr. Dennis Mason, and on the 23rd of May, last year, Mr. George Dawson and I had a good opportunity of watching the habits of this bird in the early morning on Rockliffe Marsh. Generally mingling with Dunlins, it can scarcely be distinguished from them : but when seen apart, they have precisely the same habits as to the mode of feeding. Its cry differs, being harsh and not so soft as that of the Dunlin. The Knot, though abounding in great numbers lower down the Solway, is very seldom seen either on Burgh or Rockliffe Marsh. That very elegant species, the Green Sandpiper (*T. œuropus*), which is sometimes met with on our marshes, is much larger than our Common Sandpiper. The Little Stint (*T. minuta*), which in form and proportion closely resembles the Dunlin, although much inferior in size and somewhat more slender, sometimes visits our marshes in autumn and the early part of winter. They are seldom seen in greater numbers than six or eight together. They can scarcely be called shy birds, as they will sometimes settle down quite close to you. One peculiarity Mr. George Dawson has noticed is, that "when walking directly up to them, they will lie flat to the ground with the tail rather erected." No Little Stints have been recorded as seen on *our* marshes for some time, nor have I ever seen the bird alive.

We come now to the Dunlin (*T. variabilis*). It breeds in some numbers on Rockliffe Marsh. The nest is usually located under the shelter of some tuft, being often concealed intentionally or

unintentionally with great success. The eggs, which always number four (I have never found more), are deposited in the nest smaller end inwards. The female sits very assiduously, allowing a person to come quite close to her before leaving the nest, which she does in a fluttering and hesitating manner. Their flight is very rapid; and it is very beautiful to see them stretching away in flocks, at one time scarcely discernible on account of the distance and their dull backs, but at the next moment glancing into light as they turn their lower surface to the view. The note of the Dunlin is feeble, but continually repeated. The female, like most Sandpipers, is considerably larger than the male. That I think is the only difference between them. This bird seems to me to be in a continual state of moult. As the breeding season draws to a close, the feathers on the breast—of which their terminal part is black—are substituted by others having a much smaller portion of their extremity of that colour. In September the grey feathers, characteristic of the winter plumage, appear here and there, and by degrees the whole is renewed. I have examined the marks left by these birds after feeding in the sand, and the place was covered by numberless small holes made by their bills. Some of these were mere hollows, not more than one-twelfth of an inch deep, while the deepest were nearly half an inch. On scraping away the sand I could find no worms or shells; going to another place, I found the sand marked in the same way, and here and there a much deeper and wider hole, accompanied by numerous scratchings. I think it is thus clear that they search for their food by gently tapping; and it appears they discover the object of their search by the kind of resistance which it gives, and then insert their bills deeper to find it. Mr. George Dawson has in his collection at Bellevue a Buff-breasted Sandpiper (*T. rufescens*), which was shot by his brother on Burgh Marsh, in September, 1876. (*B. of C.*, p. 153.)

The Curlew (*T. arquata*) is well known on our marshes in winter.* It is an extremely shy bird, and very difficult to approach within shot. I have found the Curlew nesting on a piece of waste

* Many frequent the marsh in August, probably birds bred on mosses adjacent to the Solway.—M.

ground between Beaumont and Burgh Marsh for the last two years. The Whimbrel (*T. phaeopus*), similar in everything but size, now and again appears, mostly in the spring; but it has been shot in the autumn on Rockliffe Marsh. Ruff and Reeves (*M. pugnax*) are seen every year. We have record of six shot on Rockliffe Marsh last autumn, all birds of the year. The Bartailed Godwit (*L. lapponica*), though more plentiful lower down the Solway, has been got on both marshes.

The Oyster-catcher (*H. ostralegus*), or "Sea-Piet," as it is commonly known with us, occurs in large flocks during the autumn and winter, a few pairs staying on Rockliffe Marsh to breed. They remain in flocks until April, when they disperse in pairs; and by the beginning of May a few nests are always to be found. The nests on Rockliffe Marsh are slight saucer-like hollows in the grass, generally at a short distance from the water. I have never found one among the pebbles, nor yet on the bare sand, which I believe is the ordinary nesting place of the Oyster-catcher. The eggs are three in number, but sometimes four are found.

The Lapwing (*Vanellus vulgaris*) breeds in vast numbers on our marshes; but as it must be so well known to you all, it is not necessary to give a detailed account of this bird. The Golden Plover (*Charadrius plumialis*) is with us during the autumn and winter. The same remark applies to the Grey Plover (*S. helvetica*), though it is of much rarer occurrence than the last named.* Although the Ringed Plover (*Ægialis hiaticula*) used formerly to breed on both marshes, I have never found a nest there; but I have found the birds as far up the river as Stainton gravel-bed. For the last three or four years one pair—and on one occasion two pairs—have hatched their clutches safely, except last year, when they were carried away by a flood. They formed another nest, but their eggs were unfortunately trodden on by a fisherman.

The Dotterel (*E. morinellus*) makes its appearance on our marshes (or perhaps I ought to say used to do so) early in May, in small flocks,

* i.e. "Rarer" on the upper Solway marshes, which it only visits when the tides are very high. But many Grey Plover frequent the coast line from Port Carlisle to Maryport in autumn, their numbers varying in different years.—M,

eventually settling on our mountains for breeding purposes. The arrival of four last year caused great excitement among the haaf-net fishermen on Burgh Marsh. They took their guns the next tide to shoot them—but only to find them gone. They were seen on Rockliffe Marsh the next day, but the following they were gone.

The Sanderling (*C. arenaria*), appears in small flocks as early as the beginning of September, and remains with us until the beginning of May. It is generally considered a spring and autumn visitor, but I have shot them both in December and January. On the 4th of January, last year, I shot two as far up the river as Grinsdale. I have every reason to believe that Sanderlings are frequently mistaken for Dunlins in the winter. I think it is impossible to distinguish the two at a distance, but they may easily be known when procured, by the want of the hind toe in the Sanderling.

Of the Geese, the Barnacle (*B. leucopsis*) is certainly the most common. Large flocks visit Rockliffe Marsh every winter for feeding purposes. They can only be approached under cover of darkness, when occasionally a good shot can be got; but it very often happens that after hours of patient stalking, some little mishap occurs, which gives the birds warning of their coming danger. They immediately rise with a shrill scream, which you can hear for miles as they continue their flight down the Solway. Their call is loud and shrill, but strikes agreeably on the ear when the cries of a large flock come from a considerable distance. The Brent is seen on the marshes in some years, but is quite an unusual visitor. A bird in the possession of Mr. Storey, Demesne, Castle-town, was shot on Rockliffe Marsh by John Allen, about twelve years ago. The Bean, or "Grey Goose," as it is locally called (*A. segetum*), is met with in the winter months, though Mr. Dennis Mason has shot them in the end of April. The Goosander (*M. merganser*) is a regular visitant. Being a shy and very active bird, it is not easily obtained, as it neither allows a near approach, nor usually remains above water until the shot reaches it. As it is a heavy bird, with a very flat body, it has the appearance of sitting deep in the water. It is an apt diver, and remains long under the surface. Immature males and females predominate;

but I have seen some very fine old males lately in the game shops (sent from the neighbourhood of Gretna.—M.).

Of the Ducks that frequent our marshes, the Wigeon (*M. penelope*) is perhaps the commonest.* They begin to make their appearance about the end of September, and leave us again in April. Being essentially night feeders, large numbers are shot by watching the flosches (as the small ponds of water left by the tide are called), where they come to feed as the night comes on. Mallards (*A. boschas*) are generally to be found distributed among the creeks. Teals (*Q. crecca*), though scarcer than the last named, are always to be seen during the winter months. That very beautiful bird the Shieldrake (*T. cornuta*) is permanently met with; and last season I heard of at least half-a-dozen nests that were taken in the neighbourhood of the marshes. One peculiarity I have noticed in connection with this bird is that it seems to continue in pairs all the year round, although in winter and spring it may sometimes be seen in small flocks. In spring, or during the mating season, it has a habit of erecting itself, thrusting forward its neck, and shaking its head as if it were choking or trying to swallow some hard substance; which, when seen through a glass, looks very ridiculous; but this appears to be only an act of attention to the female. Being a shy bird, and as it generally frequents the large flats of sand, it is not easily approached. Although several birds have been kept for years in a domesticated state in my district, I have never heard of them breeding under artificial conditions. The female is much smaller than the male; it also differs in wanting the knob at the base of the bill. Goldeneyes (*C. glaucion*) are to be met with from the end of October to the early part of April in fairly large numbers, especially the young and the females, which, with us go under the name of Wigeons. Goldeneyes have the faculty of sinking their bodies deeper into the water, which they do when at all suspicious of danger; but when undisturbed they float very lightly.

* I should have thought that the Goldeneye was perhaps the commonest, but the Mallard is very abundant. I fancy the *rarest* duck that visits the upper Solway is the Long-tailed Duck, which I only once met with, in November. But young birds have been shot at King Garth.—M.

An instance of the Shoveller (*S. clypeata*) breeding within a short distance of Burgh-by-Sands was recorded in 1886, and another nest was found last year. I have had specimens in the flesh since; they have all been in female plumage.

The Tufted Duck (*F. cristata*) is a rare visitor.* The Pintail, though formerly common to the marshes, is now scarce; but two have been shot within the last month on the Eden. A few Pochards (*F. ferina*) are shot every year. Scaups some years are fairly numerous; in the winter of 1886-7, for instance, there was a good number up as far as Rockcliffe Marsh—more plentiful on the Esk side than the Eden. Being essentially a sea-duck, it is not often met with far up our river; but early last December I shot a fine female as far up the Eden as the flat water between Grinsdale and the Coops stream.

Two out of the three Scoters have come under my notice. The Common or Black Scoter (*Æ. nigra*) is to be found every winter. Sometimes only a single specimen is recorded; in other years they appear in small flocks of two or three together. I saw five in March, 1886, as far up the river as Grinsdale Island. I have specimens in my collection shot by my brother, who has been more fortunate than I in shooting Common Scoters. A bird erroneously recorded as a Velvet Scoter in the "Carlisle Journal," was shot by William Railton in September last. The only Velvet Scoter (*Æ. fusca*) which I have seen in the flesh is the one which I shot on the Eden, close to my home, on the 22nd December, 1886. I had a good opportunity of observing this bird, as I watched it for more than an hour before going for my gun. The habits are exactly the same as the Common Scoter. It took several flights, but never rose more than two feet above the water; it flew with considerable speed, moving its wings very rapidly, and always alighting hind end first. It sat lightly on the water, swam with moderate speed, was a wonderful diver, and remained a long time under the water. It rose at a very small angle, striking the

* The Tufted Duck has often been shot off Burgh Marsh Point, but prefers inland waters such as afford its favourite diet of aquatic plants, which are absent from the estuary.—M.

water with its wing tips for several yards. The general colour is of course black, the head and neck having a violet sheen. A narrow strip of white extends from the front angle of the eye to a quarter of an inch behind it. On the wing is a large patch of white, which shows to advantage when flying, the greater part of the outer eleven secondaries and the tips of their coverts being of that colour.

I shall simply give a list of the Gulls I have seen on the marshes, viz:—Greater and Lesser Black-backed, Common, Black-headed, Herring Gull, and the Kittiwake. The Little Gull (*Larus minutus*) in the possession of Mr. G. Dawson was shot by him on Rockliffe Marsh in 1857, and is in winter dress.

Mr. Smith, of Castletown, shot a Buffon's Skua (*S. parasiticus*) in 1879. Another was shot by a fisherman named Baty at Stainton about three years ago. (*B. of C.*, p. 179.)

A number of Common Terns (*Sterna fluviatilis*) visit Rockliffe Marsh every May for breeding purposes. On going to their nests, one is sure to be met by several of them. As you draw near, they are all on the wing, wheeling around you, sometimes quite close to the ground, then high above you, but all the time uttering their harsh cries. They are indifferent walkers, but when on the wing their flight is easy and elegant. The Black Tern (*H. nigra*) is of rare occurrence in this neighbourhood. A bird shot by Mr. Wm. Dawson, on Rockliffe Marsh, more than twenty years ago, is now in the Bellevue collection. On the 3rd of June, last year, I had the pleasure of watching a Black Tern on the Eden. Its flight, while hawking flies off the water among the weeds, was very rapid, and its turns short.

The Puffin, Razorbill, and Guillemot have all been met with; but they have been mostly birds washed ashore, or else driven there for shelter.

Of the Grebes, the Little Grebe, or Dabchick (*T. fluviatilis*) is generally to be found. A Slavonian Grebe (*P. auritus*) was killed in rather a curious manner by Mr. Thos. Sinclair, of Rockliffe, a few years ago. While fishing for salmon on the Eden, near the Carbed islands, below Beaumont, he found his fly fast in something which he landed with great difficulty. On getting it ashore, it proved to

be a Slavonian Grebe hooked fast by the tongue. The bird had evidently taken the fly for a natural one, much in the same manner as a fish does. The only occurrence, so far as I know, of the Great Crested Grebe (*P. cristatus*) was in 1884, when a fine male bird was shot near Cargo by my brother on the 4th of March.

With this, my notes must end for the present. The Great Skua, Roseate Tern, Red-breasted Snipe, Temminck's Stint, Little Auk, and other rare stragglers have been recorded from these marshes at one time or another, but I cannot add to the particulars already supplied in the "Birds of Cumberland." The intention with which I set out has already been fulfilled, if the personal observations laid before you have enabled you to understand with some clearness the bird-life that characterises Burgh and Rockliffe Marshes. Acknowledgments for assistance received are due to various friends, especially to Mr. Smith and Mr. D. Mason of Rockliffe. Mr. G. Dawson has furnished much valuable information, and I have availed myself, freely, of reference to Macgillivray's "British Birds."

NOTE.—This MS. has been revised for the press by Rev. H. A. Macpherson, who concurs generally in the conclusions arrived at.

REPORT ON
PALLAS SAND-GROUSE (*SYRRHAPTES PARADOXUS*)
IN THE NORTH-WEST OF ENGLAND.

H. A. MACPHERSON, M.B.O.U.

BEFORE detailing the statistics regarding Pallas Sand-grouse, which constitute the *raison d'être* of the present essay, it is proposed to take a cursory glance at the general bearings of the subject, in order that such readers, as are not practised ornithologists, may be placed in a position to comprehend the interest which recent events have awakened in scientific quarters. Pallas Sand-grouse is essentially an Asiatic species, making its home in the arid Kirghis steppes, the great Gobi desert, and extending its range eastward through Mongolia to the plains between Peking and Tientsin in North China. (Elliott.) Przevalsky states that *Syrrhaptes paradoxus* "is one of the most characteristic birds of Mongolia, inhabiting not only the steppes, but also the deserts. In summer they go north, even beyond Lake Baikal where they breed, but spend the winter in the Gobi desert in such localities as are free from snow, and in Ala-shan; and from the middle of October we constantly meet with them there, sometimes in flocks of several thousands." (Rowley. Orn. Misc. I. p. 382.)

The first man to obtain a specimen was a Russian, Nicol Rytshkof, who forwarded it to Pallas, but in a mutilated condition, having lost the long tail feathers, which form so conspicuous an ornament of the species. Not having a supplementary tail, Pallas figured the specimen without one (Russ. Reichs. I. App. 712,

Tab. F. 1773), and made some shrewd remarks upon the new species, which he referred to the genus *Tetrao*. He remarks:—"Avis inter Lagopodes et Otides ambigua, multisque momentis anomala et a norma solita aliena." Attention is called to the curious feet: "Pedes maxime insoliti fere usque ad unguis plumosi, breviculi, tridactyli, digitis brevissimis, coalitis, solo apice unguibusque distinctis; unde planta triloba, latiuscula, papillis corneis imbricata." He concludes: "Habitat in deserto Tartarico australiore, unde adlatum specimen farctum transmisit nobil Nicol Rytschkof." Our countryman Latham, following Pallas, conferred on the species the title of "Heteroclite grouse."

It next concerns us to notice the first advent of *Syrrhaptes paradoxus* to the western palæarctic region, from which it had been excluded prior to 1853. It is now a fact of common information that in that year a horde of these Tartars invaded eastern Russia, and founded a permanent settlement in the neighbourhood of Sarepta. Some six years later the news came that specimens had reached the British Isles, examples being secured in Wales, in Kent, and in Norfolk (1859). These proved to have been the scouts of a large body which swept across Western Europe in 1863-4. Professor Newton, the historian of this incident, estimating the total number of the invading host at only less than seven hundred

Dr. Sclater quotes the following passage from Emile Huc's "Tartary, Tibet, and China," and though an endeavour to verify his reference has failed, it is perhaps sufficiently amusing to be worth reproducing here. "Tartary is peopled with migratory birds. Among these was one which I believe to be unknown to our naturalists. It is about the size of a quail, of an ash colour with black spots, and its eyes of a brilliant black, and surrounded with a bright sky-blue rim. Its legs have no feathers, but are covered with long rough hair; and its feet are not like those of any other bird, but resemble those of the green lizard, and are covered with a shell so hard as to resist the sharpest knife. This singular creature, which seems to partake at once of the character of the bird, the quadruped, and the reptile, is called by the Chinese Loung-Kio, that is Dragon's Foot. They generally arrive in great flocks from the north, especially when much snow has fallen, flying with astounding rapidity, so that the movement of their wings is like a shower of hail. When caught, they are extremely fierce; the hair on their legs bristles up if you approach them, and if you venture to caress them, you are sure to receive some violent blows from their beak." (P. Z. S. 1861.)

individuals, a moderate calculation. The underlying causes of this movement were much discussed, although few British naturalists are sufficiently acquainted with the physical conditions prevailing on the steppes of Mongolia, to approach that difficult problem with much likelihood of success. Australia has furnished evidence that in that continent some well-known species are liable to appear in swarms in certain regions, and after an interval again to disappear; while, even at home, some lessons are suggested by the remarkable increase of certain species, e.g. *Sturnus vulgaris* and *Columba œnas*; the last named having of recent years colonised the north-east of Scotland, though formerly almost unknown in the most northern counties of England as a breeding species. Over-population, as long since suggested by Professor Newton, correlated with a scarcity of food, may probably continue to be accepted as the prime factor in the migration of *Syrnhaptēs*; at the same time we cannot forget that the species is accustomed, in Asia, to traverse vast distances, for which contingency it is admirably adapted by the development of the pectoral muscles and the shape of the long wing feathers.

GENERAL HABITS OF PALLAS SAND GROUSE IN ENGLAND.

So little has hitherto been written to explain the idiosyncrasies of this Sand-grouse, *regarded as a British bird*, that the writer feels that no apology is needed for presenting as full a statement on this head, as his own too limited opportunities of outdoor study enable him to furnish at the present juncture of events.

Pallas Sand-grouse has proved, during the summer of 1888 in England, to be a highly gregarious bird; constantly affecting the company of its fellows. It is possible that it may entertain some aversion to the company of other species; at least it has not been observed by the writer to associate voluntarily with any other birds. In confinement, it has manifested some intolerance on this score. Thus, an example living at the Zoological Gardens (August) was observed to drive away a Woodlark (*Alauda arboreus*), and a second objected to the presence of a Pigeon placed in its enclosure to solace its supposed loneliness. In a state of nature, this Sand-grouse flies in parties of four or five birds, but more usually in

larger droves ; it manifestly seeks to live in a community, and if a flock be studied, their movements will be found to exhibit a high degree of unanimity.

Ignorance of the signification of hedgerows, easily comprehended as characterising a species accustomed to range at will over vast tracts of unenclosed country, proved fatal to some individuals on their first arrival, but the survivors were not slow to adopt habits of increased vigilance. Thus, when a flock of ten birds had been marked down into a ploughed field, and their propinquity obtained by a long *détour à ventre*, the writer had scarcely taken up a vantage point in a thick furze bush overlooking the birds, when they began to run together, and having packed on the ground, rose and abruptly departed, pausing only when they had gained the shelter of the sea beach. They were marked down afresh, but the like result followed. Rising sharply at forty yards distance, they executed a few rapid turns, and pitched in the field which they had quitted previously. On other occasions flocks, which had been shot at previously, showed similar wariness to that just described ; but at the same time it should be understood that when in full flight, parties of Sand-grouse will approach men within a few yards. Noticing a distant flock apparently making for the sea, a position in their probable line of flight was hastily secured, and with success, for the birds shot *overhead* across the heath like arrows, their wings beating the air audibly as they pursued their headlong course. On another occasion the writer happened to be walking beneath a bank of littoral sandhills, when a party of Sand-grouse dashed out over head, calling lustily. Away they sped across the beach, over long reaches of sand, away to the edge of a distant tide, and then following the water edge for about a mile, they swept westward towards Beckfoot, but checking their course before the village was reached, they rose high in the air and curving their course with one accord, travelled back to Wolstey, dropping once again in a favourite field. And at this point a word may be said about the flight of the Sand-grouse. Putting aside all preconceived notions, it must be held to bear a not inconsiderable similarity to that of the Golden Plover (*Charadrius pluvialis*) ; yet the flight of single

birds viewed at a distance served on more than one occasion to suggest some analogy with the flight of the Swift (*Cypselus apus*). To summarise their speed, it may be said that Sand-grouse fly on occasion like the wind. The flight of those that had chosen their feeding grounds was usually performed at a moderate elevation, often low; but occasionally mounting to three hundred feet, as nearly as the eye could form a trustworthy estimate.

Sand-grouse appear to manifest a homing faculty for certain spots, and though jealous of intrusion, may frequent a certain area for many days if shielded from harassing intrusion. Upon the ground most of their movements are characterised by extreme leisureliness, so long as undisturbed. They are partial of course to dusting in sand, and as though conscious of their protective colouration, remain for hours together in a favourite sand dune, enjoying warm sunshine.

Seen in confinement, Sand-grouse would appear to be a placid apathetic race.

During the summer of 1888 three examples were sent to the Zoological Society from Scotland. A visit paid to the Western Aviary on August 17th found the birds apparently reconciled to their environment. Their inactivity was marked, as they squatted together on the gravel, blinking their eyelids or lazily stretching a wing across a foot. This apathy was varied occasionally by their running to and fro and making a semblance of picking up seeds; nevertheless it continued so strongly marked as to recall some remarks of Professor Parker, which will bear quoting here: "These beautiful and gentle birds are seen at once to have in them something both of the Ptarmigan and the Pigeon; but there is in their physiognomy a marked inferiority of expression quite in contrast with the sharp intelligent look of the typical Fowls, and very much below what we see in the Pigeon-tribe. This is exactly in harmony with what the skeleton reveals; for while the characters of both these types are almost inextricably interwoven, yet there is in many points a marked inferiority of character." (P. Z. S. 1863, p. 257.)

The fact is that, Sand-grouse are seen to best advantage when performing their graceful aerial evolutions. Only on the breezy moor

or among the long lines of sand dunes can the "beatific vision" of a flock in full cry be enjoyed to perfection, at least in the north-west of England. The writer was first introduced to such an experience by Mr. R. Mann on May 28th; a visit to their haunts two months later was scarcely less pleasurable.

On August 3rd, Mr. Reynolds and the writer ferried across Drigg estuary, and after a few hundred yards of sand had been traversed, took up a position behind a long ridge of wind-drifted sand. A glance over the ridge revealed the existence of a strip of sandy ground, evidently saturated by recent rain; Sea Plantain and Glasswort were the only plants noticed. Conical sandhills rose and fell in the background, ridge flanking ridge until the sea beach was reached; in the near foreground, scattered over a small area, were resting the members of a flock of three and twenty Sand-grouse. A few were feeding; some were scattered in two and threes around; in the centre ten or eleven birds were squatting close to one another. In spite of all precautions, they seemed to suspect danger, and began to run together with shambling gait. A moment later found fifteen birds at once within the focus of the field glass. Up to this juncture no cry was heard, but when the birds rose in a pack their cry was distinctly audible, notwithstanding the deafening clamour over head of a large colony of Common Terns (*Sterna fluviatilis*).

MINOR HABITS.

(1.) THE CRY.—The principal cry of the species is a loud chuckle, and this appears to be modified in more ways than one. It should be stated however that the writer feels considerable diffidence in speaking of the cries of birds, not from inattention to a subject which has engaged his earnest attention for many years, but from the want of a trained musical ear. Prjevalsky renders the cry of this Sand-grouse, as uttered in flight by males, in the syllables "truck—turuk, truck—turuk," and this is certainly an accurate rendering of a not unmelodious call note. But if a flock of Sand-grouse be startled at close quarters, their first alarm note is harder and more guttural than their usual chorus, and jars

sharply on the ear. When at rest, the males modify the chuckle, to a sound which Mr. R. Mann and Mr. Tandy, hearing it at close quarters, compared to the call-note of the Partridge (*Perdrix cinerea*). On August 17th, a male bird at the Zoological Gardens, being studied carefully, was noticed to raise his head and cry as Mr. Mann had stated; a moment later he uttered the harsher chuckle, and two other Sand-grouse ran to him and squatted on the gravel beside him. It seems likely then, that the usual call-note is the chuckle described by the Russian explorer, modified into (1) a sexual call-note, or (2) an alarm note, according to circumstances.

It has been stated by Dr. Hans Gadow that, "from their voice we cannot gather much information as to their (Sand-grouse) affinities; but certainly *they do not coo*." (P. Z. S. 1882, p. 329.)

This hypothesis is now shaken by the discovery that Pallas Sand-grouse *does coo*.

Mr. R. Mann, having no knowledge that the question had ever been raised, wrote of a winged female (which he endeavoured with characteristic kindness, to keep alive for the writer): "We had it alive two days, when it died, having no doubt been hit in the body as well as the wing. When disturbed, it uttered a 'coo,' just like a pigeon will do." Desiring independent evidence on this point, reference was made to the possessor of a living bird, Mr. Macleod of Duntulm, Skye. This gentleman at once replied: "The Sand-grouse was winged on May 28th. The bird does 'coo' when frightened. When pleased, he gives utterance to sounds like 'cuck-cuck.' It is extremely fond of water. The only food it takes is oats." Thus, evidence is furnished by two independent observers, unknown to one another, that this Sand-grouse sometimes at least does *coo*. Perhaps Dr. Gadow will kindly reconsider his statement.

(2.) DRINKING.—The writer has traced the feet of Sand-grouse at their watering-places, and is disposed to believe that they drink in the forenoon and again about four p.m. On one occasion he observed a flock arrive in the neighbourhood of some pools, apparently to satisfy thirst, at the hour indicated, though this may

be found to vary seasonally. Certainly they repair daily to favourite pools and small streamlets.

(3.) NIDIFICATION.—Widespread disappointment has been experienced on this score, for grass meadows and sandhills as well as ploughed fields frequented by the birds have been explored with great labour and only negative results. Information reached the writer at the end of June, that a dealer professed to have received eggs of this Sand-grouse taken at Carlisle, but all particulars were withheld until August 21st, when Messrs. Stevens of King Street, offered for sale in lot 67 two eggs of *Pterodes alchata* (not a British species) labelled as eggs of *Syrrhaptes paradoxus* taken at Carlisle in June, 1888. A reference to these eggs, accepting their genuineness, was inserted in the "Zoologist" of September by the Editor, whose private note to the writer only reached him when the type was set up. On applying to the owner of the eggs in question for the name of the man who had taken these eggs "at Carlisle," he at once declared that he had been "duped" by his collector, and that there was "no truth in the story" that the eggs were authentic. This person had previously stated to a correspondent that he had found a brisk demand for Sand-grouse eggs, having sold twenty in two months. It may charitably be supposed that some at least of the number were eggs of Pallas Sand grouse, from abroad.

But consigning to limbo this painful disclosure, it must be stated that on first arrival, a few birds paired off and seemed disposed to nest. Two females shewed hatching spots, the one being killed by a dog on June 7th, and a second shot by a labourer on June 9th. More positive evidence is furnished by the fact that the writer sent to the "Field" Office the ovaries of two females (killed on May 26th and May 28th), asking that a professed expert might give an official opinion as to whether they would have naturally nested. The Editor of that Journal replied that "both the hens would have nested, the one in the course of a few days, the other in less than a fortnight." It may be stated that no precautions were spared to secure the safety of nests, had such been discovered.

(4.) FOOD.—Pallas Sand-grouse appears to consume almost every variety of seed obtainable, judging from the experience of

brother ornithologists. But in the north-west of England it has shewn a strong partiality for the seeds of clover, turnip, and rye-grass, as also for the seeds of Glasswort. The gizzards usually contain some fine pieces of quartz or grit.

(5.) TERRESTRIAL PROGRESSION.—The remarkable foot, which induced Illiger to propose the genus of *Syrrhaptēs* for *Tetrao paradoxus*, Pall.,—is doubtless well adapted to a sandy country. Mr. Reynolds wrote under date August 3rd: "The footprints are curious. They are very small for a bird seemingly larger than a Partridge. The middle claw extends far beyond the other two, and the smallness of foot may account for a kind of roll or shuffle they have in walking or running." On August 6th, hundreds of the impressions in wet sand were examined, in which no variation could be detected. The pad always seems to produce a depression, shallowest in front; where the three claws pierce the sand, and leave three round holes, the first in front of the other two. Although the legs of the Sand-grouse are so short, and their feet encased in pads, they *can* run with considerable celerity if alarmed. A bird at the Zoological Gardens offered a close examination of the shambling gait of the genus. He ran to and fro, but never hopped; he always put out one foot, and then the other, using each alternately.

(6.) MOULT.—On August 6th it was found that the Ravenglass birds were moulting hard. The ground they frequented was strewn with their cast feathers. Their "mutes" also abounded, and these when fresh are in colour lead-grey, varying above to a chalky white, and drying a yellowish brown. On August 17th, the birds at Regent's Park were deep in moult. Evidently the species performs the moult in August.

ARRIVAL OF PALLAS SAND-GROUSE.

I. CUMBERLAND.—(a) *East Cumberland*. No birds have been reported from Penrith, Alston, or Renwick districts, though all enquiries were made by Messrs. Tandy, Walton, and Lawrence. It would appear that none have on this occasion appeared in those districts. But Mr. J. J. Baillie of Carlisle has informed the writer of Sand-grouse seen in Northumberland, about thirteen miles east

of Alston. Had these continued their course westward, no doubt they would have crossed Cumberland. As it is, only the north-eastern corner of the county is known to have been favoured. Near Stapleton, "a lot of five, and on the same day another lot of three," were seen by Mr. H. J. Lorraine, of Westfield House. At Winter-shields, near Bewcastle, a flock of "about twenty" came under the notice of Mr. Richardson, while frequenting a small moss for two or three days. Neither of these gentlemen have been able to furnish an exact date, and both assigned the occurrence to April. Near Longtown, two flights of about a dozen birds were observed by Robert Moscrop, gamekeeper to Major Irwin, flying very rapidly towards the west. "At first I thought," he writes, "they were Golden Plover, as they much resembled their flight, but they were larger, and darker in plumage, and uttered a peculiar 'chuck-cho-chuck' as they flew along well up in the air." Mr. Moscrop was at first under the impression, like the gentlemen just mentioned, that he had seen the birds in April; but a reference to his diary proves indisputably that the correct date on which he observed the second drove was May 21st, and he accounts for his first impression by the coldness of the season. No more birds were seen (or at least reported) from East Cumberland until August 10th, when a flock crossed the Esk at Birrell's weir, near Floriston, in view of Major Hogg and Mr. Routledge, who were fishing at the time. Major Hogg has kindly furnished the following statement. "I should say that I saw about thirty-five birds, not more. I saw them twice, but they were the same flock evidently. They appeared to me darker in plumage than the bird we find in such numbers in India, where it is called by the natives 'Guttoo,' from the continued call it makes when flying."

(b) *Cumbrian Plain.* A flock of six or seven appeared in some fields near Orton, on the northern edge of the Cumbrian plain, on May 19th, as reported by Mr. Davidson, and continued to frequent that locality until May 26th, when three were shot and brought in the flesh to George Dawson of Carlisle. About this time a flock of nine took up their abode on the mosses and grass fields near Bow. Mr. J. C. Robinson and Mr. Dawson, being well acquainted

with the farmers of the district, succeeded in rousing much interest in the preservation of the birds, and none being shot, the party haunted that district the entire summer.

(c) *The English Solway.* Much interest attaches to the immigration of Sand-grouse to this district, from which their presence was first reported by that excellent out-door naturalist, Mr. Richard Mann. First seen here were a pair of birds seen by Mr. Williamson, jun., near Allonby, on May 22nd. It is probable, from information obtained by Mr. Tom Duckworth and others, that about this date Sand-grouse appeared near Bowness and Abbey. But the earliest date of any number is May 27th. On the morning of that day a flock were seen near Silloth by Mr. Osborn. The same afternoon a flock of fifteen were seen at close quarters under cover of a hedgerow, by Mr. R. Mann, near Allonby. The writer reached the ground on the following forenoon, and with Mr. R. Mann as guide, observed a number of birds. They had however been shot at, and were growing wild. A flock of fifteen which were tame and had not previously been shot at, was seen in the locality the same day. On June 5th, a flock of thirty birds flew past William Nicol, while shrimping near Silloth pier; and the same flock lingered in the neighbourhood until the 8th, when it was last seen, flying west. On June 9th, Mr. Tandy discovered that a party of ten birds had frequented Wolstey farm since the beginning of the month, and there they remained until the 13th, when one report affirms that they were seen to cross the Solway firth to the Scotch side.

Since June 13th, very few birds have been seen near the English Solway. On June 25th, a single bird was seen by W. Nicol to cross the Solway from the Scotch side, proceeding inland when it reached our coast. On the 28th June, ten or twelve birds visited the Grune Point. On the 20th of July a flock of eight or nine birds crossed over to us from the Scottish side of the Solway.

(d) *West Cumberland.* (1) Near Cockermouth, the Rev. A. Sutton, whose experience of Sand-grouse in the Soudan is extensive, observed three birds on the Tallantine Hill, July 2-3. When disturbed, they flew to Millstone Moss.

(2) At Sandwith, as reported by Mr. H. Nott, four Sand-grouse were seen on the high ground above St. Bees during the second week of July, by a young farmer, "whose dog turned them out of the turnips."

(3) At Seascale, following the coast line south, a male and female were shot by Mr. John Porter on June 5th, out of a flock of nine. Both birds were killed at one shot, and the seven survivors departed in a southerly direction, information being kindly supplied by Dr. Parker of Gosforth, and Mr. Porter.

(4) At Ravenglass, a flock of twenty-three settled among the sandhills protected by Lord Muncaster, the lord of the manor, on July 24th, as ascertained by Joseph Farren, who watched over their interests for many days.

This at present concludes the report so far as concerns Cumberland.

II. LANCASHIRE.—*Furness*. This district belongs to the diocese of Carlisle, and Mr. F. S. Mitchell, the historian of the Birds of Lancashire, informed the writer that he considered it belonged to the faunal area of the Lake District, rather than to his own dependency. It is therefore included in this report without further apology.

Walney Island. It will be remembered that in 1863 a flock of eight Sand-grouse visited the sandhills of Walney, and two were shot. These specimens are still preserved on the island. (Durnford, Zool. 1877, p. 277.) On the present occasion Mr. W. Duckworth visited Walney on June 4th and subsequently. He ascertained on that date the presence of a flock of fourteen, and another of seven, the first birds having arrived on May 19th. Between that date and June 18th, seven were shot and sent to a taxidermist at Barrow. On June 11th a flock of forty, and another of seventeen, appeared at the north end of Walney; and on June 17th a flock of eight were seen at the south end of the island.

III. WESTMORLAND.—Local enquiries have hitherto failed to produce certain evidence of the presence of Sand-grouse in that part of our faunal area. But as Mr. W. Duckworth fell in with a

flock on Greenodd Sands in June, it is most probable that some birds visited fields in the vicinity of the Kent estuary.

Having thus dealt with our own faunal area, it may be convenient to quote data for two quarters to which Sand-grouse *probably travelled through Cumberland*.

ISLE OF MAN.—A flock of eight birds arrived in the island on May 22nd; and on the 28th one was shot out of a flock of fifteen. (P. M. C. Kermode, Zool. 1888, p. 265). Early in June a flock of about fifty visited the island. (T. H. Nelson, *ib.* p. 300). A third record must be passed over as anonymous.

SCOTTISH SOLWAY.—None were seen until June 7th, though the first news of the arrival of the birds in Cumberland had been telegraphed to Mr. R. Service, and he had instructed local observers to expect them. Mr. Service's report will of course appear in the general report for Scotland, and it is only necessary to say that at one time sixty birds visited him, of which number nine alone remained on August 17th, the remainder having been "squandered," as we say in Cumberland.

FIRST ARRIVAL.

At Dunbar, N.B., Sand-grouse first arrived on May 16th, as reported by Mr. W. Evans, whose kind thoughtfulness enabled the writer to send out early warnings to all his local observers.

In Cumberland, birds were first seen at Thursby, on May 19th; on Walney island, on the same day; at the Isle of Man on May 22nd; on the Scottish Solway on June 7th. The bulk of those that visited us appear to have arrived between May 19th and the beginning of June.

The earliest dates quoted by Mr. J. E. Harting are:—Hants, May 15th; Aberdeenshire, May 17th; Yorkshire, Oxfordshire, Herts, all May 18th. (Zool. 1888, p. 234.) To Mr. Cordeaux we are indebted for information from Mr. H. Gätke's delightful bird observatory on Heligoland, and the following are a few of the dates furnished thence:—May 8th, twelve birds; 13th, a score; 14th, some; 18th, flights of from twenty to two hundred head;

19th, a few; 22nd, many hundreds; 24th, many great flights 25th, many flights. (Zool. ib., p. 267.) But the record should be read of course *in extenso*. It is only here quoted, because it bears out the writer's belief that the "rush" reached English shores during the last week in May, and that birds, seen in the north-west of England before the 22nd, were only the pioneers of the hordes that were to follow immediately after.

CENSUS OF NUMBERS.

This is difficult to estimate with accuracy. Certainly *the same flocks have been seen many times by different observers*. Assuming that the birds seen in East Cumberland were afterwards observed on the Solway, and that the Allonby birds returned to Wolstey, we should be forced to admit that at least forty birds visited Allonby, and thirty others frequented Skinburness, giving at least a total of seventy birds. Granting that the Thursby and Orton birds belonged to the same flock, we have to admit the presence of at least twelve birds. The contingent of twenty-three at Ravenglass may have gathered up the Seascale birds, and those of Sandwith; on this assumption we should have to account for twenty-five birds. Thus, a severe estimate would assure us that one hundred and seven birds visited Cumberland, and this excludes the birds which crossed to us from Scotland, on the consideration that they had probably crossed previously to Scotland from the English Solway. It may therefore be said with certainty that the number that visited Cumberland between May and August slightly exceeded one hundred birds, on a very low estimate. It is not unlikely that the Ravenglass birds had previously visited Walney, where Mr. Duckworth's numbers amounted to fifty-seven on June 11th.

MORTALITY OF SAND-GROUSE.

At Thursby, three were shot. At Silloth, four were shot, and another (perhaps a sitting bird,) killed by a dog. At Seascale, two were shot. At Allonby, twelve were shot or winged, giving a (corrected) total of twenty-two killed in Cumberland prior to June 10th, since which date none are known to have been killed.

MIGRATION.

The foregoing evidence suggests that the more northern division of Sand-grouse, visiting Cumberland, arrived on the east coast between Berwick and Holy Island, striking across the Bewcastle fells and proceeding westward to the Solway (and probably the Isle of Man,) viâ Floriston and Thursby.

The southern division perhaps arrived at Spurn, and after following the Humber, crossed north-west Lancashire, pausing at Walney before travelling along the Cumbrian shores, or crossing the sea to the Isle of Man. There appears to be a recognised line of flight adopted by some birds, between Drigg point and the Isle of Man. It is more difficult to account for the shifting of the Sand-grouse from one place to another. In some instances the birds appear to have resented intrusion. At Silloth, for instance, ladies with parasols were observed by the writer to frequent the sandhills and beach favoured by the birds, and to cause them much needless inconvenience. The supply of food has also regulated their wanderings, since with us they have fed chiefly on the seed of clover, turnip, and rye, which can not be obtained everywhere. But their vagaries have proved them to be true Bedouins, inheriting a wandering disposition from their progenitors, whose prolonged sojourn in sterile regions has clearly induced them to transmit to their descendants a roving character. Nor should it be forgotten that these strangers landed on British shores whilst suffering from migratory fever, under the excitement of which their enormous journies appear to have been executed with comparatively small losses. There is no reason to doubt that they will gradually become habituated to their new environment, if a few years of rest are accorded to them in this country.

ACCLIMATISATION OF PALLAS SAND-GROUSE.

During the summer of 1888, the birds have frequented mosses, grasslands, and, when possible, ranges of sandhills, feeding chiefly on arable fields in the occupation of farmers. They have shewn that they can subsist on a variety of seeds, and some of these are injurious to the agricultural interests. That they will eat insects

is also ascertained. On this score little anxiety will probably be felt by the public. As regards their natural enemies, they are most likely to suffer from foxes, stoats, and marauding cats, while roosting together on some flat ground, screened from the wind if possible, as their habit seems to be. In their native country, their only enemy is *Falco hendersoni*, a near ally of the well-known Sacer Falcon. But, though this fine hawk usually strikes at Sand-grouse when drinking, and, therefore, more than usually exposed to danger, Prjevalsky is careful to tell us that even "he can not always catch them, as they are very quick." No doubt a Peregrine would find an old Sand-grouse a worthy quarry, but Peregrines are now scarce in most parts of Britain.

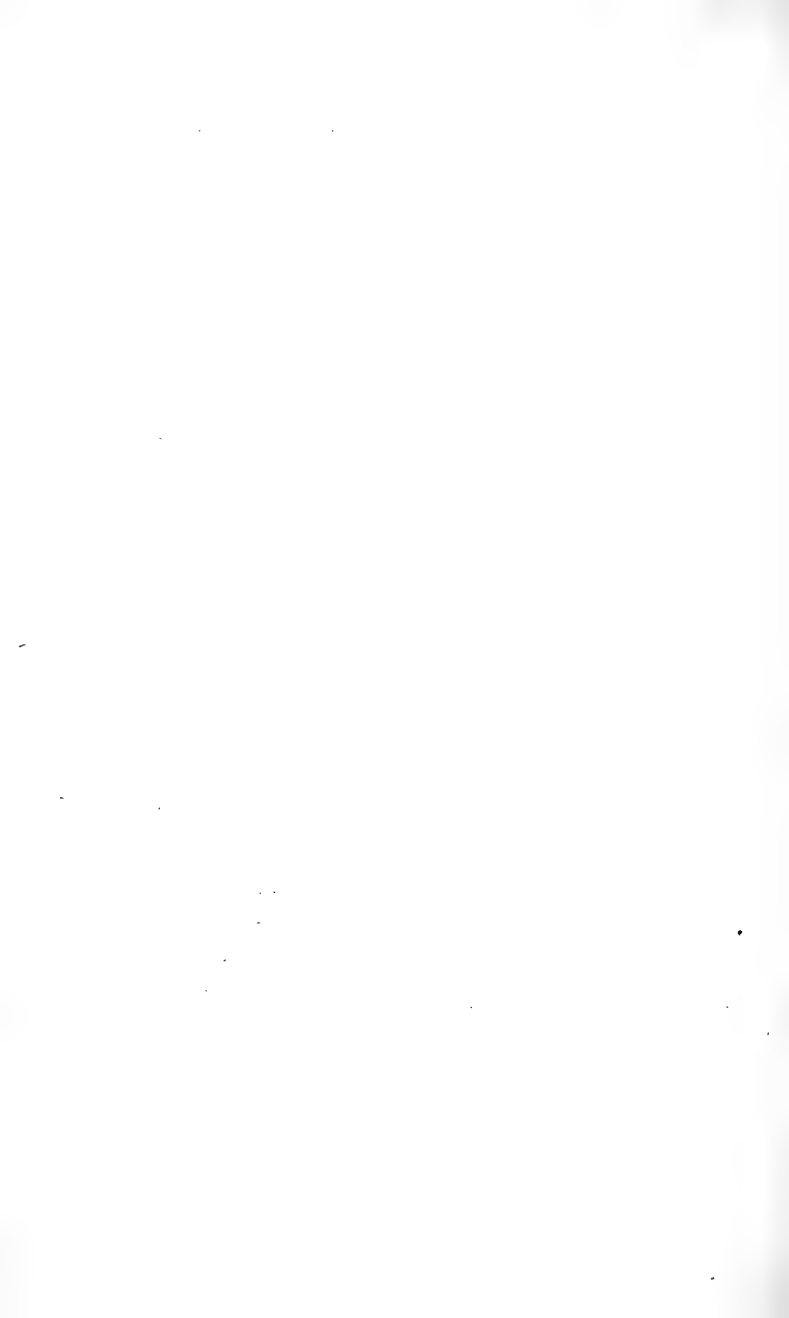
Anglo-Indians have repeatedly assured the writer that Sand-grouse offer excellent sport and are good eating, and Mr. J. H. Gurney, junr., has already recorded his opinion that a well-dressed Pallas Sand-grouse is a toothsome viand.

But, the writer has been cautioned against encouraging an over sanguine temperament, because his expectations of Sand-grouse nesting in Cumberland for the moment remain unaccomplished. It has already been shewn that powder and shot are partly to blame for that. But consider the rainfall of the summer of 1888. At Carlisle, the rainfall in May was 1'20; June, 1'82; in July, the record rose to 5'66; and on the 28th of July, as much as 1'12 fell. In 1887, the local rainfall for June was 0'30; in July, 2'30.

Nor should it be forgotten that the birds reached England in the middle of their breeding season. Though the writer only handled a dozen birds in the flesh, he has more than a suspicion that females and immature males predominated. But, it is argued with a show of plausibility, Sand-grouse are natives of hot countries, and could never endure the vicissitudes of English winters. This is based on the supposition that, because most Sand-grouse inhabit warm countries, Pallas Sand-grouse must be delicate. Doubtless our climate would deal harshly with any of the twelve species of *Pterodidae* which Elliot refers to the Ethiopian region, and the remark of course applies to such species as belong to the Oriental region.

But Pallas Sand-grouse is a hardy Asiatic, accustomed to winter in North China, where the winters are well known to be very severe. The evidence of Swinhoe has often been quoted. But glance at that of the Hon. J. F. Stuart Wortley, who gave the following account of the species, *apropos* of thirty-four living birds which he had purchased for the gardens of the Zoological Society, in the public market at Tientsin. The wild birds "were always to be seen in large packs such as you see grouse in, when they get wild in September, and seemed to like being by the side of the river on the mud banks when left dry by the tide. The temperature at the time the birds first began to be seen, was about 20° fahr., and later on considerably lower; and on the day we finally steamed down through the ice, which covered the Peiho for about fifty miles of its course, the temperature was as low as 10° fahr., and the Grouse were in large flocks on each side." (P.Z.S., 1861, pp. 196-8). This statement, if viewed calmly and dispassionately, may be taken to disprove the likelihood of the alarmist theory that *this* Sand-grouse is too delicate to endure our English winters. Of the movements to our estuaries, which, under certain conditions, might take place; or of the additions to the numbers of Sand-grouse in this country, which may not improbably occur, should the birds that visited Norway during the late great movements be induced by stress of weather to continue their suspended exertions, and cross the German ocean in a south-westerly direction, it would at present be premature to speak.

It only remains that the writer should tender cordial thanks to his correspondents, whose timely responses to various enquiries have materially benefitted the accompanying report. Of friends at a distance, Mr. Edward Bidwell and Mr. A. C. Chapman interested themselves on his behalf. He has also had the advantage of consulting Professor Newton.



PRESIDENTIAL ADDRESS.

By R. A. ALLISON, Esq., M.P.

(Delivered at Longtown, 1888.)

You have now I believe reached the most northern limit of the realm over which your Association for the Advancement of Literature and Science holds sway. Longtown is, I take it, the Ultima Thule of your dominions, and I can assure you I have great pleasure in being the mouthpiece through which the words of welcome that are usual on these occasions are addressed to you by your most northern, but not, I am sure I may say, your least loyal and devoted subjects. No doubt, in comparison with the places you have already visited at these annual meetings—places such as Carlisle, Cockermouth, Keswick, and many others—Longtown may seem to be lacking in importance and interest, just as I fear you have found it somewhat difficult and inconvenient to reach. Still, although those larger places may open to you fields of observation with which here we cannot vie, and supply you with audiences whose numbers we cannot reach, we may claim that this little town standing, as it does, on the very threshold of the interesting Border district, has its claims on your appreciative notice, and that the neighbourhood of which it is the centre, is, from many points of view, one of not the least interesting and characteristic of those with which you have to deal.

Let me say too, in passing, that one of its claims to your favourable consideration is that it was one of the earliest branches to join your central Association. I think it did so in the third year of

your existence, and that though in numbers it has always been one of your smallest societies, it has nevertheless been one of the most constant and loyal, and that nowhere have the lecturers you have been good enough to supply met with more appreciative listeners. It is, indeed, just one of the places that, from being small, is most advantaged by contact with such a larger Association as yours. In many places in these modern days there is such a congestion of meetings, whether for amusement, business, or instruction, that tired and harassed human nature seems to revolt at any addition to its load, and to long to be left at peace, and, like the river, to wander in the paths of literature and science at its own sweet will. We have not quite reached that condition here. They still have some time to digest and ponder upon the lectures you are able to supply. They still have some of that leisure which elsewhere has too often taken flight to return to us no more; and I believe I am only speaking what is sincerely felt by the members of the Longtown branch, when I say how indebted they are for the valuable assistance which on many occasions you have given them, and which they look forward to receiving from you in the future. They could not, of course, in a small place like this, expect to obtain such lecturers as you are able to obtain for them, and they are therefore proportionately grateful for the services you render.

It is perhaps not quite the locality in which, even in times comparatively modern, lecturers would have found themselves at home. The people who lived here have not always been distinguished for their devout attachment to law and order. I suppose, indeed, there are few places in which we may say that even in recent days, at any rate, within a century and a half, a more complete change has been brought about, as well in the characters of the people who live here, as in the natural features of the locality in which they dwell. It was thus described by the learned Dr. Stukely, when he visited it in the course of his travels in the north in the beginning of the last century. "From hence," and if I remember right he was coming from a visit to the castle at Scaleby, "over a dismal boggy moor—an uncultivated desert—we travelled to Netherby. They told us that for sixty miles

further northward there is scarce a house or tree to be seen all the way—the valley by the river side is very good land with some shadow of nature's beautiful face left, but everywhere else about us is the most melancholy dreary view I ever beheld, and as the backdoor of creation: here and there a castellated house by the river, whither at night the cattle are driven for security from the borderers: as for the houses of the cottagers they are mean beyond imagination, made of mud and thatched with turf, without windows, only one story, the people almost naked. We returned through Longtown, whose streets are entirely composed of such structures."

Well, wherever you may have arrived to-day, I hope you will not feel inclined to say that you have reached "the backdoor of creation," and that you will be more complimentary to us in the name of Literature and Science than Dr. Stukely was. The learned doctor would have been somewhat astonished had he been asked to lecture.

Longtown, if it has had the distinction, has also had the disadvantages which, perhaps, are more easily discerned, of being a frontier or outpost town. It is uncomfortably described by one of the old chroniclers as a certain region lying between England and Scotland. It does not need a very lively imagination to picture what that meant at certain periods of our history. For years it was claimed by both countries, and the prey of either in its turn. It was for centuries the scene of continuous fights and forays, which we all feel, in spite of the glamour of romance that is flung around them in the old Border ballads, or in the magic pages of Sir Walter Scott, must have inflicted terrible sorrow and suffering on all engaged in them. It was an outpost when first we hear of it in history in the days of the Roman occupation, when first we find ourselves on the firm ground of recorded facts. There is no doubt that at Netherby there was a station of very considerable size and importance. It was possibly one of those selected by Agricola himself when in the course of his British campaigns about the year 80 A.D., having subdued those tribes of the Brigantes who dwelt in the modern counties of Lancashire and Yorkshire, he advanced by two routes, an eastern and a western, against the more northern

inhabitants of the kingdom. With his eastern route we are not concerned. His western road in all probability was from Carlisle through the territory of the Selgovæ who occupied Dumfriesshire, and whose name is supposed to linger among us in that of the Solway Firth.

The first station from Carlisle was at Netherby, and here perhaps, without any very great improbability, we may imagine, if we choose, with the Antiquary in Sir Walter Scott's famous novel, Agricola himself to have been, and "from this place," as he said, "we may suppose him to have looked forth." You remember, I dare say, how—a warning and a caution to all future antiquarians—Sir Walter depicts the old gentleman waxing eloquent over a stone on which were engraved the magic letters A. D. L. L., which he interpreted to be "Agricola dicavit libens lubens," and how on this foundation he raised a vast superstructure of Roman camps and campaigns, which he illustrated with great research and learning to his young companion. He had just fixed on the precise position of the prætorium, when he was rudely interrupted by the remark of the old beggar, destructive as the ponderous folio of the acutest critic, "Prætorian here—Prætorian there; I mind the bigging of it;" who further proceeded to dash to pieces his ingenious rendering of the inscription by declaring it to be within his own knowledge that it stood for Aiken Drum's Lang Ladle. The anecdote may warn us to leave the subject of Agricola. But whether he was here or not, so far as a Roman station is concerned we stand on surer ground; and if we have no inscription that bears the name of Agricola himself, we have preserved for us a long series of inscriptions which conclusively prove that from his days onward throughout the whole period that they remained, the station here was occupied by troops; and that among those troops were some of the most distinguished legions that fought in Britain—the 2nd, the 6th, the 20th legion; the 1st cohort of the Spaniards; the cohors Nervana, which bore the name of the Emperor Nerva—all these were here, and all have left the traces of their presence. We have the monumental stone of a Rhætian lady—belonging to a people who lived in the modern district of the Tyrol—and who

died here probably on her way to join some of her own compatriots who were stationed a little further north at Middleby—the first recorded of the many strangers who at one time or another have passed through this little town. The inscription does not name her death—the Roman tombstones never did—it simply says she lived thirty-five years eight months and fifteen days.

When at the beginning of the second century the Emperor Hadrian visited this district, and drew the line of stations that were to form the famous wall to be here the boundary of his empire, Netherby was left as an outpost to the north ; and so, it may be, deserved the name with which it is usually identified—viz., that of *Castra Exploratorum*—the Camp of the Explorers. It is given in the 2nd *Iter*. of Antoninus in the list of Stations on the great road that extended from Richborough in Kent to Middleby, and is named as twelve miles north of Carlisle—the Roman mile being somewhat shorter than our own. The name, however, is not found at a later date in the Roman Army list which we possess, and which, according to Dr. Bruce, was drawn up a few years before they finally left the country. It may be that this outpost had been already found untenable, and had been surrendered to the native tribes. But here for a long period the Roman troops remained ; and we cannot doubt that their presence exercised some permanent influence on the district.

It was the practice of the Romans to use the inhabitants of one conquered country in the subjugation of another ; and while here, we know there were gathered the representatives of various nationalities, the natives, no doubt, from here would be drafted away to assist in that great task which fired the genius of Virgil when he wrote :—

Be thine, O Rome, the glorious work the folks of earth to sway,
For this shall be thy handicraft, peace on the world to lay.

Well, it is not pleasant to speak of a period when we were a conquered country ; but I should not wonder if it was long before this district knew more settled days than those it spent under Roman rule ; and there must have been a certain amount of life and interest, especially to the British ladies, in having amongst us

the very best troops—the Guards, as it were—of the world's great conquerors. But at last, as we know, towards the middle of the fifth century, they left us altogether. The British tribes, more or less Romanized, as the case may be, were left to protect themselves as best they could against their other foes—Picts and Scots and Angles, as the case might be.

It is in the course of their struggles against the latter in the century following the departure of the Romans, that an interesting problem presents itself to us for solution in this locality—a problem which, if we could only solve in favour of the locality, connects us here with another famous name. We all know how large a part of the sentiment and imaginings of mediæval romance and poetry is centred on the story of King Arthur and his table round; how, instead of being, as he was once supposed to be, a mere mythical hero, suited to adorn the nursery rhyme with which we used to be familiar, or the poetic stories that have delighted our maturer days, modern authorities have decided in favour of his real existence as a great leader of the native Britons in their sturdy endeavour to maintain their independence against the foes who pressed upon them. It is agreed then that Arthur was a real leader of the people—the dispute is as to the locality which was the scene of his operations—and there being on this head a conflict of opinion among equally high authorities, I think we who live here are fully justified in claiming him for our own, and giving our vote with those who hold him to have been the great chief of the northern Cymri of Strathclyde and Cumberland, and the great assertor of their liberties. It may be that the name *Arthuret* itself is connected with his presence in our midst; but, however this may be, there seems, at any rate, fair grounds for the assumption that this district was the scene of the exploits of one whose great achievements and personal qualities so impressed themselves upon his contemporaries that he was handed down to posterity as the very model of a christian knight—a true leader of the people.

It was here too a little later that is said to have been fought the great battle of *Arderydd*—a battle waged between the Christian and the pagan Cymri—between those who had come under the influence

of the teaching of Columba and his monks, and those who still adhered to the old Druidic and native worship. Rydderch Hael was the leader of the former, Gwendolen of the latter, whose name is said to be preserved for us in Carwinley—Caer-Gwendolen—the fort or strong place of Gwendolen. The battle was won by the Christian party, and led to the return of Kentigern, the great missionary Bishop of the Border, whose activity and success is attested by the many churches which are dedicated to his name. Your own is not one of them, though the antiquity of its foundation is proved by its dedication to St. Michael, who was a favourite saint with the early British churches in the seventh and eighth centuries. The advowson of Arthuret was given at a later date by Turgis de Russdale, who was lord of the barony of Lyddale in the twelfth century, and had his seat at the mote of Lyddale, of which Chancellor Ferguson gave so excellent an account on a recent occasion—and which is one of the most interesting of your ancient monuments—to the Abbot and Convent of Jedworth, with which it may have previously been connected. We have an account in the reign of Edward III. of an inquisition that was held at Carlisle in 1328, in which the Abbot lays claim to the advowson which Edward II. had taken from him. The claim was allowed, the inquisition finding that they had held it for time beyond memory; but a few years later it was again forfeited, and the connection finally dissolved, on the ground that the Abbot had become a Scotch enemy and rebel.

The Barony of Lyddale passed, towards the close of the 12th century, to the De Stutevilles, a family of great repute and influence upon the Borders, one of whom, William, married a niece of Ranulf de Glanville, the famous statesman of Henry II.'s reign, and was High Sheriff of the County during the early years of King John, from 1199 to 1204. The Pipe Rolls, or annual accounts, are full of the irksome incidents which, in their and other cases, formed the tenure under which they held their possessions from the Crown—a very different thing from the fee simple of which we boast in modern days. Thus, in the third year of King John, Nicholas de Stuteville pays £5 *ne* transfretet—to avoid military service abroad.

In the following year, Helewisa de Stuteville pays 60 marks to avoid being compelled to marry within the stipulated year and a day which was prescribed for widows in her position. The last of the family was Joanna, who died in 1276. We have a full account of the property which she held, as disclosed at the enquiry that took place upon her death at Carlisle. She held, we are told, the barony from the king in capite—"in chief." Among other places named as belonging to it are Arthureth, Stubhille, Randolph Levington (Randalinton), Bracanhille, Katkledy (Catlowdy), Standgarthsyde, Bayth, Nether-bayth, and Haytwayt. There was then, it seems, a church at Eston, the advowson of which was worth 10 marks. Among her possessions are noted a bakery, three breweries, a fulling mill, and four water mills. Joanna had married Hugh de Wake, and her son Sir Baldewyn de Wake, who is declared at the enquiry to be of full age and more, succeeded her. He died 1281, and in the description of the manor given at his death, it is said that "there is at Lydel the site of a castle containing these domiciles, viz.: a wooden hall, with 2 solars* and cellars, a chapel, a kitchen, a byre, a grange, and a wooden granary, which threaten, but might now be repaired for 5 marks." "There is also," it goes on, "a forest called Nichole† forest, 7 leagues in length, whereof 4 are of 3 leagues breadth, and the remaining 3 of 1 league breadth by estimate. . . . There may be sold in the forest, of dead wood yearly, without destruction or waste, 100 shillings. . . . And they of the forest must preserve the nests of sparrow hawks and eagles." The value of the whole manor is returned at £295 16s. 2d. In 1294, John Wake, his successor, is allowed to lease his manor for seven years. In 1300 he died. Among his possessions are recorded 6½ salt oxen, each 8s.; a cask wine, 66s. 8d.; an iron mounted cart and harness, 6s. 8d.; and 2 wagons, 12d. By an order of the King, Edward I., made at La Rose, Sir Simon de Lyndeseye, of Arthuret, was appointed keeper of his lands and of the mote of Lydel, through the nonage of Sir John's son and heir, the tower of Joanna his wife being reserved. At a later period

* Solar was a loft.

† Perhaps called after Nicholas de Stuteville.

Sir John de Seagrave was named by Edward II. to succeed Sir Simon, being allowed to retain out of the first issues of the manor, the sum of £513 18s. 8d., due to him for services rendered to the king as warden of Scotland. By 1319, Sir Thomas, the son, had come of age, and though not present in person, sent sixty-five soldiers to assist the king's army at the Siege of Berwick. This Thomas married Blanche, daughter of Henry Plantagenet, Earl of Lancaster, and in 1324 he is styled the king's cousin, and is named as going in his service to Aquitaine, with thirty men-at-arms. At a later period, his loyalty to the king fell under suspicion, and his lands were seized, but restored upon his exonerating himself. Under Edward III. he was named, in 1340, along with Anthony de Lucy and Peter Tylliol, as commissioner to put down the evil doers who infest the woods and passes, and slay the king's lieges both Scots and English. A year later (perhaps he was getting old and preparing for his latter end,) a safe conduct is granted to him to go on a pilgrimage to Saint Jake, Saint James at Melrose. Eight years, however, of life remained to him, for he did not die till 1349, on the vigil of Pentecost. The value of the manor is now returned at only £70 16s. 2d., or less than one-fourth of what it was in 1276—so troublous the period that had been passed through. His wife Blanche survived him, and their son dying without issue, the next heir was his sister Margaret, married to Edward Plantagenet, Earl of Kent, third son of King Edward I. In the end the barony reverted to King Edward III., through failure of male issue, and remained in the Crown till 1604, when it was given by James I. to the Earls of Cumberland, who sold it in the reign of Charles I. to Richard Graham, who, following the fortunes of the king, was nearly killed at Edgehill.

These centuries that followed the Norman conquest were centuries no doubt of trial for all who had the misfortune to inhabit this district. The constant incursions of the Scotch, and the reprisals to which they too naturally led, must have made residence here anything but an enviable position. It would be needless to pursue the details of these ever recurring Scottish raids. It is enough to say that they were incessant. John Halton, Bishop of Carlisle, in 1304, speaks

of their "daily aggressions." The chronicle of Lanercost says they came "more solito, in their usual fashion." In 1317, William de Dacre reports that the country is so utterly wasted and burned, that from Lochmaben to Carlisle there is neither man or beast left. Can we wonder at the result that followed—that the people who lived here became the despair of the Wardens of the Marches—and that the district was at length described "as the sink and receptacle of proscribed wretches, who acknowledged neither kingdom, obeyed the laws of neither country, and feared no punishment." No wonder that Lord William Howard, the Belted Will of Border history, looking upon the condition of affairs on his arrival in these parts, as he puts it in a letter of 1606, with the eye of "a southern novice," was astonished at what he saw, and endeavoured to do something to restore at least a semblance of order and civilisation. The Grahams, of innumerable places, are always singled out as being the chief offenders. "If the Grahams were not," says Sir W. Lawson, in 1605, "these parts would be as free from blood and theft as Yorkshire." Unwearying and continuous were the efforts that were made. A trial was made of exportation, and the leading offenders were sent abroad. "Change of air," it was said, "will make in them an exchange of manners." But again and again, we are told, they returned; and other and more natural methods were employed that have proved more efficacious in the end.

The record of progress here has been a slow one, but it has been a sure one; and our house has at length been set in order to receive an Association for the Advancement of the twin sisters of Literature and Science. It is a result that fills one with hope in dealing with similar difficulties that have to be faced elsewhere. I think it was Napoleon who said there were only two powers—the power of the sabre and the power of the mind; and he added that in the end the power of the sabre must yield to the power of the mind. That has been the issue here; and the progress that has been made will, we hope, be maintained. We hope that the connection of Longtown with this Association will continue to your mutual profit, and that in these days of education, increasing numbers of

the young people will avail themselves of the advantages you offer with your meetings in the winter, and your still more pleasant rambles in the summer, when we have one. No one of course supposes that lectures such as are delivered to your members are the highest or most important form of education. Nothing that anybody can tell you will ever be so useful as what you learn for yourselves. - Of all short cuts, short cuts to knowledge are the most delusive. There is room, I dare say, for the warning that Mr. Ruskin once gave when he was asked to lecture somewhere. "Everybody wants to hear—nobody to read—nobody to think : to be excited for an hour, if possible amused : to have knowledge first sweetened up to make it palatable, and then kneaded into the smallest possible pills—and then to swallow them homœopathically and to be wise." Well, we shall all agree with Mr. Ruskin that the thing cannot be done. He has expressed in forcible language what we all feel. But it is hoped—and I believe in practice it has been found to be the result of the work of this and similar Associations—that they may in some measure lead people to read and think for themselves, by suggesting to them fresh subjects to read and think upon, and by bringing them into contact with other minds on those that have interested them before,

Literature and Science—the two branches of study with which you undertake to deal—cover a vast field, over which you may range at will. Each will commend itself to different minds. Physical Science—the history of the world in which we dwell—of those laws of nature by which it has been brought to its present condition through countless ages, and which still we see at work before our eyes—the marvellous adaptation of cause and effect in the natural world around us—these are objects of the deepest interest to every thinking man. And besides their interest in the investigation of them, a precision is given to the thought, and an accuracy to the mind, which is of the utmost value in every occupation of our lives. But not less interesting certainly is the other subject with which you have to deal—the history of man himself—the history of the progress by which he has attained to the state we find him in to-day, and of the great works and deeds which have been the steps of that

progress, and by which the great men of the ages that are past being dead still speak to us with voice that it is our privilege to hear. These are the pleasurable pursuits that lie before you.

This in olden days was called "the camp of the explorers;" let it be the camp of the explorers still; and let them take for their guides such as those who have come here to address us this afternoon, and to whom, without further preface, I shall now give place.

THE PHYSICAL HISTORY OF GREYSTOKE PARK AND THE VALLEY OF THE PETTERIL.

BY J. G. GOODCHILD, H.M. GEOL. SURVEY, F.G.S.

*An Address delivered before the Cumberland and Westmorland Societies in 1881,
at Greystoke Park, Penrith.*

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INTRODUCTION.

AMONG the many subjects that an attentive study of the geology of a district is sure to bring more or less into prominence, one of the most interesting to the student of the present day is that of the history of the changes that have resulted in producing the surface features of the district around him. The subject is interesting even where the configuration of the surface happens to be tame and flat; but where we have to deal with a complex series of changes resulting in scenery of as varied a character as that we have the good fortune to find ourselves surrounded with here, so many features of interest present themselves that it becomes difficult to give to each its proper share of attention on such an occasion as the present. It will therefore be necessary to notice only the leading points of interest, and to do little more than refer to much that, if there were time, it would be well to discuss at greater length.

Persons unacquainted with the results of modern geological research are apt to content themselves with the belief, well-expressed in the phrase, "as old as the hills," that the natural features around

them date back from the earliest period of creation, and that they will remain unchanged and unchangeable to the end of all time. I do not now intend to enter upon the history of the changes of opinion that have led up to the views now commonly received; most of us are well aware that Hutton and Playfair, Lyell, Ramsay, Jukes, Geikie, and others, have done much to place the subject before us in its true light; while, from the members of the Cumberland Association we have had a contribution on the "Physical History of the Lake District," by Mr. Ward, which appeared some years ago in the pages of "Science Gossip"; and we have more recently a paper by our Association Secretary, Mr. Kendall, dealing in the same way with West Cumberland, which has appeared in Part V. of our "Transactions." Mr. Ward confined his attention chiefly to the area occupied by the Older Palæozoic rocks of the Lake District, which alone furnished matter for an article of some length. I propose to supplement his observations by offering a few remarks upon such points in the history of our present surroundings as seem to present features likely to prove of general interest.

THE HISTORY AND THE PHYSICAL RELATIONS OF THE ROCKS.

Most of us are already well aware that the rocks around us form part of the Carboniferous series—rocks so called because the one feature that distinguishes them as a whole from the rocks above and below them, here, at least, is the occurrence of beds of coal, which, in one part of the kingdom or the other, may be found occurring at almost all horizons, from the top of the Coal Measures down to the very base of the series. The particular members that come before our notice on the present occasion belong to the lower part of the series, or Carboniferous Limestone. These rocks, with some few exceptions, were accumulated here, and over greater part of the British Isles, chiefly in the clear water of the open sea. The limestones consist very largely of the calcareous remains of the marine animals of that remote period, imbedded in a calcareous paste, which binds all the fossils together into compact rock. But in no case I have yet seen do any of these represent old coral reefs.

If we were to follow these rocks for many miles, towards either the north-west or the south-east, keeping in a general way at much about the same distance from the Silurian area as we are here, we should find ourselves keeping to beds of nearly the same general character, and often indeed we should keep to the self-same bed of rock. The beds would be found to be thicker and to increase in importance as rock features as we followed them towards the south-east, (where deeper water conditions prevailed when the rocks were formed,) while they would be seen in a general way to diminish in thickness, and consequently come less into prominence as rock features as we followed them in a north-westerly direction. A traverse in a direction at right angles to this—from the Lake District outwards towards the Cross Fell Escarpment—would bring us, at almost every step, to rocks differing in some way or other from the rock we started from. We should find a series of layers of limestone, sandstone, and shale, piled one over the other, and tilted in such a way that one sheet of rock comes on above another, in the direction of the Cross Fell Escarpment, until we reach the highest beds exposed in that direction. To put it in another form one may say that, starting from the valley of the Petteril, over Penrith way, and walking up the gentle slope between there and here, we should come upon bed after bed rising out of the ground, at a rate somewhat faster than the general rise of the surface, until we eventually reached the very bottom of the series, and came down upon the central core of Siluro-Cambrian rocks, which rise from underneath the base of the higher group. It is important to realise that the older strata of the Lake District pass underneath the rocks where we now stand, and form a floor, extending hence right across to the Pennine Fault, which abruptly elevates them from a great depth below the surface once more out to the day. This Sub-carboniferous floor or plain is the First Plain referred to below.

If we were at a somewhat higher elevation than we are at the present moment, it would be apparent that, although we are standing on rocks known to be low down in the series, the higher rocks about Penrith form much lower ground than our present station ;

and it would also be seen that the minor inequalities of the surface that interrupt the general regularity of the slope do not much affect its character as a gently inclined plane. It hardly requires a trained eye to detect the evenness of this same plane where we catch its profile on the far side of the Eamont yonder between Hiuska and Cliburn. That slope is formed by the edges of well on to two thousand feet of strata, which strata once extended over the whole of this district, and which, thick as they are, form but a remnant of a once much greater mass. I believe we have evidence of the former existence here of some thousands of feet more of Carboniferous rocks than we now find around us, and a little reflection will convince any one that for this great thickness of rock to accumulate beneath the sea the rocks we are now upon must have been depressed to a corresponding depth beneath the surface. In other words, this limestone crag where we now stand, which is now well on to a thousand feet above the sea level, at one time went down several thousand feet below that level—probably as much as a mile. We get evidence that the depression went on with extreme slowness, and that this depression was often interrupted, and the rocks sometimes remained stationary, or even oscillated between a movement downward and one in an upward direction.

THE THREE PLAINS OF DENUDATION.

At last came a time when the predominant downward movement of the earth's crust at this point changed to a movement in the opposite direction. And, just as the downward movement had been unequal in various parts, so the rate of upheaval also was not by any means uniform over the whole district. The newly-formed rocks, in undergoing upheaval, may be said to have been bulged up from divers centres, and one of these centres, or groups of centres, lay over what is now the Lake District. So it happened that the sheets of newer rocks enveloping our Lake District were the first to be brought within the destroying action of the waves, and bed after bed was denuded—ground down into sand and mud and swept away to form rocks anew elsewhere—until in the end the very base of the series was cut through and the old Siluro-

Cambrian rocks were once more exposed to the day. The destruction of a hundred or more cubic miles of rocks, which was stripped off the surface of this part of the country at the period I am referring to, did not, we may feel sure, take place in a year, or a hundred, or a thousand years. On the contrary, everything points to all these great geological events of the past having gone on as slowly and as imperceptible as such changes are known to be taking place at the present day. The end of it was that the whole surface of the country was shorn off to one general uniform level; depressions and elevations there were, beyond a doubt, just as there are both depths and islands left on a modern plain of marine denudation; but in the main the surface was tolerably uniform. The history of this plain is an important part of the history of the surface around us, and much of the rock scenery here has been carved out of re-exposed portions of that plain itself. I have generally referred to this plain between the New Red and the rocks beneath as the Second Plain: the First Plain being the one at the base of the Carboniferous rocks. Both, of course, have undergone more or less disturbance since their formation, and these disturbances affect the character of the plains themselves when they are re-exposed by the removal of the rocks that once covered them. It must not be supposed, however, that the minor features of Greystoke Park began their history at the date I refer to. We have yet a long series of changes to take notice of.

What happened after the formation of this plain nobody knows for certain. It is quite possible that it may have again sunk beneath the waves and received other deposits on its surface that have gone and left us no trace of their existence behind. All we do know for certain is that a very long interval of time elapsed between the time of formation of the last of the Carboniferous series and the commencement of the next or New Red Period; time enough to admit of the consolidation, the upheaval, and the subsequent denudation of well on to twenty thousand feet of Carboniferous rocks; and time enough to admit of the gradual substitution of quite different forms of life for the forms whose remains we find entombed as fossils in the Carboniferous series.

NEOZOIC ROCKS.

Then came a change once more. In place of the wide-spread marine conditions that prevailed during the Carboniferous period, we get evidence of this district having formed part of a large continental area. Instead of accumulations of pure grey limestone taking place in the clear water of an open sea, we get evidence of the subaerial waste of an old continent somewhere out to the east of England being brought down by rivers, and swept about by strong and ever-changing currents, in a large inland lake, whose nearest analogues at the present day seem to be the Caspian, the Dead Sea, Lake Lahontan, &c. Instead of the varied and abundant life of the Carboniferous period, we find a few dwarfed and stunted forms, which seems to suggest by their form and their size that they struggled through life under conditions anything but suitable for their full development. Part of the time the waters of the old inland lake seem to have been so surcharged with the iron, the lime, the salt, the magnesia, and the various other substances carried down in solution by the rivers, that it was possible for only terrestrial, or, at the most, amphibious, animals to subsist there. Strange, uncouth-looking monsters many of these were, too, if one may form any idea of their shape from the scanty traces they have left here; and it is far from unlikely that we may now, at this crag, be only a few feet below the former level of the surface where these gigantic frog-like, tortoise-like, lizard-like, and bird-like animals once roamed on the shores and waded in the shallows of the old lake. For we have evidence that this old lake, and the rocks that were accumulated in it once went completely over the spot we now stand; and I believe there is also evidence that it extended also over the Lake District as well, for the Lake District, I believe, had not been upheaved and denuded into existence as a mountain region in those old days.

Conditions similar to what I have endeavoured to describe prevailed throughout the entire period of formation of well on to four thousand feet of rock. Then came a change, and the sea once more gained admittance. I would point out that in this fact we seem to get evidence that the old inland lake must have occupied

a position at a considerable elevation above the level of the sea. If this was not the case, then its continued existence as a lake through so long a series of depressions must have been due to great local irregularities of the downward movement of the earth's crust. After the sea gained admittance here we know that the Lias at least was deposited ; and I see no reason whatever why the Oolites and other Secondary Rocks should not have overspread these parts as well. At any rate, and whatever view be taken, it is tolerably certain that this part was again submerged, and it may have been submerged to a considerable depth.

THE THIRD PLAIN.

Again the cycle of change brought about different conditions. The steady subsidence of the land that had been going on for untold ages—if we may trust the estimate of the time furnished by observation upon the modern rate of change in the organic world—once again gave place to an equally slow movement in an upward direction. History is said to repeat itself. Geology, which is only history extended into the remotest periods of the past, seems to repeat itself also. The changes that took place at the close of the Carboniferous period were repeated at the period I now refer to. At some time after the formation of the Lias, and probably at a period following the deposition of the Oolites, the newly-formed rocks were once more brought to the level of the breakers, and planed off as before. The inequality of movement was repeated, and one at least of the centres of upheaval coincided, or nearly coincided, with the centres of upheaval of old. As before, the area that is now the Lake District went up faster than its surroundings. It suffered also denudation to a great extent. All the rocks that had covered it—the newer Secondaries, the New Red, and the Carboniferous rocks, where these existed—were one after the other swept clean away ; and the surface of the rocks exposed in consequence was shorn off to one nearly uniform level, which bore no relation to, and was in no way affected by, the diversities in structure and hardness of the rocks that composed it. I believe that it was at this period that the plain represented by the general summit

level of our Lake Country fell-tops was formed. The newest plain in Edenside—the plain that one can trace in a nearly continuous strip all along the foot of the Cross Fell escarpment, and round by Carlisle is also of this age. To the same period of formation would I also refer the plain of much of the great upland region extending away from Cross Fell eastward—for I believe that the summit levels of this upland tract once formed part of a continuous plain with that lying two thousand feet below it at its foot, and that it has been dislocated by the Faults at a late Tertiary period, and the separated fragments heaved asunder into their present respective position. This plain I have generally referred to as the Third, or Subcretaceous, Plain.

Even at the period now referred to, which I regard as coeval with the earlier Cretaceous rocks, there seems to be no proof that any part of our district had assumed the character of a permanent terrestrial surface. Certain phenomena that I can now only refer to, seem to prove that the extensive plain I have last spoken of was covered nearly everywhere by yet a newer deposit. Unfortunately, we are not in the possession of any direct evidence as to what was the precise nature of this deposit; the scanty evidence we do get seems to point conclusively to it having been a rock more easily denuded than any of the stratified rocks in this district; but whatever the rock was, it was gone; and all I can say is that scraps of evidence gathered here and there all over the country seem to me to point to this rock having been the Chalk itself, or at all events some rock of that age and of that general nature. We may have had other rocks here as well, but there is not a scrap of evidence of any kind to prove that point.

APPROXIMATE DATE OF THE LAST GREAT DISTURBANCE.

It is now left to discuss the question at what geological period the last emergence of our district took place. Here again we are left very much in the dark. Hardly any feature existing in the whole district enables us to throw any light upon this question; but by piecing together the evidence afforded by the geology of other parts around, we can get some kind of clue, which may serve

as a sort of guide in fixing approximately the date of this geological event, so important in an inquiry like the present.

Many geologists are inclined to place the last emergence of this district at a period somewhere in the very remote past, and at first sight there does not seem to be any valid reason why it should not have been so. But when we turn to a study of the great physical features of the Continent of Asia, and of America, and observe the nature and the extent of the effects that geological causes have produced within a comparatively modern period of the earth's history, we may well pause before assigning too remote an age to the comparatively trifling series of events that can be recorded here. Who is there that has fully realised what geological causes have effected in the Alps, in Auvergne, in the Western Isles of Scotland, in the Himalayas, and elsewhere, since Miocene times, that is prepared to maintain that similar results cannot have been produced here in the same time? We get evidence of movements of elevation and of depression surpassing in extent almost anything we can point to here. We have clear evidence of a prodigious amount of denudation, and thus, of course, proof of a corresponding amount of deposition of sediment. Almost the entire aspect of many parts of the Continent has been completely changed by these causes since the Miocene period, and it does not seem to be going too far, if we say that, so far as physical changes known to us by their results are concerned, the interval that has elapsed between this Miocene period and the present day is one of the most important the geologist has to deal with. It would be no very difficult matter to bring forward proof that since the last great physical changes have affected this district as a whole, and therefore the particular part of it we are more immediately concerned with, a comparatively trifling amount of denudation has been effected. I will refer to one, which will, I think, well exemplify this. Most of us know that a great series of dislocations, known collectively as the Pennine Fault, ranges along the foot of the Cross Fell Escarpment. The plane of that fault marks off the limit of the rocks composing the Escarpment. It is because of the Fault that they are there. The Fault cuts them off from their equivalents under

the Red Rocks of the Eden Valley, and admitted of their upheaval to their present elevation ; therefore it is impossible that they can have ever extended farther in this direction at their present elevation than the plane, or upward continuation, of the fault. Now the very summit ridge of the Escarpment is frequently less than a mile back from the fault ; that is to say, the part that has been most cut back by denudation has receded only a mile. But the more prominent features of the Escarpment are at a much less distance than that, showing that the actual amount of denudation since the Escarpment first saw the light has been comparatively trifling. Subaerial conditions have affected similar rocks on the Continent and elsewhere to a much greater extent in post-Miocene times, and it therefore seems fair to conclude that, if less denudation has been accomplished here since a certain geological event, that event has in all probability taken place at a much more recent period. I would therefore approximately fix the date of the last upheavals here at the Miocene period, and would account for the comparatively small amount of denudation the Escarpment and some other points have undergone since, by supposing that it is only in times much more recent that Edenside has been cleared of the Cretaceous rocks. Much of the denudation that every subaerial tract is inevitably exposed to having been expended in clearing out these newer deposits ; so that it is only at a comparatively recent period that the subaerial forces have been able to attack and to modify the features of a large part of the surface.

Now, it was at some post-Miocene period, I believe, that the principal rivers of our district began to flow. I have endeavoured to show on a former occasion* that these rivers started into existence at a time when the entire surface of the country was occupied with rock of one uniform character, and that the great water-shedding line of this part of England lay somewhere nearer this way than its present line along the Pennine range over there. Also that the rivers had their courses so well established in this rock of uniform character, that, when subaerial denudation had proceeded so far

*Address at Nunnery Walks in 1880, published at the time in the *Carlisle Patriot*, &c.

that the old plains of marine denudation began to be re-exposed, the rivers still went on, as nearly as possible, in their old direction, regardless of the differences in hardness and in power of resistance to atmospheric forces presented by the rocks they were traversing. Now, all the rivers flowing outwards from the Lake District have had to cut their way across rocks that vary greatly in their rates of destructibility. One rock that will stand exposure to the weather for hundreds of thousands of years, and be in the end not much the worse for wear, may overlie, or may pass beneath, another rock that wastes away to an appreciable extent in a single lifetime. Only to-day I have been looking at two sets of glacial striæ that I first examined no more than ten years ago. The first set is that on the surface of the sandstone we looked at at Blencowe to-day, which striæ are just as sharp as they were ten years ago. The other set is close to Penrith, and occurs on limestone, near Redhills. Ten years ago they were quite fresh, and clear enough to catch the eye of a casual passer by ; but exposure for only ten years has resulted in reducing what was then a smoothed, or even polished surface, to one that is now perceptibly rough to the feel. The effect of the carbonic acid in rain water has been to dissolve and carry away part of the limestone, and to remove some of the traces of glacial action with it.

These two cases well exemplify what takes place on a larger scale all over the district. The beds around us here in Greystoke Park, first appeared as a nearly uniform slope, which was formed by the edges of rocks that present very different powers of resistance to the action of the weather. These inequalities of resistance to waste and decay may be slight in themselves, yet when the rocks are acted upon for a very long period, these differences tell up, and in the end give rise to diversities of surface of so much importance that one is disposed at first sight to attribute them to causes acting with more intensity.

VARIED HISTORY OF THE PETTERIL.

Our rivers here began to flow when the surface then existing at this point was nearly or quite two thousand feet higher relatively

to our present standpoint than it is at present—the rocks that composed that old surface having been long since entirely removed by the action of subaerial forces. As the general level of the surface wasted away and sank somewhat nearer to its present level, part of the last-formed plain—the Subcretaceous Plain that I have mentioned as being traceable here and there over greater part of the British Isles—began to be re-exposed, and the rivers that had already established their courses in the Cretaceous rocks began to be guided downward into rocks of quite a different character. Still, they went on all the same. Just as the acid used by the engraver bites downward into the hard plate of metal only along the lines where the etching ground has been scratched away, so the erosive action of the streams was guided downward through the upper rocks they began to flow in until their courses were fairly established in the harder and more diversified rocks beneath. Let us confine our attention for the present to the Petteril, as we are actually on the river banks of that stream at the present moment. According to the view here advocated, the Petteril at first started to flow somewhere out on this side of Stybarrow Dod, probably along the course now taken by the upper part of Aira Beck. Thence it flowed away between what is now Great and Little Mell Fells, across what is now a wide east and west valley. Then past Penruddock, Greystoke, Plumpton, and thence taking the valley south of Lazonby Fell, and joining the Eden near Great Salkeld. There are many reasons for believing that the Petteril maintained this channel for a considerable period—quite long enough to give rise to the formation of such valleys as this before us, where the Petteril has excavated a few cubic miles out of what might otherwise have been a continuous escarpment of Carboniferous rocks extending in an unbroken ridge across from Summerground Craggs to Fluska Pike.

But the rocks about the base of the Carboniferous Limestone series waste away at a faster rate than the beds higher up; in other words, if we had a level surface to start with, composed partly of the softer beds below, and partly of the limestone itself of Summerground Craggs, this limestone would dissolve fast, but the softer

beds below would go faster, and the lower rocks would soon begin to waste away into a gradually-deepening depression, until they sank far below the point reached by the limestone escarpment. In this case it has to be remembered, of course, that we are dealing with the outcrop, running transverse to the general course of the river, of a soft stratum occurring between two of a much more durable nature, and one that wastes faster than the rate at which the river itself erodes the harder beds above it and below.

Thus it was, I believe, that the head waters of the Petteril were cut off, somewhere out between Penruddock and Mell Fell. The Petteril went on deepening and widening its channel here until the unequal waste of the surface formed by the soft rocks about Dacre developed a channel all along the line where these same soft rocks cropped out, that is to say, along a zone ranging transversely to the general direction of the river valley. Eventually the Petteril was cut in two by this unequal lowering of the surface it traversed, the water draining down from about Gowbarrow Fell being turned into the new channel that now contains Dacre Beck; while the remaining moiety of the Petteril had to make a fresh start as best it could, with such drainage as gathers about Motherby and Penruddock.

The same kind of thing happened near Plumpton. The Petteril once flowed straight away from the Carboniferous area across what is now the escarpment of the Penrith Sandstone, instead of turning to the north as it does now. But this escarpment consists of an upper layer of hard and durable beds of sandstone, which overlies a lower series of beds of a much more perishable character. A surface consisting of beds belonging to the whole series would therefore naturally tend to waste to lower levels at a faster rate where the soft beds cropped out than where they were hard. The strike of these beds is here north and south, with an easterly dip. Consequently, in the general waste of the strata, there is a tendency to a general lowering of the surface in a north and south direction, along the outcrop of the softer beds; while, on the other hand, the harder top beds continue all through in the form of an escarpment, which is receding towards the east. The hard beds

were left at nearly the original elevation, corresponding to a part of the Third, or Subcretaceous Plain ; while the soft beds sank into a hollow ranging all along from Penrith to Wreay. So it came about that the waters of the Petteril gradually changed their course there also, and were turned into the new channel that they occupy at the present moment. In this case, as in the other, the deserted part of the river course remains as a col or pass cutting across the escarpment of the Penrith Sandstone.

This instance of the severance of a river, which is afforded by the Petteril, is only one out of many that have come under my notice in England. There are numerous other examples of the same nature abroad in various parts of the world. I believe that the explanation above given will apply to nearly all cases of inosculating valleys, and that the severance of a stream into two, which eventually flow in opposite directions, is almost a necessary consequence of the subaerial denudation of a river valley whose rocks differ so much in their relative durability, that subaerial waste lowers one part faster than the river itself frets its way across the outcrop of the harder beds at a lower point.

ICE WORK.

The last great change that has taken place here is one that, did time permit, I should be glad to dwell upon at considerable length. I refer to the Glacial period. I have elsewhere* given my reasons for believing that the whole of Edenside was once completely filled with ice, which ice attained a thickness of over two thousand feet at one period. This ice was propelled up the valley, from Carlisle towards Stainmoor, not from the mountain land of Stainmoor towards the low ground of the Solway, as it would seem natural it should do. Why it so moved it would take too long to discuss now, and I refer to the subject at all only because the effects of the ice action upon the rock surfaces around us cannot be passed over without some kind of notice. Subaerial denudation had

* "Quarterly Journal of the Geological Society," Vol. xxxi. (1874), and again in my paper on "Ice Work in Edenside," published in our Transactions for 1887.

shaped all the existing features of the surface pretty much as we find them to-day; but the ice that scooped out so many of our beautiful lake basins affected these rocks in a different way. When the ice came here it eroded and ground away the surface more where the rocks were rasped easily, than where compact rocks came in its way; consequently where subaerial denudation would have fretted and corroded away the limestones, and left the sandstones and conglomerates nearly as they were (as it has caused the limestone scars to recede from over Mell Fell down to Dacre, leaving the comparatively indestructible conglomerates behind); the ice, on the other hand, glided more over the limestone, and scraped and rasped away with greater effect on the beds above and below. So it has happened that the soluble and easily-corroded limestone has been left here to form broad sloping surfaces, while the less perishable sandstones are ground back into steep banks.

THE FUTURE OF THE SCENERY.

Subaerial denudation is, however, re-asserting its sway, and we have but to look at the fretted and honeycombed character of the limestone rocks here to see that ere long, geologically speaking, the old order of things will be restored, and the beautiful scars of grey limestone that contribute so much to the natural beauty of Grey-stoke Park will waste away to the general level of the surface, or below it, and will thus give rise to scenery of a character decidedly different.

CONCLUSION.

I will now, in conclusion, briefly summarise the changes that have resulted in producing the present form of the surface here.

These Carboniferous rocks were formed under the waters of the sea countless millions of years back in the past. As they were formed they sank down several thousands of feet below the level of the waves, received a thick pile of sediments, became hardened into compact rock, were upheaved, tilted, and faulted, and their edges shorn off into a great plain of marine denudation, which plain, re-exposed, forms much of the present general surface. Then

they sank again, received another pile of sediment, were consolidated, faulted, and upheaved as before. Then came the formation of another plain of marine denudation, shaped at this point out of the Red Rocks, which formerly extended over here. Yet again they went down, to be once more enveloped in newer deposits.

Lastly, they were upheaved again, for the last time, in the Miocene period; the rocks were exposed for a period that we are unable to form any conception of, and again denuded still further, so that the two prior-formed plains of marine denudation were re-exposed. Then, out of the rock composing these two older plains, subaerial denudation has since been unceasingly at work carving hill and dale, escarpment and dip slope, out of the old marine surface. And, afterwards, came the ice of the great Glacial Period to smooth and round and impart flowing contours to the irregularities of the surface produced by weathering. And, last thing of all, comes in subaerial denudation again to replace the smooth contours and sweeping curves imparted by the ice with its own evidence of that waste and destruction which all we know of geology tells us has been going on from the remotest periods of the past, and which, we may feel sure, will go on until the very end of time.

THE OLD LAKES OF EDENSIDE.

BY J. G. GOODCHILD, H.M. GEOL. SURVEY, F.G.S.

Read at Long Meg, before the Carlisle and the Penrith Societies, in September, 1883, and published in the CARLISLE JOURNAL of that week.

THE history and the mode of formation of the beautiful lakes that form so characteristic a feature of the mountain districts lying to the south of the lowland tract where we are now standing, has long been a fertile subject of controversy amongst geologists, and, if we may judge by different opinions that are constantly being put forward, many of the questions relating to the lakes are likely to remain for some time without satisfactory answers at all. But in the district referred to the lakes are there, at all events, and anyone has an opportunity of judging for himself how far this or that particular explanation may appear to him to be satisfactory. Where we now are, however, it will at once occur to many that there are no lakes to afford matter for discussion, and that, so far as can be seen, there are no signs of there ever having been any lakes in this part of Edenside at all. It is my object at present to direct attention to the evidence that has led me to the conclusion that such lakes have really existed here, leaving the discussion of their origin as a question of lesser importance. To render the subject intelligible, it will be necessary at the outset to pass in review the characteristics met with in connection with the lakes, yet existing as such, in other parts of the two counties, in order to see how far the same characteristics may admit of being traced at the present day here.

The leading features connected with the mode of occurrence of our lakes may be stated thus. They occur in greatest force in the most mountainous parts, and they usually occur in such a manner in relation to the stream that enters their upper end and emerges again at their point of outflow, as to suggest that they represent little else than a local dilation, or enlargement, of the banks of the river itself. I would refer, as familiar illustrations of this feature, to the course of the Eamont in relation to Ullswater; to that of the Derwent in relation to Derwentwater and Bassenthwaite; to Wyburn Beck in relation to Thirlmere; the Liza to Ennerdale Water, and to many other instances of the same general nature that will immediately occur to everyone in the least degree familiar with the physical geography of Cumberland and Westmorland. In each and every one of these a little reflection will convince any one that the occurrence of the lake is but a temporary and accidental condition of the course of the river, brought about by exceptional events at a late period in the history of the valley where they occur.

Another point that will be noticed is that there is a marked tendency in all grouped lakes to occur in chains, separated either by ordinary narrows, such as close in upon the sides of Thirlmere near Armboth, or else by long stretches of alluvial land, such as separate Buttermere from Crummock Water, or Derwentwater from Bassenthwaite. It will also be noticed in many cases, and it can be proved by soundings in many more, that the lowest parts of the bed of each lake are several feet below the rock occurring in the bed of the river at or near the spot where the lower end of the lake merges into the river. In other words, a line drawn from the lowest part of almost any one of our lakes to the first mass of solid rock that occupies the bed of the river at the outlet of the lake, would be found to run uphill, instead of downhill, as is the case in the bed of a river in its normal condition. Very commonly, also, this rock barrier at the foot of the lake rises on each side of the outlet in such a way as to suggest that it once extended across the outlet of the lake at a much higher level, which level has since been lowered by the erosive action of the river. This rock barrier

also very frequently coincides more or less with the point where the rocky walls of the lake close in upon it, so as to hem in the waters within a narrow channel. Even where the rock barrier is not very obvious as such, its actual existence can be proved by the fact that the river has to chafe its way out from the lake over a stony bed consisting of the fundamental rock occurring at that part. It is quite obvious on inspection in either case that the river itself is constantly at work lowering this barrier; and, with the lowering of the barrier, it is tending also to lower the general level of the water dammed up by that barrier.

Turning attention to the upper end, or inlet, of the lake, it is sufficiently obvious in the majority of cases that the lake is there being gradually silted up by the wasted materials swept down into it from the valley above. The silt in such cases forms an alluvial flat. Such alluvial flats can usually be traced upwards from the gradually-shelving water at the head of the lake, through the rushy land above, up to high and dry holm land that may rise many feet above the general level of the water. There is hardly any one of our lakes that does not afford an illustration of this. But as examples of what is meant, I would refer to the alluvial flat at Patterdale, above Ullswater; to that at Grange, above Derwentwater; the alluvial flat west of Honister Crag, at the head of Buttermere, and many others. In all of these we may feel tolerably certain that, to whatever height the alluvial tract may be traceable, that height marks one of the former levels of the water of the lake below it. We may also feel tolerably certain that any difference in level between the former height of the water of the lake and its level at present is due to the lowering of the outlet by the erosive action of the river.

There are thus two causes constantly at work tending to restore the former conditions of things in the case of lakes, and to leave river courses of the ordinary kind at the bottom of the valleys in place of the lakes themselves. The first is the gradual lowering, by erosion, of the barrier at the foot of the lake; the other is the equally constant tendency to become silted up. Lakes act as most efficient filtering pools, mainly by checking the rate of flow of the

streams carrying material to them, whereby the transporting power of those streams is reduced almost to *nil*.

The silting-up process proceeds with more or less rapidity, in proportion to the rate of waste of the drainage area above it. In some cases this goes on at a very slow rate, when measured by years, as can be shown by the existence of Roman stations on some of these old alluvial flats, which are even yet at no great distance from the head of the lake. That at the head of Windermere is an excellent example. If one may judge by this instance, it is clear that the Roman invaders of Britain must have seen our lakes in very much the same state as we see them at the present day; so imperceptible is the rate of sedimentation in many such instances.

In other cases, the easily-eroded nature of the barrier that dammed back the waters of the lakes, has caused the water to be drained off before much sediment had time to accumulate. An instance of this kind must have occurred in the neighbourhood of Threlkeld, where a rock barrier, consisting of Skidda Slates (a rock easily eroded), once extended in a south-westerly direction right across the Greta to the west of the Penrith-Keswick road. This barrier must have shut in a considerable hollow, that certainly contained a lake, before the Greta worked its way down through the confining ridge to its present level. Threlkeld stands only a little above one of the former shores of this old lake.

In other cases the rate of lowering of the rock barrier has been sufficiently slow to admit of the accumulation of a considerable mass of sediment, especially in such cases as those where the drainage, and, consequently, the subaerial waste, of a large area is received by the stream. What I am aiming to show is, that every gradation may be traced between a perfect, unmodified lake, with little or no alluvium, and the wide-spread holms that (except during heavy floods) have nearly or quite ceased to resume the character of a lake at all. But, whatever may be the present condition of the lake, the features I have just referred to as the essential accompaniments of the lakes are usually traceable. Every intermediate gradation may thus be traced between some of our largest sheets

of water, like Windermere or Ullswater, and irregular expansions of alluvium, such as would result from the silting-up of such lakes. When, therefore, we meet with similar chain-like expanses of alluvial flats occurring in connection with the courses of rivers, we are justified in regarding them as evidence of the former existence of lakes on their present site. This kind of evidence amounts to little short of absolute proof, if it can be shown that the termination of the alluvial tract coincides with the occurrence of a rocky channel in the river bed. If, in addition, that rocky channel is hemmed in on each side by steep walls, of the same rock, little or no further proof is needed, and we may safely regard the alluvial tract above the barrier as occupying the site of a veritable rock-basin, which, at a period not very remote, once contained the waters of a lake.

It is hardly necessary to point out that the essential conditions I have referred to are all present in the case before us. Looking in the direction of Carlisle, we find here a rocky gorge, wherein the Eden is chafing its way seawards through some of the very toughest and least-easily eroded beds of the Penrith Sandstone, and the rocky walls that hem it in at this point occur in such a way as to suggest that at no very remote period the channel of the river lay many feet higher than its level is at present. Turning our attention, from our present standpoint near the rock barrier, in the direction of Appleby, we find a great alluvial flat, which is, as the farmers know to their cost at the present day, very often converted into a series of small lakes during heavy floods, when the quantity of river water flowing seawards is partly dammed back by this barrier. With minor narrows, this alluvial flat can be traced all the way up to Appleby, where it is found to terminate against the end of the gorge below Appleby Castle ; a gorge in that case, as in this before us, consisting of a hard barrier of Penrith Sandstone, notched into a deep groove by the action of the river. The lakes do not terminate at that point, however, for if we follow the Eden up as far as Clint Scar, the point where the Midland Railway now crosses, we come upon a very beautiful scar that evidently extended quite recently right across the river. The barrier here, and the

remains of its former extent represented by the scars on each side, occur in the same way in relation to a wide-spread series of alluvial flats extending above that point to near Winton, as this Eden Lacy rock barrier spans the Eden here and terminates the alluvial flat before us. That the Eden at Appleby Castle, at no very remote period, flowed at a much higher level than it now does is rendered tolerably evident by the occurrence, in the scar below the Castle, of vestiges of great pot-holes, exactly like the pot-holes that the Carlisle Society examined under my guidance a year or two ago in the course of the Ive below Hight Castle. These Appleby pot-holes were formed, beyond a doubt, in precisely the same way as those were.

Turning our attention again in the direction of Carlisle, we find that the rock-barrier at Force Mill gradually falls in elevation, as it is traced towards the north-west; so that within a few hundred yards of this point we again enter upon another wide alluvial tract, extending past Lazonby to just below Kirkoswald, where yet another rock barrier rises, and is continued past Nunnery Walks, Sampson's Caves, and the beautiful scenery that adorns that part of the Eden, thence as far as Armathwaite.

We have thus evidence of at least three lakes, which once formed a chain extending along what is now the course of the Eden, from Kirkoswald to Lacy Caves; from Force Mill to Appleby; from Clint Scar up to Winton; and thus rivalling in extent, if not in the grandeur and beauty of their surroundings, with any of the lakes that can be shown to have existed at any former times within the Lake District itself. What has happened in these cases, as in so many others, is that what was originally a rock-basin filled from end to end with clear water, has gradually been drained by the lowering of the outlet; while the rivers flowing into it have carried down, and spread out beneath the waters of the lake, the detrital matter they have transported from the higher parts of their respective drainage areas. This detrital matter is now the alluvium.

In the case of very large lakes the amount of sediment accumulated in this way, represents nearly the whole of the waste that has been stripped off the surface of the part above the point where the

stream enters the lake during the time intervening between the date of formation of the lake and the present day. The alluvium about Grange, above Keswick, thus represents the amount of waste of the rocks of the Borrodale area since Derwentwater was formed. The small amount of waste in this case is probably due to the slow rate of destructibility of the tough volcanic rocks that occupy the area drained by the streams whose united waters enter Derwentwater at this spot. The much-more extensive waste of the Skidda Slate area is evidenced by the correspondingly larger accumulation of alluvium that has been brought down into the lower part of the same sheet of water by the Greta; an accumulation large enough, when united with the waste of the Newlands area, to fill up the whole of the lake at the part where Keswick now stands, and thus to divide a once-continuous sheet of water into the separate lakes of Derwentwater and Bassenthwaite.

I have referred to these instances, in some detail, in order to make a comparison with the larger quantity of alluvium spread out in the bottom of these Edenside Lakes; a quantity much in excess of anything that can be pointed to in the Lake District proper. This excess is due partly to the more rapid rate of destructibility of the rocks of Edenside as compared with the rocks of the Lake District; but mainly to the waste of the wide-spread deposits of glacial drift that spreads over nearly the whole of the lower ground drained by the Eden.

It will thus, I think, be tolerably evident that the date of the lakes of Cumberland and Westmorland, including, of course, that of the old lakes before us, though remote enough when measured by the standard afforded by history, cannot be very remote when estimated by a geological standard of time. What that date approximately is I will now endeavour to show. It is tolerably clear at the outset that each lake is very much newer than the valley wherein it lies; for the quantity of material heaped up in the rock basin forms but a very minute fraction of the total quantity excavated during the formation of the valley itself. It is also clear, from the occurrence of mounds of glacial drift here and there throughout these Edenside lakes, and especially in the case of this Langanby

Mere (as for convenience of reference I shall venture to call it)—it is tolerably clear that the rock basin must have been in existence at the close of the Glacial Period. Langanby Mere, however, did not, by any means, present the same appearance at that time that it did at a later time ; for there is evidence that soon after the close of the Glacial Period the waters of this Mere stood at a higher level by thirty feet, or more, than the level of the present alluvium. Here and there, all the way down the valley to near Kirkoswald, occur terraces that, to my mind, have clearly been formed along the margin of the old Mere ; and the loam and sand composing these old terraces shows, in places, the most evident signs of the action of floating ice. Similar appearances are very common, in fact, are general, all over the higher lying terrace deposits of the rivers in the South of England.* These signs of glacial action consist of strange contortions of the beds of loam and sand, of exactly the same nature as would result from the bumping of large masses of floating ice against the soft sediment accumulating beneath the waters of the lake, and the consequent kneading of these soft masses into a confused mixture of sand, gravel, and loam. Now the drift occupying the bottom of the rock basin of this Langanby Mere contains a very large percentage of boulders, whose sources can be traced from the lower parts of Edenside, from the Lake District, and from Scotland. I want to call particular attention to this evidence of the transportal of boulders up the valley—from the low grounds towards the head of the valley, and over it into Yorkshire, because other people with whose theories this fact did not happen to agree, have hitherto persisted in ignoring it entirely. This upward transportal of drift must have taken place under very exceptional conditions, which it would take too much time at the present for me to discuss in detail. But, in brief, I may state that we have evidence, and what many of us consider very good evidence, too, of the former presence of a great mass of land ice, quite two thousand feet in thickness at our present standing place, which moved up the valley from the low ground of the Solway, in one direction over the Bewcastle Fells, into the valley of the Tyne, and in the other direction—that is to

* Proc. Geol. Association, vol. ix., No. 3.

say, in this—it moved up the valley and over what are now the wild moory uplands of Stainmoor, out to the Yorkshire coast. That great ice sheet has scored and furrowed the whole of Edenside with deep grooves from end to end. It has scooped out rock basins innumerable all along the Cross Fell side. It has ground the valley heads in many places into cirques, corries, or coums, such as the very perfect coums at Haska Fell and Ousby, and has left its impress in many other ways up and down all over the surface of the country it traversed. It was this ice sheet that scooped out the rock basins wherein Lazonby Mere, Langanby Mere, and the Appleby Meres once lay; as it was ice belonging to the same period that scooped out the lakes and smoothed off the older weathered features of the rocks in other parts of Cumberland and Westmorland.*

We have then, it seems to me, some kind of evidence of a tolerably complete sequence of events here, dating from the close of the Glacial Period down to the present day; so that it is far from unlikely that Langanby Mere, Lazonby Mere, and Appleby Mere, may in times past, have formed the fishing grounds, or even the dwelling place, of some of the early races of men, such as have left vestiges of their existence here in the form of such megaliths as the stone circle Long Meg and her Daughters above us; or of the various peoples that have left us other traces of their existence here in the form of the Neolithic stone implements that are now and then found. To my mind the alluvial flats before us, and perhaps the much older terraces that occur at higher levels along their banks, may contain not only the fossil remains of these men and of their works, but also of the various races of wild animals—bears, beavers, wild oxen, horses, wolves, and of other animals that formerly peopled these parts, from the close of the Glacial Period down to the dawn of history.

* See the present writer's "Glacial Phenomena of the Eden Valley," &c., *Q.J.G.S.* xxxi. (1874), and "Ice Work in Edenside," *Trans. Cumb. and West. Association*, Part XII.

ADDITIONAL NOTES ON PALLAS SAND-GROUSE.

PROFESSOR NEWTON has kindly asked me to supplement our paper on this species; and though my enquiries in Westmorland are still incomplete, I gladly adopt the suggestion so far as Cumberland is concerned. The following lines refer to the most recent notices of Sand-grouse in our midst:—(A) *East Cumberland*. Mr. Tandy has ascertained that two parties of three and five Sand-grouse visited the Penrith district, apparently for the first time, on September 13th and 15th. Near Rockcliffe, a single bird was constantly seen in October. (B) *Cumbrian Plain*. At Orton, Sand-grouse remained throughout September, and two were seen at Newby Cross on the 25th of that month. Mr. George Dawson states that on October 18th a flock of twenty-five flew over his house, calling loudly. (C) *English Solway*. Near Workington an odd bird was seen by Mr. Hodgson early in September. At Beckfoot, near Silloth, five appeared at the beginning of October, but did not remain. (D) *West Cumberland*. The Ravenglass birds lingered on the coast between Eskmeals and Drigg until the middle of October. Our esteemed correspondent, Mr. Reynolds, wrote shortly after the event of their departure, "Please note that the Sand-grouse left here on the 17th inst. They were seen to fly high, but in circles, on that day, and the police officer saw them flying in an easterly direction over Muncaster. They have not been seen since. There were about forty of them."

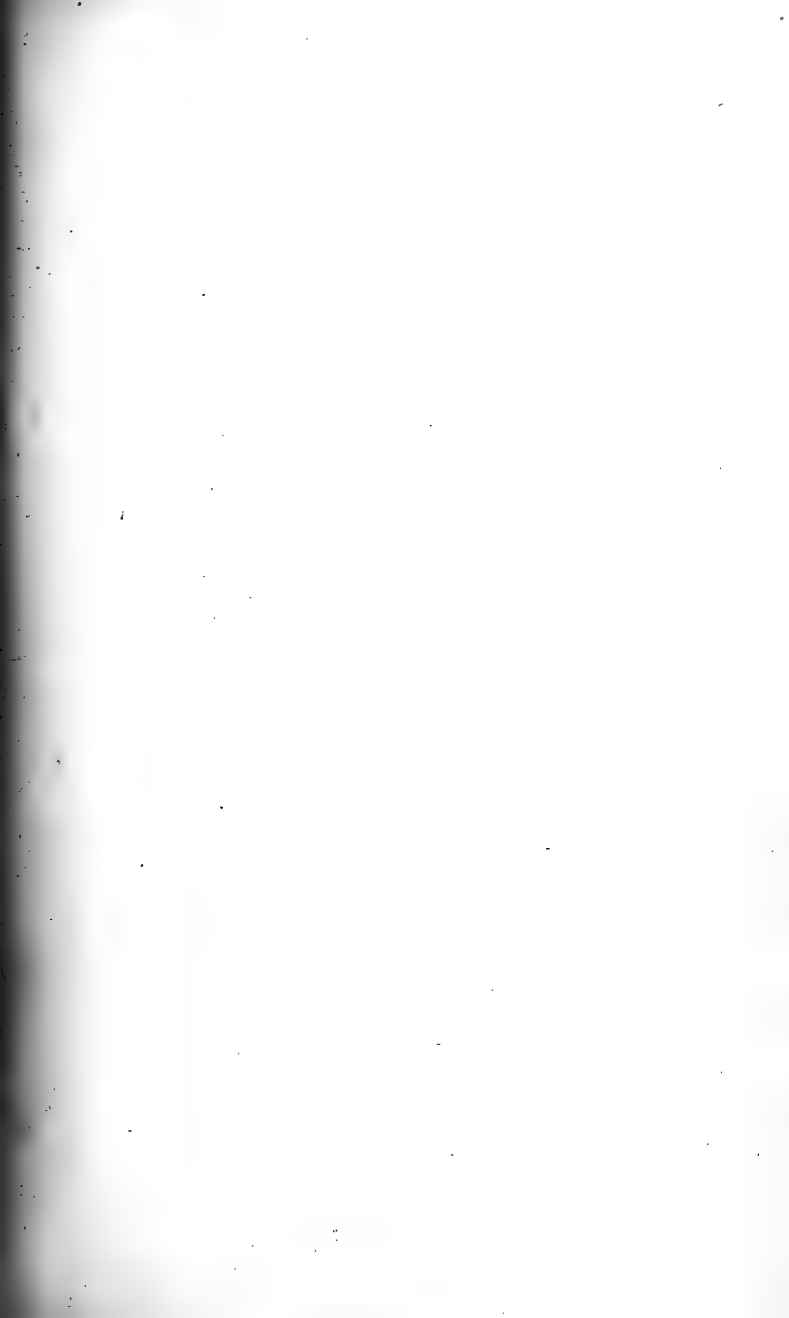
We have to correct three errors which unfortunately crept into our original text. At p. 59, the reference to Pallas should read—Reise. Russ. Reichs. II. App. 712. On p. 66, line 32, "the coure" should read "the course"; lastly, the plant inadvertently alluded to at p. 67 as Glasswort is identical with the Sea Milkwort, *Glaux maritima*.

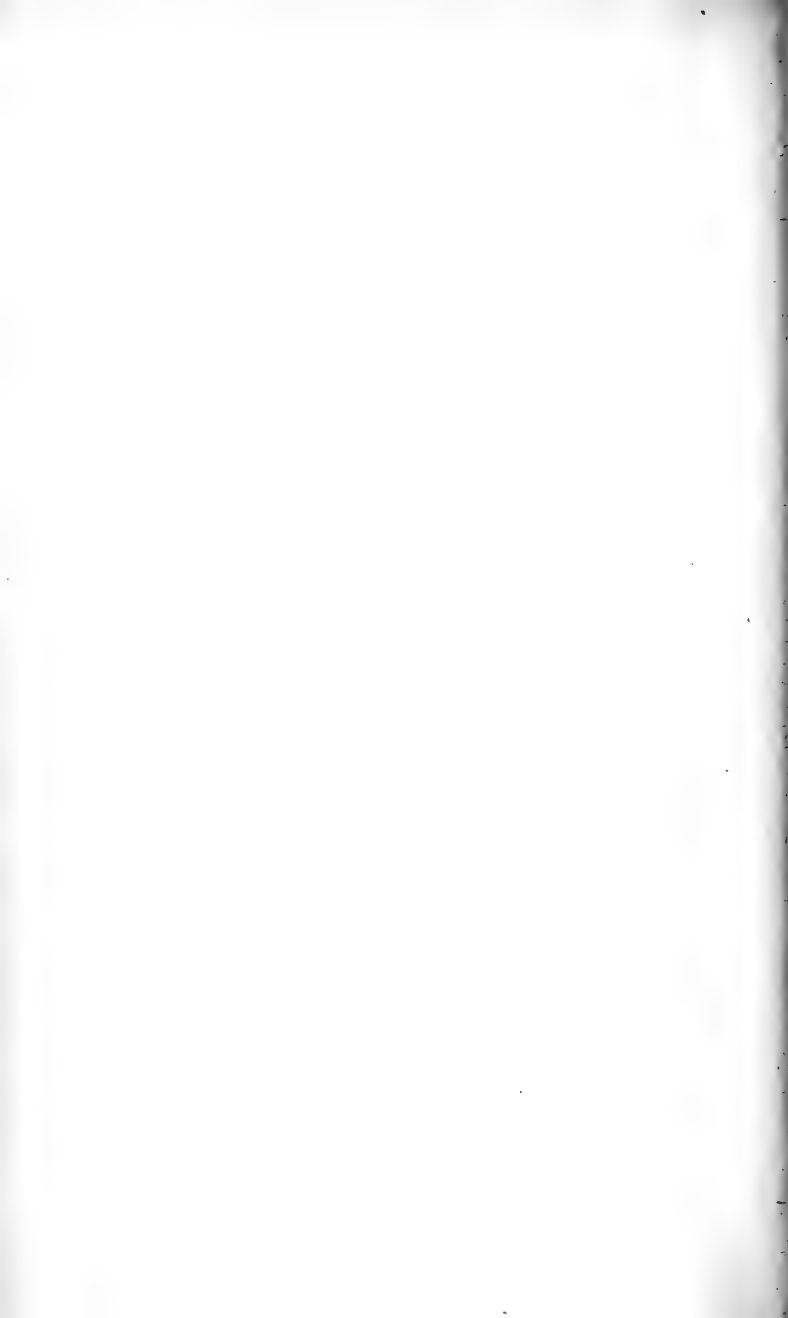
And, with this, our remarks must close. I can only assure our local observers—I wish their number might be enlarged—that any notes on Sand-grouse (or other birds), that they may care to send to me from time to time, will be welcomed, acknowledged, and utilised.

H. A. MACPHERSON.

OCTOBER 30TH, 1888.











JUN. 92

TRANSACTIONS

OF THE

Cumberland and Westmorland Association

FOR THE

*ADVANCEMENT OF LITERATURE
AND SCIENCE.*

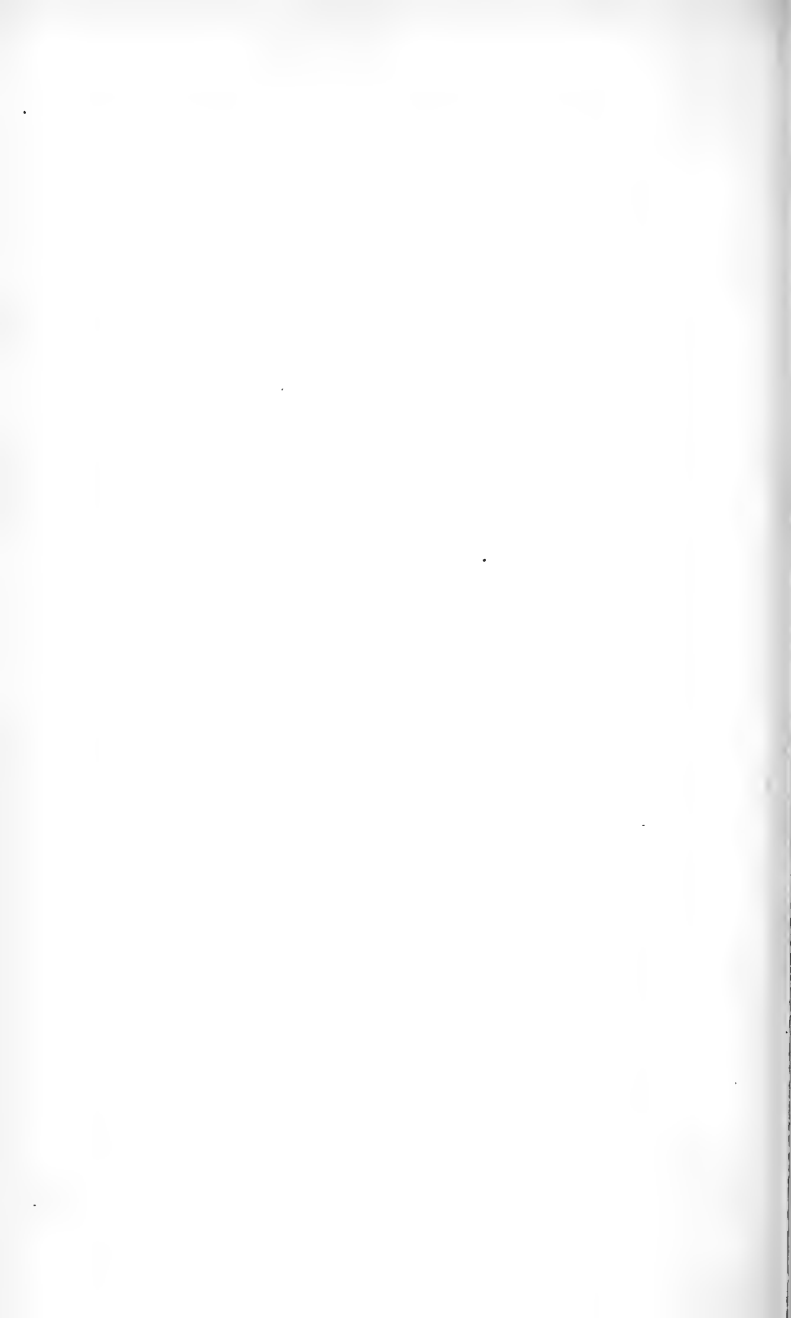
No. XIV.—1888-89.

EDITED BY J. G. GOODCHILD, F.G.S., F.Z.S.,
MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION;
H.M. GEOL. SURVEY.

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Spare copies of Nos. III., IV., and X. of the TRANSACTIONS will be gladly received by the Hon. Secretary (Mr. J. B. BAILEY, Eaglesfield Street, Maryport), and One Shilling will be allowed for each copy.

CONTENTS.

	Page
RULES	v.
LIST OF OFFICERS	viii.
ADDRESSES OF HONORARY SECRETARIES OF THE SEVERAL LOCAL SOCIETIES	ix.
MEMORANDA FOR MEMBERS	x.
LIST OF ASSOCIATION MEMBERS	xi.
REPORTS FROM THE ASSOCIATED SOCIETIES	xii.
REPORT OF ASSOCIATION SECRETARY	xxiv.
TREASURER'S ACCOUNT	xxviii.
REPORT OF SUB-COMMITTEE	xxix.
REPORT OF LIBRARY SUB-COMMITTEE	xxx.
PRESIDENT'S ADDRESS: "Weather Statistics in the Neighbourhood of Carlisle." By R. A. ALLISON, Esq., M.P. (Carlisle) ...	95
PAPERS COMMUNICATED TO THE SOCIETIES, AND SELECTED BY THE ASSOCIATION COUNCIL FOR PUBLICATION:—	
"Botanical Record for 1887-88." By WM. HODGSON, A.L.S. ...	1
"Recollections of the Keswick Post Office, Past and Present." By J. FISHER CROSTHWAITE, F.S.A. (Keswick) ...	13
"The Helm Wind." By J. G. GOODCHILD, H.M. Geol. Survey	43
"The Botany of the Solway Shore." Parts II. and III. By WM. HODGSON, A.L.S., Botanical Recorder to the Association (Carlisle and Longtown)	49
"The History of the Eden and of some Rivers adjacent." By J. G. GOODCHILD, H.M. Geol. Survey (Carlisle)	73
"Report on the Helm Wind Inquiry." By WM. MARRIOTT, F.R. Met. Soc. (Penrith)	107
"Notabilia of Old Penrith." By GEO. WATSON (Penrith) ...	127



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. Such members shall be termed “Association Members.”

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, two Secretaries, an Editor, a Librarian, and of ordinary members, two to be elected by each affiliated Society. The President, Secretaries, Editor, and Librarian shall be elected annually at the Annual Meeting, and shall be capable of re-election. The Recorders shall be ex-officio members of the Council.

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.—Association Members pay the sum of 6/- annually, or they may compound for their subscription for life by a payment of £3 3s. od. in one sum.

12.—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.

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

14.—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 Fifteenth ANNUAL MEETING will be held in the Summer of 1890, 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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Carlisle	J. SINCLAIR, Esq., 6 Hawick Street, Carlisle.
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Silloth	H. L. BARKER, Esq., Silloth.
Brampton	I. B. HODGSON, Esq., Brampton.
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MEMORANDA FOR MEMBERS, &c.

SUBSCRIPTIONS ARE DUE—

Association Members	January 1st.
For Transactions	...	...	February 1st.
Lecturer's Fee	...	...	February 1st.
Capitation Fee	...	...	April 1st.

PAPERS INTENDED FOR PUBLICATION to be sent not later than *April 20th*, to J. G. GOODCHILD, Esq., Museum of Science and Art, Edinburgh.

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Full particulars will be sent to each Society when arrangements are completed.

NOTICES RELATING TO ZOOLOGY to be sent to Rev. H. A. MACPHERSON, M.A., 20 Cecil Street, Carlisle.

NOTICES RELATING TO BOTANY to be sent to Wm. HODGSON, Esq., A.L.S., 202 Victoria Terrace, Harrington Road, Workington.

N.B.—Rev. H. A. MACPHERSON, and W. HODGSON, Esq., will gladly answer any questions through the post that Members may wish to ask, with regard to any difficulty they may meet with in their reading on Zoological and Botanical matters respectively.

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Reports from the Associated Societies.

KESWICK LITERARY AND SCIENTIFIC SOCIETY.

20TH SESSION, 1888-89.

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<i>Vice-President</i>	J. POSTLETHWAITE, F.G.S.
<i>Hon. Secretary</i> J. BROATCH
<i>Hon. Treasurer</i> T. E. HIGHTON

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Rev. J. N. HOARE, M.A., F. Hist. S.	W. WOODING NELSON
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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.

1888.

Oct. 22.—PRESIDENT'S ADDRESS—"Bimetallism."

Nov. 5.—Mr. LEICESTER COLLIER—"A Nation's Noblest Heritage."

Nov. 26.—Mr. G. E. LOWTHIAN—"Carbon and its Compounds," illustrated experimentally.

Dec. 10.—Mr. J. BROATCH—"The Folklore of Nursery Rhymes."

1889.

Jan. 28.—Mr. W. WOODING NELSON—"The Battle of Waterloo."

Feb. 25.—Rev. W. W. HAUGHTON—"A Glimpse at Hugh Lattimer and his Times."

- Mar. 4.—Mr. J. FISHER CROSTHWAITTE, F.S.A.—“Recollections of the Keswick Post Office, past and present.”
- Mar. 11.—Mr. THOS. SMITH—“Charles Mackay.”
- ANNUAL MEETING.

LECTURES.

1888.

- Oct. 29.—Mr. H. H. S. PEARSE (War Correspondent of the *Daily News* in the Soudan)—“The British Square at Abu Klea.”
- Nov. 19.—Rev. J. N. HOARE, M.A.—“The Cuneiform Inscriptions of Assyria.”
- Dec. 3.—Rev. R. WOOD, M.A.—“Some Poisonous Plants of the Lake District.”
- Dec. 17.—Mr. R. PENDLEBURY, M.A.—“Calculations.”

1889.

- Feb. 4.—Dr. BLACK—“Dr. John Brown of Edinburgh.”
- Feb. 11.—Rev. H. D. RAWNSLEY, M.A.—“Some more Royal Mummies,” with Limelight illustrations.
- Feb. 18.—Capt. ERIC STUART BRUCE, M.A.—“Electricity—the Coming Power,” illustrated by experiments.

COMMITTEE'S REPORT.—The Committee have much pleasure in reporting the progress of the Society during the past Session. The programme consisted of eight ordinary meetings and eight lectures, which may be classified as follows :—Scientific, four ; literary and biographical, five ; historical, four ; antiquarian and miscellaneous, three. The Rev. R. Wood kindly took the place of Dr. Knight, who was unable to deliver his lecture on “Food.”

The Council of the Association have been considering the desirability of having a course of University lectures in connection with the various local societies, and your Committee think that advantage should, if possible, be taken of the opportunity, as suggested by the Rev. H. D. Rawnsley in the *Crosthwaite Magazine* for January last. The Committee have arranged with the Library Committee to pay half the subscription of the library to the Cumberland and Westmorland Archæological Society, so that members may have the opportunity of perusing the valuable “Transactions” of that Society in the library. The Committee respectfully urge upon the members the absolute necessity of purchasing the *Transactions* of the Association, as by so doing they will not only benefit

themselves and add to the funds of the local Society, but will materially aid the Association. The Committee feel that the time has arrived when the Rules of the Society may be revised, and, subject to the assent of the members, purpose either by themselves or the appointment of a sub-committee, to inquire into the matter and into the position of the Museum, and to report to the members early next Session.

THE KESWICK MUSEUM OF LOCAL NATURAL HISTORY.—The Curators have to report that during the past year they completed and printed five hundred copies of the catalogue, also two hundred and fifty show cards for hotels and lodging houses, and distributed a number of the latter in the town and neighbourhood. They have further to report that they succeeded in reducing the working expenses during the tourist season by nearly two thirds, without any material loss in efficiency. The receipts were a little in advance of the previous year, notwithstanding the vigorous advertising and free exhibition of both larger and smaller competitive models of the Lake District. The following articles have been added to the collection during the year:—A “Pintail” (waterfowl) and an old English pipe, presented by R. D. Marshall, Esq. A block of Blencow Sandstone grooved by ice action, presented by Mr. John Finn. A piece of coarse volcanic ash containing a large fragment of Skiddaw Slate, presented by James Edmondson, Esq. A tinder-box and a combined rush-light holder and candlestick, presented by Mrs. Wilkinson.

TREASURER'S (SOCIETY) ACCOUNTS.—The receipts, including balance in hand, £4 15s. 2d.; members' subscriptions, £21 13s.; receipts at lectures, etc., £10 9s. 6d.; amounting to £39 2s. 5d. The expenditure includes lecturers' expenses, £10 6s. 6d.; printing and advertising, £5 11s. 5d.; rent, £4; capitation grant, £3 3s.; *Transactions*, £2 10s.; sundries, £2 14s. 6d.; leaving a balance in hand of £10 16s. 10d.

MUSEUM ACCOUNTS.—Balance in hand, £55 18s. 6d.; receipts from 737 visitors, £31 17s. 4d.; contents of box, £1 1s. 5d.; interest, 19s. 2d.; sale of catalogues, 1s.; total, £89 17s. 8d.

Expenditure—caretaker, £9; assistant curator, £5; printing catalogues, &c., £10 10s.; insurance, £1 16s.; rent, £6; sundries, £3 1s.; balance, £54 10s. 8d.

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

13TH SESSION, 1888-89.

<i>President</i>	Rev. EDWARD SAMPSON
<i>Vice-President</i> Rev. J. I. CUMMINS

Past-Presidents.

P. DE E. COLLIN		ALFRED HINE		J. B. BAILEY
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JOHN ELLWOOD		H. BUMBY
JOSEPH WATSON		F. KELLY

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<i>Hon. Treasurer</i>	C. EAGLESFIELD, junr.
<i>Hon. Secretary</i>	ERNEST W. LIGHTFOOT

The following LECTURES were given during the Session:—

1888.

Oct. 30.—CONVERSAZIONE.

Nov. 6.—W. HODGSON, Esq., A.L.S.—“Botanical Record for Cumberland and Westmorland, 1887-88.”

Nov. 20.—Rev. J. S. CRAIG.—“Fiords, Waterfalls, and Glaciers of Norway.”

Dec. 4.—Rev. C. H. GEM, B.A.—“Faith and Art.”

Dec. 11.—J. M. PAULL, Esq., F.G.S.—“Retrospective and Prospective.”

1889.

Jan. 15.—CONVERSAZIONE.

Jan. 29.—ERIC S. BRUCE, Esq., M.A.—“Natural Magic,” with numerous Experiments.

- Feb. 12.—Rev. S. HEBERT, M.A.—“Ancient and Modern Astronomy—
a Contrast.” Illustrated by Lime-Light Lantern.
Feb. 26.—H. BUMBY, Esq.—“The Cave Dwellers.” Illustrated by Diagrams.
Mar. 12.—Rev. G. PATTERSON—“John Ruskin.”
Mar. 26.—C. J. VALENTINE, Esq.—“American Notes.”
Apl. 2.—Rev. S. O. RIDLEY, M.A.—“The Deep Sea and the *Challenger*
Expedition of 1873-76.” Illustrated by Lime-Light Lantern.
Apl. 9.—ANNUAL MEETING.

Sixty-two copies of the *Transactions* have been distributed *free*
to Members.

LONGTOWN LITERARY AND SCIENTIFIC SOCIETY.

12TH SESSION, 1888-89.

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Vice-Presidents.

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Rev. P. CARRUTHERS		J. G. GOODCHILD, Esq., F.G.S.
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Mr. J. RIGG		Mr. A. TWEDDLE
Mr. A. P. WILKIE		Mr. JNO. ROBERTSON

Delegates Messrs. WILSON AND WILKIE

The following MEETINGS were held during the Session :—

1888.
Nov. 9—INAUGURAL TEA MEETING. “Selections from Shakespeare.”
Nov. 13—Mr. J. PATON—“Burns.”
Nov. 20—Debate: “Are Theatres Elevating?” *Aff.* Dr. LEIGH GILCHRIST;
Neg. Mr. JOHN WILSON.
Nov. 27—Mr. ANDERSON—“Co-Operation v. Competition.”
Dec. 4—Mr. JOHN WILSON—“Ice, and the Formation of Boulder Clay.”
Dec. 11—Mr. J. G. ELLIOT—“Paper.”
Dec. 18—Readings.

1889.

- Jan. 8—Dr. LORRAINE—"Cattle and Sheep Raising in Colorado."
 Jan. 15—Debate: "Does the Literature of the Victorian compare favourably with that of the Elizabethan Era?" *Aff.* Mr. A. P. WILKIE; *Neg.* Dr. S. F. Mc. LACHLAN.
 Jan. 22—Dr. H. LEIGH GILCHRIST—"Women."
 Jan. 29—W. E. ROBERTSON, Esq.—Paper.
 Feb. 5—ERIC S. BRUCE, Esq., M.A.—"Natural Magic," with numerous Experiments.
 Feb. 12—Rev. JOS. WALLACE, M.A.—"Man not a Machine: a responsible free agent."
 Feb. 19—Readings.
 Feb. 26—Mr. RODEN—Paper.
 Mar. 5—Rev. W. ALLAN—"Bibliomania, or Book Madness."
 Mar. 12—G. G. KIRKLINTON, Esq.—"The South Pacific."
 Mar. 19—Mr. GEO. TEASDALE—"A Night with Cowper."
 Apl. 1—Business of the Society, Election of Officers, &c.

CARLISLE SCIENTIFIC SOCIETY AND FIELD
 NATURALIST CLUB.

12TH SESSION, 1888-89.

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 Mr. R. M. HILL.
 Dr. LEDIARD.
 Mr. J. N. ROBINSON.
 Mr. F. HARRISON.

The following *MEETINGS* have been held during the Session, and the undermentioned *LECTURES* given, viz:—

1888.
 Nov. 8—R. J. BAILLIE, Esq., F. R. A. S.—“Earthquakes and Volcanoes.”
 Nov. 22—Rev. ROBERT WOOD.—“Poisonous Plants” mentioned in the
 “Lake Flora.”
 Dec. 6—Mr. HY. WILSON.—“Electricity.”
 Dec. 20—J. A. WHEATLY, Esq.—“Cameos and Intaglios.”
 1889.
 Jan. 10—Rev. H. A. MACPHERSON, M. A., M. B. O. U.—“Of Nestling Birds.”
 Jan. 24—R. A. ALLISON, Esq., M. P., President.—“Richard Mulcaster, a
 Cumberland Worthy of the days of Queen Elizabeth.”
 Feb. 7—Rev. JOHN PHELPS.—“Bees and Bee Keeping.”
 Feb. 21—ERIC STUART BRUCE, Esq., M. A. Oxon.—“Fifty years of Scientific
 Progress.”
 Mar. 7—Rev. CLAUD H. PAREZ, M. A.—“Backbones.”
 Mar. 21—Mr. POSTGATE.—“Insects.”
 Apl. 4—Rev. H. A. MACPHERSON, M. A., M. B. O. U.—“Indian Birds.”
 Apl. 18—Mr. T. T. SCOTT, Architect.—“Portland Cement—Its Manufacture
 and Uses.” &c.

During the Season Three Field Meetings have been held. About one hundred copies of the *Transactions* have been distributed gratis among the Members.

AMBLESIDE AND DISTRICT LITERARY AND SCIENTIFIC SOCIETY.

12TH SESSION, 1888-89.

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Vice-Presidents.

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Mr. E. HIRD
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Mr. STALKER, Senr.
Mr. C. W. SMITH

The following LECTURES were delivered during the Session:—

1888.
Oct. 23.—Rev. W. TUCKWELL, M.A.—“Natural History for Busy Workers.”
Oct. 30.—T. LEWIS BANKS, F.R.I.B.A., Esq.—“A few Architectural Principles, with Illustrations.”
Nov. 13.—C. A. RAYNE, Esq., M.D., Lond.—“The Brain and its relation to the Phenomena of Consciousness.”
Nov. 27.—F. BARTON, Esq., A.C.O.—“Mendelssohn.”
Dec. 11.—Rev. J. MILES MOSS, M.A.—“Old English Ballads.”
1889.
Jan. 22.—MR. JOSEPH SEVERS—“A Trip to Paris.” A Popular Lecture, illustrated.
Feb. 5.—JOHN BUTTERWORTH, Esq., F.R.M.S.—“Unwritten History.” Illustrated by Oxyhydrogen Light.
Feb. 19.—ERIC STUART BRUCE, Esq., M.A.—“Electricity—the Coming Power.”
Mch. 5.—MR. J. MARTINDALE.—“A Study in Lichens.”
April 2.—GEO. BLACK, Esq., M.D.—“Robert Burns.”
ANNUAL MEETING. Election of Officers after the Lecture.

SILLOTH AND HOLME CULTRAM LITERARY
AND SCIENTIFIC SOCIETY.

10TH SESSION, 1888-89.

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Vice-Presidents.

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W. F. WILSON, Esq., J.P.

Hon. Treasurer JOHN STRONACH.

Hon. Secretary H. L. BARKER.

The following LECTURES were given during the Session:—

1888.

Oct. 10—Rev. HILDERIC FRIEND.—“Oriental Manners and Customs.”

Nov. 28—Rev. H. A. MACPHERSON, M.A., M.B.O.U.—“The Wanderings
of Birds, and Bird Nurseries.”

Dec. 19—Dr. GABRIEL.—“Voice and Vocal Organs.”

1889.

Jan. 16—Rev. H. WHITEHEAD, Carlisle.—“Parish Registers.”

Feb. 22—ERIC STUART BRUCE, Esq., M.A. Oxon.—“Electricity—the
Coming Power.”

Mar. 6—Dr. GEORGE BLACK, M.B., Keswick.—“Physical Culture.”

Apr. 10—ANNUAL MEETING.

BRAMPTON LITERARY AND FIELD NATURALIST
SOCIETY.

SESSION 1888-89.

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Miss BELL
Miss EMMA LEE
Miss MACQUEEN
Miss THOM

The following MEETINGS were held during the Session:—

1888.

Oct. 9—OPENING MEETING.

Oct. 23—L. JONES, Esq.—“Thebes.” Illustrated by Magic Lantern.

Nov. 6—Rev. S. HEBERT—“An Evening with the Stars.” Illustrated by Magic Lantern.”

Nov. 20—Reading of Sheridan’s “Critic.”

Dec. 5—Rev. J. WILSON—“Old Carlisle Signboards.”

Dec. 18—Debate: “State Interference with Individual Liberty—How far is it Justifiable?”

1889.

Jan. 8—Rev. W. F. GILLBANKS—“Photography.”

Jan. 22—Anonymous Papers with Discussion.

Feb. 5—Rev. H. J. BULKELEY—“Eminent Men who died in 1888.”

Feb 19—W. E. ROBERTSON, Esq.—“Border Heroes.”

Mch. 5—Rev. S. FALLE—“A Peep into Holland and Dutch History.”

Mch. 19—Rev. H. WHITEHEAD—“A Walk round Brampton.”

PENRITH AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

8TH SESSION, 1888-89.

President Rev. H. WHITEHEAD, M.A.

Vice-Presidents.

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GEORGE WATSON.

Treasurer J. B. SHAWYER.

Secretary H. MCLEAN WILSON, M.B.

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C. H. GRAHAM.
E. K. KEED, M.A.
W. BELL.

The following *LECTURES* were given during the Session:—

1888.

Oct. 4—CONVERSAZIONE.

Six Special Fortnightly Lectures on “The Puritan Revolution,”
by the Rev. W. HUDSON SHAW, M.A., Oxford University
Extension Lecturer.

1889.

Jan. 3—Rev. H. WHITEHEAD, M.A.—“Parish Registers.”

Jan. 17—J. W. LOWTHER, Esq., M.P.—“The House of Commons.”

Jan. 31—Miss KUPER.—“From New York to Quebec.”

Feb. 14—J. MARRIOTT, Esq., Sec. R.M.S.—“The Helm Wind.”

Feb. 28—W. BELL, Esq.—“Lake Dwellings and Dwellers.”

Mar. 14—J. B. SHAWYER, Esq.—“The Life of Darwin.”

Mar. 28—G. WATSON, Esq.—“Notabilia of Old Penrith.”

Apl. 11—W. B. ARNISON, Esq.—“The Everlasting Hills.”

ANNUAL MEETING. Election of Officers, &c.

WINDERMERE LITERARY AND SCIENTIFIC SOCIETY.

7TH SESSION, 1888-89.

President Rev. A. RAWSON

Vice-Presidents.

CANON STOCK | Mr. B. A. IRVING

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COL. MACDOUGALL | Mr. FRANK BARTON

Treasurer Mr. JOHN HOLLAND

Delegates.

Mr. G. HEALEY. | Mr. JOHN HOLLAND

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Mr. S. ATKINSON
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Mr. J. BELL
Rev. F. BROWNSON
Mr. R. CLEGG
Mr. F. CLOWES
Mr. H. COUTTS
Mr. T. DOBSON

Mr. G. HEALEY
Mr. LONG
Mr. J. LONGTON
Mr. F. MARR
Mr. G. H. PATTINSON
Mr. A. H. RAIKES
Mr. J. ROBINSON
Mr. T. THOMPSON
Mr. W. V. YATES

The following MEETINGS were held during the Session :—

1888.

- Oct. 18—Social Meeting, with Music.
 Oct. 29—Rev. A. RAWSON—"Common Things : Air."
 Nov. 5—Rev. J. N. HOARE—"The Ancient Egyptians."
 Nov. 19—Mr. J. H. LEIGH—Dramatic Recitals.
 Nov. 29—Mr. DENISON W. ALLPORT—"The Wives of Great Men."
 Dec. 6—Conversazione.
 Dec. 17—Rev. Dr. HAYMAN—"The Armada and Contemporaneous Facts."

1889.

- Jan. 7—Prof. FRANK CLOWES, D.Sc., Principal of the University College, Nottingham—"The Land of the Midnight Sun : an Account of a Summer Cruise and Drive in Norway," illustrated by Limelight Photographic Views taken during the Trip.
 Jan. 14—Col. COOPER KING, Professor of Geology, Staff College, Sandhurst; late Professor of Tactics R.M.A.—"The Campaign of 1870-71 : Why the Germans Won."
 Jan. 28—Mr. W. V. YATES, C.M.M.C.P.—"History of the Drama before the 17th Century."
 Feb. 20—Mr. E. S. BRUCE—"Natural Magic," with Illustrations.
 Mar. 4—Mr. B. A. IRVING and CANON STOCK—Popular Lecture, with Lantern Views.
 Mar. 18—Mr. C. J. HALL, Mus. Bac.—"Music under two Queens : a Comparison and a Contrast ;" with Musical Illustrations.
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Report of Association Secretary.

THE Annual Meeting having been called somewhat earlier this year than of late, the whole of the returns have not yet been completed. Still, so far as they go, there is much reason to be satisfied with the year's work.

Compared with last year the results are as follows :—

				<i>Members.</i>		<i>Transactions taken.</i>	
				<i>1888</i>	<i>1889</i>	<i>Part XII.</i>	<i>Part XIII.</i>
KESWICK	...	...	130	130	60	50
MARYPORT	...	...	100	90	62	60
LONGTOWN	...	...	32	27	12	—
CARLISLE	...	..	122	120	105	100
AMBLESIDE	...	...	90	85	10	10
SILLOTH	...	...	50	40	7	6
BRAMPTON	...	...	79	90	12	8
PENRITH	...	...	170	202	140	140
WINDERMERE	...	...	100	104	14	6
ASSOCIATION MEMBERS	...	...	37	38	37	38
				—	—	—	—
				910	926	459	418
				—	—	—	—

MEMBERS.

Whilst regretting that there is yet no increase in the number of Societies, the Council is glad to report that the ordinary membership has been maintained, whilst there has been a slight increase in the number of Association Members. The rule passed at last Annual Meeting, by which such members might compound for their annual subscription by a Life Subscription, has worked well, and, in a large measure, accounts for the very satisfactory balance in the hands of the Treasurer. A circular sent to the various Delegates, asking their help in securing additional Association Members, met with very moderate success. Seeing that the larger this list becomes the more efficient will be the aid extended by the Association, the Council earnestly appeals to the Delegates to use their utmost endeavours in this direction during the next few months.

LECTURERS.

The arrangements made by the Council for the Public Lecturer—Eric Stuart Bruce, Esq.—were on a much more liberal scale than in previous years; and the Council trusts to be able to continue its aid on the same terms in the future. It is glad to report that Mr. Bruce, who lectured before seven of the Societies, appears to have given general satisfaction.

The best thanks of the Council are due and tendered to the Rev. R. Wood, for filling an engagement at Keswick on “short notice.”

PROGRAMMES.

The Council is fully conscious that more efficient help might be given to the Hon. Local Secs. in the compilation of their Pro-

grammes. Theoretically there is plenty of talent upon which to draw, but practically there is great difficulty in getting hold of those best able to assist. The help of the Hon. Local Secs. and the Officers and Delegates is earnestly asked towards procuring a sufficient number of Lecturers, so as to render the formation of a satisfactory Programme—especially for the smaller Societies—a matter of comparative ease.

Whilst fully aware of the arduous duties attached to the Hon. Secretaryship of a Local Society, the Council trusts that the subject of the supply of Lecturers, and Association work generally, will meet with their earnest consideration, otherwise the progress of the Association must necessarily be slow, and its power for good limited. The Council would gladly welcome any resolutions, etc., from the Local Societies or the Delegates bearing on the more efficient working of the Association.

TRANSACTIONS.

There has been a falling off in the sale of the current number of the *Transactions*, and this, for many reasons, is to be regretted. So far as Back Numbers are concerned,—although there has been a larger demand for them than usual, still much might be done to reduce the present large stock, and thus strengthen the hands of the Association. From the Statement included as part of the Balance Sheet it will be seen that, whilst there is a large stock of several of the Numbers, some three or four Numbers are practically out of print.

ORGANISATION, ETC.

Whilst unable to give as satisfactory a report as the Council

would have liked, on matters more immediately connected with the organisation, etc., of the Association, still it bears willing testimony that a considerable amount of labour has been spent towards the settlement of the questions of University Extension and British Association matters, the Circulating Library, etc.; and it is to be hoped that the time is not far distant when each will take its place in the work of the Association.

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

BALANCE SHEET FOR THE YEAR ENDING AUGUST 13, 1889

RECEIPTS.	EXPENDITURE.
Balance brought forward £0 16 7	E. S. Bruce, Esq., for 7 Lectures ... £24 0 0
Subscriptions towards Assoc. Lecturer's Expenses ... 13 2 6	Editor's Postage Account... 0 10 0
Capitation on 824 Members 19 19 0	Hon. Sec.'s do. ... 2 4 2
Subscriptions of 6 Life Memb. 18 18 0	„ Carriage A/c. 0 10 10
Do. of 28 Assoc. Members 8 13 0	Griffin's Year Book ... 0 6 0
<i>Transactions, Part XIII.*</i>	R. Adair—Post Cards and Printing ... 0 7 6
To Local Societies (300) 15 0 0	Messrs. Coward—Printing 720 copies Part XIII. 23 5 0
Back Numbers ... 3 14 7	Do. Doing up 700 ... 3 5 0
Authors' Copies ... 2 9 9	Do. Authors' Copies ... 4 0 8
Arrears— <i>Transactions</i> Pt. XII 3 2 0	Do. Pasting in 700 Views of Ormathwaite ... 0 3 0
„ Capitation, 1887-88 13 Members ... 0 6 6	Do. for Stationery, &c. ... 1 1 9
Bank Interest ... 0 3 8	Do. Expenses Annual Meeting (1888) ... 2 2 10
	Do. Carriage ... 0 1 10
	Messrs. Steel, Advertisement (Meeting, 1889) ... 0 4 6
	Hon. Sec. for Back Numbers 1 11 0
	Balance in hand ... 22 11 6
£86 5 7	£86 5 7

* Receipts for copies *Transactions* to 38 Association Members are included in their Subscriptions.

Examined and compared with Vouchers and found correct,

August 16th, 1889. H. BUMBY,
R. H. HAMILTON, } Auditors.

ASSETS.	LIABILITIES.
Balance in hand ... £22 11 6	
Arrears—64 Members ... 1 12 0	
Do. Association Members 1 4 0	
Do. 60 <i>Transactions</i> Pt. XIII. 3 0 0	(Nil.)
Do. Authors' copies ... 1 1 8	
£29 9 2	

The following is the stock of Back Numbers of the *Transactions* on hand September 13th, 1889:—

Parts	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.
	69	71	7	3	98	229	250	224	238	37	169	173	256

TRANSACTIONS, PART XIII.

Sold to Societies	360
Sold to Association Members	38
Sold to Non-Members	2
Presented	44
On hand September 13th, 1889	256
	700

REPORT OF SUB-COMMITTEE (ABSTRACT).

IN submitting its Report on the various points named on p. xxviii. of Part XIII. of the *Transactions*, the Sub-Committee regrets to say that, under present conditions, united action this Session in the matter of University Extension is an impossibility. Such, however, was the character of the replies received in answer to their enquiries, that they have every confidence that another Session success may be possible. They would recommend the Council to make a grant to Local Associations which choose the Extension Lectures in preference to the Association Lecturer.

With regard to the "formation of classes," they think that the Council should foster the growth of classes in Natural Science, especially if in connection with the Science and Art Department, South Kensington. If this could be done, they think it might prove a very useful auxiliary to the University Extension scheme. They would recommend that a prize, or prizes, be awarded to the most successful student or students attending such classes.

With regard to systematic work in connection with the syllabus of the British Association (see p. xxxiv. *Transactions*, Part VIII.) the Sub-Committee would suggest:—

(1) The appointment of Recorders in other subjects in addition to Zoology and Botany, as at present.

(2) That all such Recorders be asked if they would correspond with *members* on any difficulty they might meet with in the course of their study of such subject or subjects.

(3) That each Local Society should appoint a permanent Sub-Committee, whose office should be to register such facts and phenomena as might come under their notice, and the record of which might be valuable. Such Sub-Committee might act under the direction and supervision of the Recorders, and the results of their observations be reported in the *Transactions*, under "Notes and Memoranda."

REPORT OF LIBRARY SUB-COMMITTEE.

THE Rules, etc., have been drawn up, and the Rev. M. Sidney Donald is engaged in drawing up a Catalogue. The Books will be kept at the Museum, Carlisle, and will be ready for issue before next Session. Full particulars will be supplied to the Local Hon. Secretaries so soon as the Catalogue is completed.

BOTANICAL RECORD FOR 1887-88.

By WM. HODGSON, A.L.S.

EVER since my appointment to the post of Botanical Recorder to the Association, conjointly with the Rev. R. Wood of Rosley, I have collected information bearing on the Botany of Cumberland and Westmorland, with a view to the publication of a Flora of the county. The manuscript has been examined and approved by Mr. J. G. Baker, F.R.S., F.L.S., of Kew. I am largely indebted to Mr. Baker for many valuable suggestions, as well as for the free use of his own reports on the Alston and Gilsland neighbourhoods. The following local gentlemen have also courteously lent me all the aid in their power, viz: Mr. W. Duckworth, late of Carlisle; Mr. Jos. Adair of Egremont; Mr. J. C. Smith of Nandana, Penrith; the veteran Wilson Robinson of Whinfall Hall, Cockermouth; Mr. R. H. Hamilton of Maryport; Dr. Leitch of Silloth; Mr. T. Lister of Flimby, &c.

I am still open to receive further notice of localities for species other than the commonest forms of plant life, that may be found in Cumberland; particularly from Longtown district, and the extreme north of the county. Mr. Baker wrote to me on June 26th of the present year (1888): "I have studied your Flora with much interest. It is a great advance to have all the Cumberland records codified in this way, and so many new ones added. I hope Mr. J. A. Martindale of Staveley will do for Westmorland what you are doing for Cumberland; and that Mr. J. C. Melville will re-work Furness for his projected Flora of Lancashire."

Last summer it came to my knowledge that a son of Mr. Todd of Mereside, Bromfield, had made a collection of local plants, for which—beautifully dried and mounted—he had received the principal award at the Agricultural College, Aspatria. Being in Mr. Todd's neighbourhood shortly afterwards, I called to see this collection, and was agreeably surprised to find that he had gathered two plants which I had never seen in a growing state, and for which hardly any previous County records existed.

I will now enumerate the new records established within the two last seasons, keeping to the order and nomenclature of the London Catalogue of British Plants, 7th edition (1877).

RANUNCULACEÆ.

- 9 *Adonis autumnalis*. A waif, found growing plentifully in a flax crop at Woodside farm, over Flimby.
- 11 *Ranunculus aquatilis*, var. (a) *drouettii*. Found in 1887 in a tributary of the R. Cocker, between Scalehill and Lorton.
- 23 *R. sceleratus*. Near the Chemical Manure Works, Silloth. (Rev. H. Friend.)

PAPAVERACEÆ.

- 42 *Papaver rhæas*. This plant, common enough in my boyhood, is gradually dying out with the abandonment of tillage for cereal crops. Rubbish heaps at Risehow, Maryport.

CRUCIFERÆ.

- 58 *Coronopus ruellii*. Stray plants found in each of the last three summers on the ballast hills, Maryport.
- 60 *Thlaspi arvense*. Hardly recognised as indigenous here, but found at Risehow, Maryport, and on the L. & N. W. Railway, near St. Helen's signal box.
- 65 *Teesdalia nudicaulis*. Near Brackenthwaite, in Loweswater, 1887.
- 68 *Lepidium draba*. Near Risehow, on rubbish, 1887.
- 71 *L. ruderale*. Ballast heaps at Maryport, 1887.

- 97 *Barbarea præcox*. Behind the Lonsdale Dock on Workington North Shore, 1887-88.
- 124 *Raphanus maritimus*. Growing luxuriantly on the North Shore, Workington, 1887-88.

VIOLACEÆ.

- 134 *Viola hirta*. Flowering beautifully in the spring of the present year (1888) at Broughton Crags, Cockermouth, on limestone.
- 136 *V. lutea*. Abundant on the south side of the highway between Loweswater and Lamplugh, 1888.

DROSERACEÆ.

- 139 *Drosera intermedia*. Turfy moss, Nethertown, near Saint Bees, 1887. (Mr. Jos. Adair.)

CARYOPHYLLACEÆ.

- 146 *Dianthus armeria*. Hedgebank at Mereside, Bromfield. (Master Jos. Todd.)
- 171 *Sagina nodosa*. Found in some plenty on peat moss at Salta, near Dubmill, 1887.
- 180 *Arenaria verna*. Everywhere common about the lead mines, from an elevation of five hundred yards over Garrigill and Nenthead to Lower Nent Force. (J. G. Baker.)
- 184 *Stellaria nemorum*. Ravine of the Ive, under Highhead Castle, near "Carlin-pot," 1888. Wood near Dearham Bridge, 1887. Skiprigg Wood, near Raughton Head, 1888.
- 194 *Cerastium semidecandrum*. Hillocks near Bankend, Maryport, on the beach; also between Flimby and St. Helens.
- 194* *C. tetrandrum*. Under the retaining wall of the railway abutting on the beach at Flimby, abundant.

MALVACEÆ.

- 206 *Malva rotundifolia*. Specimens seen near the mill race below the Forge at Dalston, 1887; also seen near Lazonby by Mr. J. C. Smith, and in the neighbourhood of Silloth by Rev. R. Wood.

HYPERICACEÆ.

- 223 *Hypericum elodes*. Lady Moss, Nethertown; Braystones Tarn, &c. (Mr. Jos. Adair.)

GERANIACEÆ.

- 232 *Geranium pyrenaicum*. Appended to the station assigned to this plant, viz. Yeorton Hall, near Beckermeth, in Mr. Baker's Flora of the Lake District, is the note, "requires confirmation." A specimen sent to me by Mr. Adair was forwarded to Kew, and admitted by Mr. Baker to be "the true thing."

BALSAMINACEÆ.

- Impatiens parviflora*. A plant sent to me along with the preceding, and which was gathered in a garden at Millholme, near Bootle, has been identified as *I. parviflora*, naturalised in some parts of the kingdom, and stated by Mr. Baker to be a troublesome weed in the gardens at Kew.

LEGUMINIFERÆ.

- 255 *Ononis spinosa*. It was for some time in doubt whether genuine *spinosa* could be claimed as a Cumberland plant. It has, however, been recently reported from Rockcliffe and the neighbourhood, both by Mr. Duckworth and Mr. Friend. Mr. R. H. Hamilton of Maryport shows specimens from Dovenby; and Mr. T. Lister, a neighbour of mine, introduced me to the plant at Broughton Crags, near Cocker-mouth. I have also seen it growing in Rosegill, over the R. Ellen, about three miles from Maryport. These last stations are all on limestone, which *O. spinosa* seems to prefer.

- 262 *Medicago denticulata*. This plant appeared in the summer of 1887 at the edge of a dunghill at St. Helen's Colliery, Workington. One of the officials accounted for its presence by supposing that the seeds came among Irish hay imported for the use of the horses at the colliery. He was probably right.
- 264 *Melilotus officinalis*. Grows at intervals along the beach between Workington and Maryport. On the ballast heaps at the latter place the var. *parviflora* grew plentifully in 1886-87.
- 265 *M. vulgaris*. Remarkable for its sweet scent and *white* blossoms, characters which readily distinguish it from the preceding plant, which bears *yellow* flowers; with the preceding at Maryport.
- 271 *Linum angustifolium*. Howrigg quarry, near Curthwaite. (Rev. R. Wood.)
- 310 *Lathyrus sylvestris*. Formerly supposed to grow only on Redness Point, near Parton. It now flourishes abundantly on the L. & N. W. Railway slopes a little to the east of Siddick Junction.

ROSACEÆ.

- 353 *Rosa arvensis*. Grows in some abundance in the upper portions of Flimby Wood, and yet more plentifully in Aigle Gill Wood, about a mile further to the west.

CRASSULACEÆ.

- 418 *Cotyledon umbilicus*. Ehen side, Egremont. (Mr. Jos. Adair.)

UMBELLIFERÆ.

- 479 *Silaus pratensis* is the only new species of this extensive order I have to note. Prevalent on the high moors of Ellenborough, Broughton, and Seaton.

DIPSACEÆ.

- 539 *Dipsacus sylvestris*. A few weeks ago I was fortunate enough to discover a large mass of these plants growing at the

bottom of an abandoned limestone quarry at Brigham, near Cockermouth. They must have numbered several hundreds altogether, and many of their stems measured over seven-and-a-half feet in height. The finest specimens grow by the edge of pools, which here and there fill up the inequalities of surface left by the workmen.

COMPOSITÆ.

- 584 *Hieracium umbellatum*. Found growing on the railway slopes, close to Siddick Junction, 1887-88.
- 591 *Cichorium intybus*. A solitary specimen found growing within a few feet of the Senhouse Dock at Maryport; clearly adventive, and probably a remnant of corn cargoes discharged there.
- 607 *Carduus heterophyllus*. Reported to me by Mr. R. H. Hamilton as growing in a railway cutting near the private station at Dovenby, where I have since seen it. Lyne-side, near the foot of Solport Burn, 1887.
- 613 *Centaurea scabiosa*. Seen in the quarry at Brigham just referred to, and since reported by Mr. T. Lister of Flimby from the neighbourhood of Bertha Pit, Great Broughton, Park Head, Sebergham, 1887.
- 630 *Gnaphalium sylvaticum*. Found near Mereside, Bromfield, by Master Jos. Todd, 1887; and quite lately shown to me near Woodside farm, Flimby, by Mr. T. Lister.
- 647 *Senecio erucifolius*. Reported formerly from Little Broughton by Wilson Robinson, and since seen by Mr. Lister and myself spreading over an extensive area about Broughton Crag.
- 669 *Anthemis cotula*. On the Maryport ballast heaps for three consecutive seasons. A large patch seen on the gravel close to the Senhouse Dock.

CAMPANULACEÆ.

- 679 *Campanula rapunculoïdes*. Shown to me at Ivegill vicarage by Mrs. Phillips a few weeks ago. She reported it as

not uncommon in her neighbourhood. I have only seen it in places where it was palpably a garden escape or relic of cultivation. Gatesgill, Oughterside, Flimby, &c.

ERICACEÆ.

- 699 *Andromeda polifolia*. Seen in abundance on the northern moors, as Scaleby Moss, Bolton Fell, &c. 1887.

SCROPHULARIACEÆ.

- 780 *Antirrhinum orontium*. Seen as a garden weed near the Flimby Post Office, 1887.

VERBENACEÆ.

- 798 *Verbena officinalis*. A single plant seen on a rubbish heap behind the iron furnaces at Maryport, 1887.

LAMIACEÆ.

- 812 *Calamintha acinos*. Gathered on a bank near High Lorton, and shown to me by Miss G. Musgrave, 1887.
- 826 *Leonurus cardiaca*. Mr. Wood of Rosley regrets to report the disappearance of this plant from a previously known station in his parish. It was pointed out to me by Mr. Friend lately in a cottage garden near Flimby, where it is associated with Wormwood, Chamomile, Horehound, Comfrey, &c. Mr. Friend has also seen the plant not far from Carlisle.
- 835 *Galeopsis versicolor*. Beautiful specimens of this species sprang up on a newly-formed railway embankment near Seaton Station in 1887.
- 865 *Asperugo procumbens*. During the summers of 1886 and 1887 a few specimens of this rare plant were noticed among other *waifs* on the ballast at Maryport. No traces of it now remain, the place being covered with fresh layers of ballast.

PLUMBAGINACEÆ.

- 899 *Statice binervosa*. Specimens of this plant were received in 1887 from Mr. Jos. Adair. They were gathered about the base of the cliffs at St. Bees Head, an old station for the species.

CHENOPODIACEÆ.

I have experienced no slight difficulty in the correct identification of the various types of Goosefoot and *Orache* that have appeared by thousands on the heaps of household rubbish and ships'-ballast deposited about Risehow and Maryport during the last five years, in addition to those species which are recognised as indigenous to the Solway shore. My doubts have been resolved in most instances by the ready courtesy of Mr. Baker.

Of Chenopods proper, besides the ordinary *Chenopodium album* and its variety (b) *viride*, I have gathered *C. urbicum* and *C. murale*, but in consequence of the frequent changes of surface by fresh additions of ballast, I cannot look upon them as likely to maintain their footing or to become persistent.

Of the Orache or Purslane family the following have been observed, viz. *Atriplex laciniata*, distinctly I think indigenous, being met with frequently along the beach; *A. hastata*, with two or three varieties; *A. babingtonii*, *A. angustifolia*, *A. littoralis* of several types; *A. deltoidea*, also in variety.

- 925 *Beta maritima*. Plentifully distributed over the ballast heaps nearest to the head of the Senhouse Dock since 1876. It is, however, indigenous to the coast, having been observed at several stations from Coulderton to Harrington, though never very numerous.

EUPHORBIACEÆ.

- 977 *Mercurialis annua*. A plant heretofore but little known in Cumberland, has been found on the ballast hills in 1886 and 1887. Adventive doubtless.

ORCHIDACEÆ.

- 1042 *Cephalanthera ensifolia*. Reported to me last year from Clifton House, Workington, by Mr. Geo. Coggins.
- 1051 *Orchis pyramidalis*. Reported like the preceding from the same station, also by Mr. Coggins.
- 1048 *O. ustulata*. This diminutive but handsome orchid has been gathered in the meadows at Edenhall, by Mr. J. C. Smith, who reports it as plentiful there.

MELANTHIACEÆ.

- 1105 *Colchicum autumnale*. I note here with pleasure a remarkable find of this rare species by Mr. J. C. Smith, who reports its occurrence in considerable abundance in a meadow on the R. Eamont, below the village of Tyrril, in Westmorland. I hope to hear more about it.

POTAMACEÆ.

- 1136 *Zannichellia palustris*. Seen lately in Broughton Beck, close to Papcastle Station.

TYPHACEÆ.

- 1144 *Sparganium minimum*. Reported from Cliburn Moss in Westmorland by Mr. J. C. Smith, who saw it associated with *Utricularia minor*. I recollect seeing the latter plant at the same station in 1883, but not in flower at the time of my visit. Cliburn Moss resembles in many of its features the famous moss at Newton Reigny, near Penrith. In the Old Reservoir, Maryport, 1888.

JUNCACEÆ.

- 1160 *Juncus compressus*, (b) *gerardi*. On the Cloffocks at Workington, with *Glaux maritima*. Reported also from Seascale by Mr. J. Adair, 1887.

CYPERACÆ.

- 1180 *Rhynchospora alba*. Seen abundantly on Scaleby Moss, Bolton Fell, and the northern moors generally, 1887.

- 1190 *Scirpus maritimus*. Specimens were forwarded to me in 1887 by Mr. J. Adair, which were gathered on the shore near Ravensglass.
- 1222 *Carex vulpina*. Discovered last month in swampy ground in Flimby Wood, not far from the Robin Hood Pit. Only once before seen at the mouth of a stream at Saint Bees.
- 1248 *C. pendula*. In July of last year I found this fine sedge growing luxuriantly in the Lyneside Woods, on the right bank of the river, under Shanks Castle. In 1824, Mr. N. J. Winch, an able Newcastle botanist, in "Contributions towards a Cumberland Flora," speaks of this as common in our woods. This statement being at variance with my own experience, I would gladly know from those familiar with the Longtown district, and the Netherby Woods in particular, whether the Great Sedge abounds or not in this quarter of the county.

GRAMINÆ.

Having treated at length of the Grasses at the Workington Annual Meeting in 1882, I can here only briefly refer to the few species recently discovered, or indicate new stations for Grasses of comparative rarity.

- 1267 *Setaria viridis*. Two or three examples seen on a rubbish heap behind the "slag" banks at the Maryport iron furnaces in 1887.
- 1282 *Alopecurus agrestis*. On the Maryport ballast in 1886-87. Not seen this year. Its presence with us is undesirable. Under the name of "Black Bent" it is a great pest to agriculturists in the Midland counties.
- 1287 *Milium effusum*. In July, 1888, discovered in a gill by the Ive, under Highead Castle, close to "Carlin Pot." Reported also by Mr. Friend from Orton Moss, near Carlisle.

- 1288 *Apera spica-venti*. Maryport ballast in 1886-87. Since disappeared.
- 1354 *Bromus secalinus*. Plentiful on the ballast along with the preceding.
- 1368 *Hordeum murinum*. Rubbish heaps at the north end of the Maryport "slag" banks, 1887-88.
- 1369 *H. maritimum*. Specimens from Silloth of this year's growth shown to me by Mr. Friend.

FILICES.

A few new stations for Ferns of comparative rarity have been kindly communicated to me; but in view of the wholesale destruction of these interesting plants, I refrain from making them public.



RECOLLECTIONS OF THE KESWICK POST OFFICE,
PAST AND PRESENT.

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

At the General Post Office there is no record of any Post Office at Keswick previous to the year 1789. In that year the name of Mary Southward appears as postmistress, and the salary is stated as £23 a year, with an allowance of £158 5s. for riding work.

Mrs. Southward was the widow of Mr. Southward, landlord of the Royal Oak inn; and from notices in an old diary which I possess, it appears that her husband had been postmaster before her, and she was appointed on his decease.

The riding work was done on horseback, and it would be from Keswick to Penrith, and Penrith to Keswick.

The parish register shows that Mrs. Southward was married April 4th, 1790, by licence, to Mr. John I'Anson, by Isaac Denton, vicar, the witnesses being Mark Mayson and John Tyndall.

In 1791 John I'Anson appears as postmaster, with a salary of £10 a year, and an allowance for riding work of £158 5s. The salary was raised to £15 in 1794.

A Bye Letter Office was established in the year 1799, and the salary is stated as £14. For the Bye Letter Office £10; and the allowance for riding work was raised to £167 7s. 4d. There was no further alteration in the salary during Mr. I'Anson's service, which terminated in January, 1808, on his resignation.

Before Mr. and Mrs. I'Anson's retirement, they built and went to reside at Acorn House, she giving it that suitable name because

it was the outcome of her residence at the "Oak," as the inn was always called in those days.

Governor Stephenson's parents had sent their son out to India from the Royal Oak, and he returned after a successful and useful career to his native place, where he built Governor's House on the site now occupied by Dr. Ring's house.

Mr. and Mrs. I'Anson also sent out a son, in the hope that he might have equal success; but a tombstone in Crosthwaite churchyard records that "John I'Anson, a Lieutenant in the 11th Regiment of Native Infantry, died at Tinnevely, in the East Indies, September 12th, 1812, in the 22nd year of his age. By his Regiment universally beloved and deeply lamented."

The year before Mr. I'Anson retired, the riding work was raised to £291 2s. 4d., and the salary of Mr. I'Anson at the time of his retirement was £24.

In 1808 Mr. James Atkinson was appointed, and the salary appears as £46, and the allowance for riding work £225 4s. od. There was no further alteration until 1841, when the salary was reduced to £40, and an allowance of £20 a year was granted for assistance; and at this it continued until February, 1846, when Mr. Atkinson resigned.

Mr. James Atkinson was a Keswick man, and he had received a superior education. He had gone to Penrith to be clerk to Mr. Buchannan, the postmaster and keeper of the George Hotel at that place. He mentioned that as soon as the letters were ready for delivery, he used to go into the Square in front of the George, and blow a horn to apprise the townspeople.

Mr. Atkinson married the widow of Mr. Daniel Duglison, a woollen manufacturer who died young, and she carried on the business single-handed for some time with success, after her first husband's decease. She was the mother of Professor Robley Duglison, M.D., of Jefferson College, Philadelphia, U.S., whose medical works have a world-wide circulation and reputation. After thirty-six years absence in America, Dr. Robley Duglison paid a visit to his mother at her residence in Keswick, where he was brought up. Many present will remember his genial conversation

with the friends of his youth. He presented his "Medical Dictionary" in two vols. to the Keswick Library.

The riding work was done by men or boys on horseback, and the letter bags were conveyed in saddlebags. We remember hearing of John, Ben, and Will Brockbank performing this duty for years in Mr. I'Anson's time. The postman blew a horn to announce his approach, and this official is well described by the poet Cowper in *The Task*, Book 4, "The Winter Evening."

"Hark ! 'tis the twanging horn o'er yonder bridge,
That with its wearisome but needful length
Bestrides the wintry flood, in which the moon
Sees her unwrinkled face reflected bright ;—
He comes, the herald of a noisy world,
With spattered boots, strapped waist, and frozen locks ;
News from all nations lumbering on his back.
True to his charge, the close-packed load behind,
Yet careless what he brings, his one concern
Is to conduct it to the destined inn ;
And, having dropped the expected bag, pass on.
He whistles as he goes, light-hearted wretch,
Cold and yet cheerful : messenger of grief
Perhaps to thousands, and of joy to some ;
To him indifferent whether grief or joy.
Houses in ashes, and the fall of stocks,
Births, deaths, and marriages, epistles wet
With tears, that trickled down the writer's cheeks
Fast as the periods from his fluent quill,
Or charged with am'rous sighs of absent swains,
Or nymphs responsive, equally affect
His horse and him, unconscious of them all."

Tradition still points to a plantation near Dacre road end, on the Penrith ride, where the postman was dismounted by footpads and tied to a tree, while the robbers emptied the postbag in bootless search for booty, then decamped and left the poor wretch in the cold night till he was delivered by the first passer by in the morning. My predecessor once told me, that when he first took the office, he could have put all the letters which came to Keswick into his breeches pocket ; and we may be sure that of bank notes or gold there would be none.

The remark about breeches pocket reminds me of a story of

President Lincoln, that grand American, who was once postmaster of a small place, and not as Benjamin Franklin was, postmaster general. Holland in his admirable life of Lincoln says: "About this time Mr. Lincoln was appointed postmaster by President Jackson. The office was too insignificant to be considered politically; and it was given to the young man because everybody liked him, and because he was the only man willing to make out the returns. He was exceedingly pleased with the appointment, because it gave him a chance to read every newspaper that was taken in the vicinity. He had never been able to get half the newspapers he wanted before, and the office gave him the prospect of a continual feast. Not wishing to be tied to the office, as it gave him no revenue that would reward him for the confinement, *he made a post office of his hat.* Whenever he went out, the letters were placed in his hat. When an anxious looker for a letter found the postmaster, he found his office; and the public officer, taking off his hat, looked over his mail wherever the public might find him. He kept the office until it was discontinued or removed to Petersburg."

I mentioned just now that in the year 1799 Keswick was established as a Bye Letter office. I was puzzled to know what this meant. I applied to the editor of the *Blackfriars Magazine* for information, which he obligingly supplied, as follows. (I may here inform you that the "Blackfriars" is an admirably conducted monthly magazine, published by officers of the General Post Office, and having the sanction of the Secretary.) Mr. H. J. Green said; "A *bye letter* office was a kind of sub-office that had no direct communication with head quarters. Originally all the post towns (which were, of course, comparatively few in number) were on the main roads, and any small town that lay *off* the main road, and which from its position would be a good means of communication between two post-towns, would be called a *bye letter* office."

From this I gather that previous to 1799 Keswick received all its correspondence from the Penrith office only, and that all letters were sent to that office. But when it was established as a Bye Letter

office, it became a connecting link between Penrith, Cockermouth, Workington, and Whitehaven.

Perhaps this development of the service will be better understood by the following quotations from Mr. Lewens' book, *Her Majesty's Mails*, for which I am also indebted to Mr. Green.

"The principal deputy postmasters are empowered to erect *cross-posts* or stages, so that all parts of the country may have equal advantages as far as practicable, etc.

"Up to 1720 the lines of post had branched off, from London and Edinburgh respectively, on to the principal roads of the two kingdoms; but the 'cross-posts,' even when established, had not been efficient, the towns off the main line of road not being well served, whilst some districts had no direct communication through them.

"Ralph Allen, who became postmaster of Bath, developed the cross-post system largely. By his representations, he induced the Lords of the Treasury to grant him a lease of the cross-posts for life. His engagements were to bear all the cost of his new service, and pay a fixed rental of £6,000 a year, on which terms he was to retain all the surplus revenue.

"In 1764, the cross-posts had extended to all parts of the country.

"Towards the last, the private project had become so gigantic as to be nearly unmanageable, and it was with something like satisfaction that the Post Office authorities saw it lapse to the crown. At this time it was considered one of the chief duties of the surveyors—whose business it was to visit each deputy postmaster in the course of the year—to see that the distinction between the *bye letters* of the cross-post, the postage of which belonged to Mr. Allen, and the postage of the general post letters, which belonged to the Government, was properly kept up.

"On the death of Allen, the cross-posts were brought under the control of the Postmaster General. An officer, Mr. Ward, was appointed to take the *Bye Letter Office*, as the branch was now called, at the salary of £300 a year. The success of the amalgamation was so complete that at the end of the first year, profits to the amount of £20,000 were handed over to the Crown. Afterwards, the proceeds continued to increase even still more rapidly, so much so, that when in 1799 the *Bye Letter Office* was abolished, and its management transferred to the General Office, they had reached the enormous yearly sum of £200,000!

In July, 1802, there arrived at the Queen's Head, Keswick, in a handsome well-appointed travelling carriage, but without any servant, a stylish person who assumed the name of The Honourable Alexander Augustus Hope, brother of the Earl of Hopetoun,

and Member for Linglithgow. His real name was John Hatfield. He was born in the year 1759, of humble parentage, in Cheshire, but possessing great natural abilities. His face was handsome, his person genteel, and his complexion fair. In his boyhood he showed an evil disposition, and he quitted his family and became a rider to a linen-draper in the north of England.

In the course of his journeys he discovered that a young person, the natural daughter of a nobleman, was to have a fortune of £1,000 if she married with her father's approbation. He courted the unsuspecting girl, and told her foster parents that he would on no account marry the young woman if her relations were not satisfied with their union. This seemed so honourable to the unsuspecting nobleman, that after seeing the man he consented, and the day after the marriage he presented Hatfield with a draft on his banker for £1,500. This took place in 1771 or 1772.

He now went off into the fashionable parts of London, and soon dissipated the money, and left his wife with three daughters to depend on the charity of her relations. Wherever he went he vaunted his parks and his hounds, and earned for himself the appellation of "the lying Hatfield."

He next got into the King's Bench prison for a debt of £160, and he had the impudence to induce a clergyman who visited the prison to ask the head of the house of his wife's father to pay off this debt,—which he did out of pure benevolence on the bare statement that he was a poor unfortunate member of the same family.

In 1792 he was again thrown into prison for debt, when a Miss Nation, of Devonshire, to whom he had become known, paid his debts, took him from prison, and married him.

Soon after he was liberated, he prevailed upon some highly respectable merchants in Devonshire to take him into partnership with them; and with a clergyman to accept his drafts to a large amount. Upon this he made a splendid appearance in London, and, before the general election, even proceeded to canvas the borough of Queensborough. Suspicions now arose. He was declared bankrupt in order to unmask him. He then left his

second wife with two children at Tiverton, borrowed the handsome carriage of a Mr. Prinsep of that place, and arrived as before stated in July, 1802, at the Queen's Head inn, Keswick. From Keswick he made excursions among the neighbouring valleys, meeting with great attention on account of his handsome equipage, and still more from his visiting cards, which designated him "The Honourable Alexander Augustus Hope." He received letters under this assumed name, and he occasionally *franked* letters by that name. Now, *that* being a capital offence, being not only a forgery, but (as a forgery on the Post Office) sure to be prosecuted, nobody presumed to question his pretensions any longer, and he went to all places with the consideration attached to an Earl's brother.

In an evil hour he went to the Fish inn, Buttermere, kept by Mr. and Mrs. Robinson, aged people, who had an only daughter Mary, eighteen years of age, and paid his addresses to her.

He now became acquainted with an Irish gentleman in Keswick who had been resident there with his family for some months. He was a member of the then Irish Parliament. There was likewise a young lady of fortune and great personal attractions in his charge. He took with him an army list, and pointed to his assumed name, the Honble. Alexander Augustus Hope, lieutenant colonel of the 14th regiment of foot. This acquaintance grew rapidly. He paid his addresses to the young lady, and obtained her consent. The wedding clothes were bought; but previous to the wedding-day being fixed, she insisted that the pretended Colonel Hope should introduce the subject formally to her friends. He now pretended to write letters and await answers, and proposed to take a trip to the Earl of Hopetoun's seat.

From this time he played a double part; his visits to Keswick became frequent, and his suit to the young lady most assiduous. Still, both at Keswick and Buttermere, he was shy of appearing in public. He was sure to be engaged on a fishing expedition when any company was expected at Buttermere; and he never attended the church at Keswick but once. He was twice at the museum, Keswick, and conversed with my late father for an hour each time,

but he could not induce him to put his name in the visitors' book. He put it off by saying, "My name is Ready Money."

Finding his scheme to gain the young lady and her fortune a failure, he induced Mary of Buttermere to give her hand in marriage. He, in company with a clergyman, procured a licence, and they were publicly married at Lorton church on Saturday, the 2nd October, 1802. A romantic account appeared in the newspapers. This fell under the notice of several persons in Scotland who knew that the real Colonel Hope had been abroad all the summer, and was then residing at Vienna.

After the marriage he took his young wife to Longtown, where he only stayed three days, and then returned to Buttermere.

There happened at this time to be Mr. Harding, a barrister, and a Welsh judge passing through Keswick, who heard of the impostor. He sent a note by his servant, who at once said, "I brought this for Colonel Hope, but you are not the gentleman." Hatfield observed that it was a mistake, and that it was for a brother of his. However, he sent for four horses, and came over to Keswick. He had already drawn a draft for £30, by permission, on a Mr. Crumpton of Liverpool, and he now drew another for £20, which the landlord of the Queen's Head foolishly cashed. He made a blank denial that he had ever assumed the name of Colonel Hope, but that his name was Hope, but not M.P. for Linlithgow.

Mr. John Sander, a most respectable person, was town constable for the year, and he was requested to take Hatfield into custody. When charged, he said, "Show me your authority, and a thread shall hold me." It was then arranged that a warrant should be obtained from the nearest magistrate, who was Sir Frederick F. Vane, bart. Hatfield said, "I will get my old boatman and have a row upon the lake until the warrant arrives." His boatman was old *Neddy Birkett, who took him to the head of the lake, when Hatfield decamped, and made his way over the fells to Ravenglass, where, disguised as a sailor, he lay till the wind was fair, and in a

* I knew old Neddy Birkett. He died in 1843, at the great age of ninety-eight years. Jonathan Otley recorded his death in his MSS., and added—"Was Hatfield's guide."

few days he set sail and harked back to Chester, his native county town. He was, however, arrested sixteen miles from Swansea, and brought through Keswick in irons, to be committed by Sir F. F. Vane, bart., at Armathwaite hall.

The prosecution was taken up by the Post Office department, and the case opened by Mr. Scarlett* at the Carlisle assizes, before the Honourable Alexander Thompson, knight. He was found guilty of forgery on three counts, the last of which was *franking letters* under the assumed name of A. Hope, M.P.

From the G.P.O. I have been favoured with a remark of Lord Aucland (one of the Postmasters General in 1802) on a paper relating to the prosecution of Hatfield:—

“Mr. Hatfield has dealt so largely in frauds, perjuries, and forgeries, that I heartily wish we may succeed in bringing him to condign and exemplary punishment.

“Date Nov. 9, 1802.”

Mary of Buttermere refused to take any part in the prosecution. The utmost she could be prevailed upon to do was to write to Sir Richard Ford, as follows:—

“The man whom I had the misfortune to marry, and who has ruined me and my aged parents, always told me he was the Hon. Colonel Hope, the next brother of the Earl of Hopetoun.

“Your grateful and unfortunate servant,

“MARY ROBINSON.”

Hatfield addressed the jury, and concluded with these words:—
“Whatever will be my fate, I am content; it is the sword of justice, impartially and virtuously administered. But, I solemnly declare, that in all my transactions I never intended to defraud or injure the persons whose names have appeared in the prosecution. This I will maintain to the last of my life.”

How he lied to the last will be seen by the concluding words of a letter from Hatfield to Mr. Freiling, secretary G.P.O., dated Carlisle, 30th July, 1803:—“For you will not admit information from such sources to *murder the peace and name of a truly venerable family for ever.*”

* Afterwards Sir James Scarlett, and eventually Lord Abinger.

On the day of his condemnation Wordsworth and Coleridge passed through Carlisle, and endeavoured to obtain an interview with him. Wordsworth succeeded; but from some unknown reason, Hatfield steadily refused to see Coleridge; a caprice which could not be penetrated. It was true that he had, during his whole residence at Keswick, avoided Coleridge with a solicitude which had revived the original suspicions against him in some quarters, after they had generally subsided. However, if not him, Coleridge saw and examined his very interesting papers. These were chiefly from women whom he had injured pretty much in the same way, and by the same impostures, as he had so recently practised in Cumberland. Great was the emotion of Coleridge when he afterwards recurred to these letters, and bitter—almost vindictive—was the indignation with which he spoke of Hatfield.

The execution took place at Carlisle on September 3rd, 1803, on an island formed by the river Eden on the north and south side of the city between the bridges. Three respectable men walked from Keswick to Carlisle—thirty miles—to witness the execution, so great was the excitement caused throughout the county by the event. One of them was Mr. Amos Richardson, the amiable and much-respected usher at Crosthwaite High School for a great number of years. I was a bit of a favourite with him, and I once had the temerity to ask him if he really did so. “Well,” said he, “we were going to Carlisle, and we did see Hatfield hanged.” I thought then, and I have the same feeling still, that I would rather have gone thirty miles in the opposite direction, to keep as far away as I could from so sad a spectacle.

Hatfield died with wonderful firmness, and acted the hero, dying as he had lived, the “lying Hatfield.”

This all happened while Mr. I'Anson was postmaster of Keswick.

When Mr. Atkinson succeeded Mr. I'Anson, the office was subsequently removed from the Oak inn to Museum Square. This Square used to be thought a grand improvement. A lady remembers when a child, before she had seen the squares of London, that she thought it a wonderful place. It was built by Words-

worth's "Waggoner," who also built Greta Hall and Greta Lodge, and was the genial landlord of Southey and Coleridge. Museum House was built for a carrier's inn, and an archway (now walled up) received his six-horse waggon for a few years. Licence was never applied for it as an inn, for he met with a tenant for the rest of the building in Mr. Peter Crosthwaite, who had just then commenced a museum for the entertainment of tourists. He began the museum on the opposite side of the Square in 1780, and removed to the opposite side in 1784. Mr. Atkinson, during the greater part of his postmastership, conducted the office opposite the museum, and he continued to do so till 1846, when he retired.

It may amuse you to mention some of Mr. Atkinson's subordinates in postal duties. Southey* thus mentions the letter carrier in writing to Grosvenor C. Bedford, Esq., on Dec. 28th, 1828 :—

"It is not likely that you should recollect a poor, harmless, honest old man, who used to deliver the letters when you were at Keswick; Joseph Littledale is his name, and, if you remember him, it will be by a chronic, husky cough, which generally announced his approach. Poor Littledale has this day explained the cause of our late rains, which have prevailed for the last five weeks, by a theory which will probably be as new to you as it is to me. 'I have observed,' he says, 'that when the moon is turned upward, we have fine weather after it; but if it is turned down, then we have a wet season. And the reason I think is, that when it is turned down it holds no water, like a bason, you know, and then down it all comes.'

"There, Grosvenor, it will be a long while before the march of intellect shall produce a theory as original as this, which I find upon enquiry to be the popular opinion here."

Many still living will remember, as I do, old Joe Littledale. He was the town bellman, and always ended his announcements with the loyal peroration :—

"God save the King,
His noble Consort the Queen, and
All the Royal Family!"

He died in 1836, aged eighty-six years.

Many will remember a successor as town letter-carrier. Peggy Hartley for many years filled the office, and she was a general

* *Life and Correspondence*, by Rev. C. C. Southey, Vol. v., p. 341.

favourite. She lived at the back of Museum Square, and at valentine time she had quite a harvest. Letters were taken upstairs two stories to her room, the door deftly opened, the valentines thrown in upon the floor, the door closed, and a stam pede made down the stairs, sometimes by little urchins in clogs, which made considerable clatter.

Another successor was John Musgrave, a clock and watchmaker, and a good hand at the business. He was succeeded by "post-man" Mary Pearson, of whom more hereafter.

But I must make mention of the mode by which the postbags came to Keswick and were dispatched to other towns. The riding boys were succeeded by men who drove a post-gig, depositing the leathern letter bags in a box which the driver sat upon. A pair of horse-pistols were delivered by the postmaster to each man when he set out on his journey, which he placed in holsters on either side of the splash-board in front of him. These were duly delivered up to the postmaster at the end of the day's journey. In recollection of these times a friend writes thus to me from South Devon :—

"So you are going to give an address upon the posting times of old. I think it would be about the year 1831 or 1832 that Mark Smith and Jacky Barnes drove the post-gigs. Jacky was a bit of a merchant; for I remember it was he who first introduced lucifer matches into Keswick, at sixpence a box. I presume they got to Whitehaven from Liverpool. The price was much too high for the boys at High School to use them instead of swinging the lighted peat in order to get a good kindle upon reaching the school; for I dare say you will remember the tinder was often too damp to take the light. Well! if such were called 'good old times,' the moderns have the advantage."

But a great change came for the better. The postman's gig was discontinued, and we had from Lancaster to Whitehaven well-appointed four-horse coaches, with driver and guard in scarlet coats and gold lace hatbands. Arnold and Burdett were the guards, and Tom Preston and David Johnston the drivers. Mr. Fitzsimmons of Whitehaven was the contractor; and the service was performed with great regularity. A worthy magistrate once said to me, "We travelled in great state in those days. We gave

up going to town in our private carriages, for the pleasure afforded by the speedy and safe conduct we had." The distance is about eighty miles from Lancaster to Whitehaven. Leaving Lancaster, the mail coaches served Milnthorpe, Kendal, Bowness, (the town of Windermere did not then exist,) Ambleside, Keswick, Cockermouth, Workington, and Whitehaven. The coaches generally crossed each other on Dunmail Raise. Arnold was quite a character; and for a racy account of him I commend to your perusal Mr. Wm. Wilson's little book on "Coaching, Past and Present."

Undoubtedly Tom Preston was one of the best whips in Britain. He would suffer no delays, and his blunt determination was sometimes set down as boorishness, but a kinder-hearted man never lived. Many a lift did he give to poor people tramping home burdened with market-day stores, when the coach was not full, without fee or reward, and not in the least detrimental to his employer or the service. Poor fellow! he had an awkward descent from the coach one day, which scraped his shin against the wheel, and brought on inflammation. The complaint reached his head, his mind wandered, and his ruling passion was strong in death. I was told he called out my name frequently, explaining the cause of being a few minutes late. He left his widow and family in good circumstances, and afforded each of his children a good education.

Burdett, a very smart guard, and a handsome man, left the service to become his father's successor as gamekeeper to a nobleman. He was succeeded by George Needles. Mr. Anthony Gibson and I travelled with him by coach on Shrove Tuesday, 1846, on our way to London. We went to see the great city together before I settled down to the office of postmaster, to which I calculated I would become a prisoner, if I followed the example of my predecessor. George Needles told me that he was born in a post office held by his parents in the central office in England, wherever that may be. He was an older man than Burdett, and continued in the service so long as Mr. Fitzsimmons had the contract for the mail service. After this the mail service was from

Windermere only, which was well carried out by Mr. John Rigg of Windermere hotel.

My predecessor, Mr. Atkinson, was a gentleman of the old school. He put a proper value upon his office, and the responsibility attached to its duties. Mrs. Atkinson, his wife, was a most discreet and exemplary lady. During her husband's long walks she attended to the office in Museum Square. I can see her still, dressed in a black silk gown, and a mob cap for head-gear—so seemly for matrons in those days. Mr. Atkinson used to indulge the townsfolk with many acts of kindness through sheer good nature; but as he never told them he was going beyond his duty, nobody was aware of it. He was not a man to court popularity—that sort of thing so much chased after now-a-days, of which the great Lord Mansfield said, that “it is gained without merit, and lost without a crime.” He was master of the situation, and he did his duty most scrupulously and well; and as for the chatter of the multitude he cared nothing.

He retired in 1846, and I succeeded him in the office. My preceptor was Mr. John St. Lawrence Beaufort, grandson of the Rt. Rev. Dr. John St. Lawrence, Bishop of Cork and Ross. He was a B.A. of Dublin University, an accomplished scholar, and a perfect gentleman. He entered the postal service under Mr. John Tilley (now Sir John Tilley, C.B.), and was then located at the Surveyor's office, Penrith. During the greater part of Mr. Atkinson's tenure of office, the old scale of charges restricted the number of letters, as I have before stated. Mary Pearson, the town letter carrier, told me that in Mr. Atkinson's time she had once gone to the office when the letters for the town were three in number, another time two, a third time one letter, and a fourth time when there were *none*. To the best of my recollection, she served thirty-five years; and I had the satisfaction of obtaining for her a small pension for good service. She performed the duties very well.

The great influx of letters which followed the adoption first of the fourpenny, and then the penny postage, rather disgusted Mr. Atkinson. A letter for which a person paid 1s. 1d. or 10d. was a

respectable commodity; but when a penny only had to be paid, he said people wrote about everything and nothing.

The custom had been to send letters for farmers and others to their "host's houses," i.e. the public houses where the farmers put up on market days. This Mr. Beaufort (under instructions) put an entire stop to. The letters were usually put into a card rack at the various inns, and the people helped themselves when they came to town. This was held to be quite insecure, and the country letters had now to be called for. To carry this new regulation out was my unpopular duty. Many attempts were made to tire me out. Manufacturers in the country told all their work people to call at the office window every time they came to town; and for a time they did so. But they did not tire me out, but tired themselves.

But Mr. Beaufort was intent upon making the service more efficient, and he at once saw that Braithwaite would be a good place for a sub-office and a daily rural messenger. Accordingly, within six months, viz. October 27th, 1846, a sub-office was opened at Braithwaite, and Mr. Thomas Gibson was appointed sub-postmaster, and William Greenip the first rural postman. "Old Bill," as he was familiarly called, was a notable man. He had served some years in the militia. He was a naturalist, mineralogist, an antiquary, and a great reader. The military discipline he had learnt, made him exact in the performance of his duty. His route was by way of Little Braithwaite, where he had to ford the river through floods which did not appal him, till once he was nearly taken away by the swollen river, when he asked, "Is I to gang to be drowned?" whereupon I told him never again to risk his life, even in the important matter of the delivery of the letters.

Mr. Stanger of Lairthwaite, writing of this beginning of rural posts, to his friend, the Rev. J. W. Whiteside, at Ripon, says:—

"Mr. Atkinson resigned the post office as too confining and laborious, and is I think much better since he did so. Mrs. A. rather failing in memory, &c., but pretty well. I got F. Crosthwaite appointed through our county member, and we have a branch office at Braithwaite, to which I got Thomas Gibson appointed, and we have a running postman between."

Mr. Beaufort was only able to be at Keswick ten days, when he was called away to take charge of the office at Berwick-upon Tweed, where he remained three months. He did the best he could to instruct me during his short stay. It was the season of the year when there is least correspondence. He invited me to his lodging in the evening, to read over the rules, and to ask questions where I wanted explanation. The evening before I took charge, while thus engaged, two friends called to see him. He gave me holiday, and enjoyed the evening with Mr. Lawrence Harrison and Mr. John Feather. Mr. Beaufort had been subject to acute attacks of asthma from his infancy. He was seized in the night, and had propped himself up in bed with pillows. He sent me word to dispatch the Wigton mail the best I could, and he would come down later in the day. I did so. There was a letter for Carlisle which I should have passed unnoticed, but it was unstamped, and had to be charged twopence. I entered this to Wigton upon the letter bill, and told him what I had done. "You will be reported for that," said he. Oddly, Mr. Tilley, his chief, called to see his friend Beaufort, and look into the office, just when we were opening the letter bags, when Mr. Beaufort spied the report and said, "*There you are—did not I tell you!*" He knew how keen the apprentice assistants were in the Wigton office to report, as my predecessor knew to his disgust. I can hardly say how mortified I was. But I had a great deal to learn from reports after this, in the course of threading my way into the regulations which were even then so numerous that it took months to learn them all. I never, so long as I had the office, examined the official correspondence without a sense of relief when I had seen it all. But it was not always necessary to send reports, where people were friendly disposed. I had sent a Peterborough letter to Lancaster to forward by mistake. The postmistress, Mrs. Mc.Glasson, wrote upon the top of the letter bill, "Your Peterborough letters should go to London." This photographed the information upon my memory much more agreeably than a formal report would have done.

The delivery of letters at this time was by post-woman Mary

Pearson; and as the higher part of the town was ordered to be delivered first, the people in the lower part of the town not unfrequently called at the window and asked for letters, which Mr. Atkinson good-naturedly gave them. Before the office was transferred to my side of the square, Mr. Beaufort was telling Mr. Atkinson not on any account to give out town letters at the window. Mr. Beaufort was standing with his back to the fire, with his hands in his shooting coat pockets, when giving this positive mandate. A knock came to the window, and a soft female voice whispered gently, "Any letters, Mr. Atkinson?" When he mechanically turned to the letter boxes and handed one out, and Miss Nanny Clark thanked him and departed. "There!" said Mr. Beaufort, "did I not tell you never to do that?" Mr. Atkinson's reply was, "Who could refuse a bonny lass like that?" I can still see the merry twinkle of Mr. Beaufort's eyes through his spectacles, although he affected to be very severe upon this breach of the rule.

It was the carrying out of this regulation which brought down upon me an attack in the *Cumberland Pacquet*, a Whitehaven newspaper. The letter was signed "A.B.," and was written by a manufacturer who lived down street. It was grossly inaccurate in all its statements. I cut it out and sent it to Mr. Beaufort at Berwick. He endorsed the letter thus, and sent it on to Mr. Tilley. "Poor Crosthwaite! He seems to be aggrieved. I told him he would be wise to take no notice of it; but if he wished to disabuse the editor, for whom he has a respect, he might write to Gibson of Whitehaven, who would explain it to him. J. St. L. B." Mr. Tilley's endorsement was: "The postmaster must on no account answer this. An anonymous letter in a newspaper is never worthy of notice. J. T. May 17th, 1846."

I did write to Mr. John Gibson, and I quoted Mr. Beaufort's words to me (in a separate letter) in which he said: "If you wish to disabuse the editor of the *Pacquet* of the bad impression the letter must have made upon him, provided he did not understand the subject sufficiently to see how absurd the writer's statements were, perhaps Mr. Gibson, the postmaster of Whitehaven, would

tell him for you privately what an injustice he has done you by publishing the letter in question. It will scarcely be necessary to explain it to Mr. Gibson." I have no doubt that Mr. John Gibson did me this little service, for I never again had any attack in the newspapers, either anonymously or otherwise, during my remaining term of office.

Speaking of these anonymous scribblers in the county newspapers, our neighbour the late Mrs. Barbara Dent, once asked: "Did you ever see anything that was true in the newspapers which went from Keswick?"

When the Braithwaite rural messenger was put upon his walk, Mr. J. R. Smith, from the surveyor's office, went the round with "old Bill." Mr. Thomas Gibson tells me that Mr. Beaufort went out before this to determine upon the route. He rode a white horse, and turned round on the brow top before the mill and took a good view of the district. Mr. Smith's duty was now to insist upon that route, to which old Bill's superior knowledge of the floods in that quarter, made him anticipate serious danger and difficulty. While Mr. Smith was instructing Mr. Gibson in his duties as sub-postmaster, Bill kept putting in his word every now and then about some difficulty or other in the way, and how he was to do in such and such a case; but the only answer Mr. Smith gave him to every enquiry was: "You must come the way we have come to-day." The way was round by Ullock and Little Braithwaite, terminating at Braithwaite village, the letters for Thornthwaite being taken on by the school children. At last Bill crowned the difficulties caused by bad roads and watery lonnings by saying that there were sometimes very deep floods at Little Braithwaite, when Mr. Smith got rather out of temper, and said somewhat sternly, "Well, you are not to be drowned."

Mr. Gibson says: "I have always had a great respect for old Bill. I sometimes think of him sitting by our kitchen fire smoking his pipe and waiting his time, and admiring our cat. You know he was a naturalist, and we had then a very fine young cat, and Bill admired it immensely, whether it was moving about or lying

on the rug, every attitude and motion he said was so fine and tiger-like."

William Greenip was sixty years of age when he entered upon his postal duties. After fifteen years service he retired with a small pension, and died two years later, aged seventy-seven years.

The next rural post was to Bassenthwaite. The messenger appointed had a much longer route. He had to go by Ormathwaite, Applethwaite, Millbeck, and on to Bassenthwaite village, where a sub-office was established, with Mr. William Hodgson, land surveyor, as first postmaster. This was on Sept. 22nd, 1848. Thomas Murray, then twenty-one years of age, was appointed rural postman. He had been well recommended by his employer, a clergyman. The neighbours, however, were anxious to have another man appointed, and some one wrote to Mr. Tilley that Tom was not sharp. Mr. Tilley came from Penrith by coach, and called at the office on his way to see the man, and judge for himself. He was very active, and walked very quickly, to return by the Penrith coach. He was very soon back again, having gone the distance at the rate of five miles an hour. He lost his errand, however, for Tom was at Robin Hood, two miles from Bassenthwaite, and there was no time to send for him. Mr. Tilley entrusted me with judging as to his fitness. I saw that he was very shy, but I believed him to be thoroughly competent. I took him to Mr. T. S. Spedding, J.P., Greta Bank, to make the declaration, which Mr. Spedding read over to him, and then said, "You know, Tommy, it means that you are not to take anything that is not your own." To which Tommy replied, "No, sir, I wadden't for the wardeld."

Never were truer words spoken. For nearly forty years he travelled that long route with a mule and spring cart, and I cannot bring to mind a single instance of any report against him for mis-delivery or mistake of any kind. He had a remarkably good memory, and did his service very efficiently. So well had he done his duty, that when in 1862 he was laid up for a week or ten days, a private gentleman voluntarily undertook his duties, and drove his mail cart, to the great satisfaction of the whole neighbourhood.

Mr. Carlisle Wm. Wake, of Ormathwaite House, did this good service, making the usual declaration, which I still hold as a relic of his good nature; it bears date June 3rd, 1862. When Tom attained his sixtieth year, he retired upon a well-earned pension, and when I told him the amount, he said, "Well, Mr. Crostet, I's varra satisfied."

In the year 1854, a sub-office was established at Rosthwaite, and James Langhorn got the appointment of rural messenger through the late Mr. John Steel, M.P., who believed him to be related to Mr. Ben Langhorn, an esteemed old clerk in his office. James was quick-footed, and went this ever-increasing distance until he was seventy years of age. He went through flooded roads as often as fifty times in one year. The distance was increased by having to go to Borrowdale Gates and the Ellers. Once he went through a flood over Grange bridge, which he only succeeded in doing by the help of a young farmer who took his arm. He had to deliver a letter to a Welsh clergyman who was corresponding about a living. Having delivered the letter, the clergyman insisted that James should call on his return to take back his reply. "Begging your pardon, sir, but I cannot; the flood is rising, and I cannot get back." "But you must," was the reply, "it is a matter of the greatest consequence to me." James replied, "And so is my life to me; I've got a wife and a small family." James had two daughters as tall as himself; but he quietly told me that they were small in number, if not in stature. At seventy years of age he retired from the route, taking a pension, but was allowed to take a short round near the town as auxiliary postman, which made up his former wage, which he enjoyed until within three months of his decease, at the age of seventy-four years. He was very kindly treated by the numerous tourists who visited Borrowdale, to whom he was most obliging; and he was frequently remembered by presents of books, and other tokens of friendship, on their return home, at Christmas and other times. He was a most exact and worthy man.*

* The following appreciative paragraph appeared in the newspapers at the time of James Langhorn's partial retirement:—

OUR RURAL POSTMEN.—The inhabitants of Borrowdale will learn with regret that they have lost the services of one of the most useful of public

In 1856, a sub-office was established at Threlked, and John Gill was appointed rural postman, an office which he held with great credit until 1876. He retired, after twenty-and-a-half years service, upon a small pension. During part of the time, he rode a white mule, and it was a unique sight to see him ride into the metropolis of the lake country (not unfrequently with his spectacles on) reminding one of the old prophets we have read about. I tried to get his steed toll free, but it was decided that he could not be allowed that privilege.

In the same year a rural post was established to Newlands. Here there was no office established. It is what is called a circular route. William Greenip, son of "old Bill" before mentioned, was the first to take the office. He went this route for sixteen years and a half, when he retired through rheumatism. He was very highly respected by the dalesmen of Newlands, and on his retirement was presented with a purse containing £11 (the only postman who ever received such a recognition of his services here), which was all the more appreciated by him because it was headed by General Sir John G. Woodford and Mrs. Spencer Bell, who appreciated his merit. He has still a small pension, having retired seventeen years ago. He is, like his late father, a naturalist, and a man full of local information, residing at Plosh, in the same house as that in which his father ended his days.*

On October 8, 1860, a circular post was established for Naddle servants. On Saturday last Mr. James Langhorn, who for twenty-nine years has fulfilled the office of rural postman for Borrowdale, was placed upon the retired list, Mr. W. E. White being appointed to fill the vacancy. During six days in the week for twenty-nine years, in every kind of weather (many a time during the winter months having to ford the pathway waist deep in water). "Old Jimmy," as he is familiarly called by the inhabitants and visitors, has trudged on foot in the exercise of his duty eighteen miles per day, or upwards of 162,000 miles during his period of service, nearly seven times the circumference of the earth. "Jimmy's" familiar figure will be missed by many of the visitors to the district, by whom he was well known and respected for his civility and attention.

* In Natural History he has studied Insects, Birds, Birds' Eggs, Geology, Mineralogy, Fossils (Graptolites of the Skiddaw Slate). In Botany, Ferns and nearly allied plants only. Of each of these he has specimens, which he disposes of to purchasers.

(Nathdale or Littledale), in the vale of St. John's. This was not an official appointment, but an allowance to the postmaster of seven shillings a week to find a man. Being the first piece of patronage of which I was possessed, I hit upon an old and respected school-fellow, John Musgrave, who undertook the duties, which he is still performing to the satisfaction of the department and the dalesfolk. His route has been gradually increased until he is now paid thirteen shillings and sixpence a week.

I have also to mention another circular post through the larger portion of the Vale of St. John's. This was commenced on the 30th of July, 1883. The authorities call it the Shundraw (or St. John's Vale post), Shundraw being a corruption of the ancient name Shundray Howe.

Thus it will be seen that from time to time the indefatigable surveyors of the district forecast the wants of the neighbourhood, and a system of local distribution of letters has been most ingeniously worked out. I was only too ready to fall in with every accommodation of this kind, and to help it forward. The result is, that there is scarcely a single outlying place within any reasonable distance which has not a daily delivery of letters, Sunday only excepted.

When the Windermere railway was completed, Windermere (formerly Birthwaite) was created a head post office, and Keswick and Ambleside were reduced to sub-offices under Windermere. I did not much like giving up the direct bag to London, and to have to correspond through Windermere. Miss Mary Nicholson, of Ambleside, however, did not care, and said, "Let them take the honour—the salary is all the same." She was a sprightly good clerk for her mother, who held the office for many years, and we became very intimate through official duties. This calls to memory how many ladies at that day had the sole charge of post offices. Miss Gottwaltz was postmistress of Preston; Mrs. Mc.Glasson of Lancaster; Mrs. Fenton of Kendal; Mrs. Nicholson of Ambleside; Miss Jane Kitchen of Maryport; and shortly before, Miss Collins of Workington. I am bound to say that ladies are excellent employes in the post office.

Early in my tenure of office my two sisters gave me very efficient help ; later on, my three daughters ; and all along, my wife ; and for many years my sister-in-law, Miss Crowdon. The Telegraph service has brought in a large number of female clerks into the large offices especially. My relative, Miss Kate Crosthwaite, has been in the Liverpool office for some years, acting in various branches of the service, and was within the last few months raised to be a clerk of the first class.

I 1870, Keswick was again raised to the dignity of a head office, much to my satisfaction. How the letters, newspapers, and book postage gradually increased may be readily imagined. But the department added on to the duties in 1861, Post Office Savings Banks, which at Keswick has flourished without diminishing the deposits of the old Keswick Savings Bank, which has been presided over with untiring devotion by the Rev. John Taylor of St. John's-in-the-Vale (coming in every Saturday through all kinds of weather) for the last thirty-three years. This is an instance of perseverance in the good work which would have charmed the late Mr. William Denton, whose successor he became at his earnest request. The present amount of deposits in that bank amount to £19,637 9s. 3d. Notwithstanding the steady prosperity of the old Savings Bank, the Post Office Savings Bank at the Keswick office has opened 1,354 accounts for persons who have no deposits in the old bank. The two banks for savings never interfered with each other. The Post Office Savings Bank receives deposits from travelling tradesfolks and young people, who can deposit one shilling and upwards at a time. The transactions at Keswick branch during the year 1888 were—number of deposits 828, and withdrawals 225.

I had held the office of Sub-Distributor of Stamps under the late Mr. William Wordsworth of Carlisle, since 1846, and in 1868 Keswick was raised to be a head distributor's office. I resigned this office, and it passed into three other hands, each in turn giving it up because it did not pay them. It came back to me, however, by order of the Post Office Department, and I held that post again until my retirement ; and so it continues with my successor.

In 1870, the Telegraph Service was put upon the Post Office,

which brought a large amount of extra responsibility. Then came the Government Annuities scheme, which has been taken advantage of by several provident persons. Lastly came the Parcels Post, in the year 1884. I thought this was the last straw to break the camel's back. But I never grumbled, but cheerfully carried out an arrangement which has proved to be a great success. I built a parcels office which answered admirably.

In the year 1850, my predecessor as postmaster retired from the Cumberland Union Bank, for which he had been agent since 1837. He told me of his intention, and he advised me to apply for the office. The late Mr. James Stanger recommended me to the directors, and volunteered to be one of my sureties, as did also my friend the late Mr. Abraham Fisher, as soon as he heard of it. I called upon the Rev. Frederick Myers, who volunteered his support, and with quiet humour he asked me, "How much have you for the Post Office?" I replied £60. "And how much will the Bank give?" I said £60. He smiled and said, "Why, you will be as well off as our curates!"

This was in the day of small things. I then gave up my own business, and devoted my time entirely to the development of the two offices. In the year 1864 the Cumberland Union Bank built a new bank and dwelling-house immediately opposite to Museum Square. In addition, a new office for my accommodation as postmaster. There was no allowance for office rent from the department until very recently, so that I was indebted to the bank for the improved accommodation which was given to the public according to a plan suggested by the surveyor.

Mr. Atkinson was postmaster from 1808 to 1846, for the long period of thirty-eight years; and I, from 1846 till 1888, giving me forty-two years tenure of office. So that between us we held the postmastership for eighty years. Perhaps there are few offices which have had a similar experience.

For more than three years I was intent upon retiring from the postmastership, and I consulted the late Mr. James, my surveyor, upon the subject. He came to see me, and kindly promised me extra help, and said that I must have a holiday, and I must on no

account give it up. He was good enough to say, "You do it so well, we won't let you." Mr. James was a year or two my junior, and he himself found it necessary to retire, and he only lived six months after he left the service. He was a most amiable gentleman, and the whole northern district regretted him.

When in Manchester seeing the great Exhibition in 1887, I called upon my first preceptor, Mr. John St. Lawrence Beaufort, then postmaster of Manchester. I thought him looking very aged. I thought he might be ten years my senior. I reminded him of the attack of asthma he had at Keswick. He said, "Yes, the attacks were violent when they came then;" and, touching his chest, he added, "but now it is there always." I had touched a chord of memory which led him to ask if I ever saw his good friend Mr. Lawrence Harrison, and how he was. I told him that I had seen him shortly before, and he was still as straight as an arrow. He then said, "Do you ever see Mrs. Teather? and how is she?" To this I was also able to answer him, that she was living at Keswick, and very well for her years. In a few short weeks he passed away, and having died in harness, there was great respect shown to his worth by the public funeral, which took place at Prestwich, at which my friend Mr. J. D. Rich, the esteemed postmaster of Liverpool, and many officials of the Post Office far and near, attended. I was surprised to find, when I saw the notice of his decease, that he was only one year my senior.

This event spurred me on in my determination to retire. I again applied to my chief, Mr. G. A. Yeld, for his advice and assistance, which he accorded to me in such a way as shall ever be gratefully remembered by me.

I served under seven surveyors. Mr. John Tilley was the first. When he became secretary to the General Post Office, I wrote to congratulate him. He replied as follows:—

"March 22nd, 1864.

"My Dear Sir,

"I am very much obliged to you indeed for writing to congratulate me on my appointment. It was very kind of you. I am glad that you too have prospered. Very faithfully yours,

J. TILLEY."

When Mr. John St. L. Beaufort left the Northern District to be surveyor in Wales, I wrote to congratulate him, and here is his reply :—

“Oswestry, 18th Nov., 1854.

“Dear Sir,

“I am much obliged by your congratulations on my promotion, and your good wishes for my future prosperity. I should be glad if I could find even a few of my postmasters in this district as zealous and attentive as I always found you, and I wish you success and happiness. J. ST. L. BEAUFORT.”

Mr. John Patten Goode succeeded Mr. Tilley as surveyor of the Northern District, and he was Goode by name and good by nature. If I could extend my paper I could recount many kind and considerate acts of his to myself and my subordinates, but time forbids. He went into the south in the same capacity, and I believe he is still living, although retired from the service.

My next surveyor was Mr. Christopher Hodgson, a Carlisle gentleman, and an intimate friend of the late Mr. Joseph Hall, solicitor, of Keswick. He died a comparatively young man, but he was as energetic and efficient in the service as any of his predecessors.

Then came Mr. Richard Hobson, also a Cumberland gentleman, a most energetic officer, who left us to occupy the important post-mastership of Glasgow. He is also surveyor of his own office, and of a large district adjacent to Glasgow. I have had many proofs of his goodwill since he left us, and I believe there is not a more efficient officer in the public service anywhere.

Mr. Hobson was succeeded by Mr. T. B. Harkness, another Cumberland gentleman. He retired from the service in middle age, and is since deceased. He was a most estimable man, and was much regretted.

Mr. Henry James succeeded him, and I have already spoken of the kindly way in which he acted when I asked his advice as to my retirement. Mountains of difficulty arose to my mind's eye in contemplating the change; the principal one, however, was, what would become of my subordinates. I had received an allowance for assistance, and had disbursed myself for this help far in excess

of the allowance. This was perfectly right, so far as I was concerned, but how was it to be made up on my retirement? Mr. James set on foot a new organization of the office, which ended in my two eldest subordinates being made first and second clerks in the establishment, at the same pay which I had hitherto given to them. Mr. Daniel Crosthwaite became chief clerk, and Mr. Edward Peel second. The unappointed clerks were also continued at the same remuneration as they had been receiving before. I now felt quite easy in the prospect of retirement.

The seventh surveyor, Mr. G. A. Yeld (whom I had known before in this district) made my retirement as agreeable as possible, and thus assisted in every way in rewarding an old servant of the Post Office. My experience of the treatment which the department always accorded to me, leaves grateful recollection upon my memory.

I am afraid I have wearied you with my long story. I have said nothing with regard to the present amount of labour, and the extent to which the service has grown.

I have before me a return of letters, book packets and circulars, newspapers, and post cards, from 1870 to 1888. I give you the first and last years, which contrast with my predecessor's remark, that he could put all the correspondence in his breeches pocket. I take a week in the month of August, which is perhaps the highest in the season :—

	Letters	Books and Postal Circulars	News- papers	Post Cards	Total	Parcels
1870	7,691	1,517	885	639	10,732	—
1888	10,660	2,106	1,772	1,179	15,717	558

When it is considered that this increase has taken place despite the receding manufacturing industries of Keswick, especially the entire loss of woollen manufacture, I think it proves one thing, which is, that the accommodation given by the Post Office department has anticipated the requirements of the neighbourhood, and helped on the prosperity of the country.

The Telegraph Service has gradually developed, and the following

figures will show the aggregate for the year ending December 31st, 1888 :—

Forwarded	Received	Transmitted	Total
8,214	7,800	6,201	22,215

The money business for the same period was as follows :—

Money Orders issued	...	1,479	} Total 2,690
Do. paid	...	1,211	

The Postal Orders issued and paid far exceed the money orders, the numbers being for the same year (1888) as follows :—

Postal Orders issued	...	11,239	} Total 17,471
Do. paid	...	6,232	

This enormous increase of the use of Postal Orders has caused a decrease in the number of letters registered during the last year, but they are still very numerous :—

Year	At Keswick	At Sub-Offices	Total
1887	1,867	698	2,565
1888	1,139	756	1,895

Showing a Decrease of 670

At the outset I mentioned that I had only one female letter carrier and myself to do the whole work of the office, except of course the assistance I had from my family. To contrast with this, the service had grown until there were, when I retired, no fewer than thirty-five persons in connexion with Keswick and the sub-offices under Keswick, viz :—

Postmaster	...	...	...	1
Clerks and Assistants	...	...	...	4
Sub-Postmasters	...	...	...	7
Rural Postmen	...	...	...	7
Town Letter Carriers	...	...	...	5
Telegraph Messengers	...	...	...	6
Sub-Office Rural Postmen	...	...	...	5

Total 35

I retired from the postmastership on the 31st of May, 1888. I was completely relieved of my duties on that day by Mr. Christopher Newby, who came as officer in charge. This relief, coming before entering upon another summer's duties, was so opportune, that I did not need to be exhorted to "rest and be thankful."

The office was advertised in the *Weekly Postal Circular*, which goes to every office in the United Kingdom. It was open to all officers of the Post Office department, and applications were made by candidates through their superior officers, from Manchester, Liverpool, Glasgow, Carlisle, Penrith, Whitehaven, and other places. These cases had each to be examined into, and, after six months, the appointment was given to Mr. Wm. Mc.Kenzie, chief clerk in the Whitehaven Post Office, with which he had been connected for eighteen years. From his long experience he is eminently qualified for the post, and he had my hearty congratulations on coming to take charge of the office, which I am sure he will fill to the entire satisfaction of the department; and the townspeople will find him in every way well qualified to discharge his onerous duties. He already likes Keswick, and I believe the people of Keswick will soon find cause to like him. I am sure that he will receive the same friendly reception which Keswick folks are in the habit of according to those who come to settle in the town.

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THE HELM WIND.

By J. G. GOODCHILD, H.M. GEOL. SURVEY.

ONE of the chief objects of the Cumberland and Westmorland Association is the investigation of any local phenomena of special interest, particularly those that happen to be peculiar to the district, and that are at the same time imperfectly understood. It seems to me that the subject of the Helm Wind is pre-eminently of this nature.

It is nearly peculiar to that part of Cumberland and Westmorland traversed by the river Eden, which, for want of a better name, I have commonly referred to as Edenside. Much has been written about the Helm Wind during the last two centuries (in both prose and verse), and yet it seems to me that the nature of the phenomenon, or at all events the exact nature of the causes that give rise to it, is as far off being well understood as ever. The facts themselves are simple enough, and are known, only too well, to nearly every dweller by the fellsides where the wind prevails. Briefly stated they are something of this nature :— At certain seasons of the year, most commonly in the late spring, a violent wind, with a prevalent easterly direction, rushes downward from the higher parts of the Cross Fell Escarpment, sweeps a short distance outward across the lowlands at its foot, and then, to all appearance, gradually subsides, or even gives place a mile or so further out, to a gentler breeze, which travels in the opposite direction, or from the lowlands towards the Escarpment. The

Helm Wind descends with greatest force in the neighbourhood of the highest elevation of the Escarpment, being strongest along a zone extending a few miles on each side of Cross Fell, and gradually diminishing in force in proportion to the distance on either side from this centre.

But that is not its only peculiarity. While a furious gale is rushing down the lower part of the Escarpment, repeated observation has shewn that on the summit, as well as on its windward side, the gale gradually declines in force; so that while "the Helm is on" at Milburn, for example, there is hardly any wind at all at the back of Dun Fell, although that lies in what seafaring men call the wind's eye in relation to that village.

While the wind prevails a long spindle-shaped mass of cloud remains in apparent suspension at a variable distance above the line of highest ground on both sides of Cross Fell. It is probably the almost constant accompaniment of this covering, or helm, of visible moisture, that has gained for the wind its popular name. The word helm, of course, is an old English word for a covering, cap, or something that conceals the head.

Let us regard the facts in another light. If we are travelling, say, from Alston towards Penrith when the conditions suitable for the development of the wind obtain, we might travel upwards to the summit ridge without noticing more than a moderate breeze setting westwards, up the slopes, or in the direction of the Escarpment. The cloud hanging above the line of highest ground would be present, but would probably attract but little attention in a district where mists are so commonly present. On descending the road, however, we should find at first a strong breeze setting in; and, as we advance towards the foot of the declivity this breeze would seem to rapidly increase in force, until it eventually takes on the character of a violent gale, whose greatest force is experienced near the zone where the mountain slopes merge into the undulating lowlands that range at their foot. After passing through Melmerby, it would be noticed that the gale gradually diminished in force; and at the distance of a mile or so in the direction of Penrith it appears to drop entirely. The wind, so far,

has been blowing, in the main, from east to west ; but on arriving at the brow above Langanby we should commonly find a gentle breeze blowing from the opposite direction, or from west eastwards—from the lowlands in the direction of the Escarpment.

Phenomena of exactly the same nature prevail all along the zone traversed by the Helm Wind, whether the observation be made at Melmerby, at Kirkland, at Milburn, or at Knock. There is a long narrow zone of country along the fell sides where the violent easterly wind prevails, while parallel to that zone lies another where there is a small belt of calms, which again has on its lowland side a zone of gentle breezes travelling from the west to the east.

More extended observations upon the direction of the Helm Wind shew that we are dealing with a cyclone, which is generated by some peculiar local causes, and which is clearly advancing in a spiral direction from the S.E. towards the N.W. along an axis situated a few hundred feet above the ground at the foot of the Escarpment. We have, in fact, phenomena analogous to a waterfall, only that instead of the visible fluid water, our cataract consists of the invisible fluid air.

Everyone that has considered the subject has perceived that there must be an intimate connection between this phenomenon and the shape of the ground in the locality where the Helm Wind is generated. To understand this we must examine the local physiography a little more closely. From Carlisle it is hardly possible to obtain anything like just ideas upon the features that are essential in the present case. The true nature of the surface relief is best gathered from such points of view as the summits of the hills west of the Eden, especially from those between Lazonby and Penrith. Eastward from such a standpoint the general level of the broader features of the surface gradually declines until it merges into a gently undulating plain, which the eye can easily trace past Melmerby, Milburn, Dufton, and Murton to Brough, on the one hand ; and, in the other direction can be as easily followed until it merges into the plain bordering on the Solway.*

* This plain is the Third Plain of my former papers, and is probably of Precretaceous age.

Beyond the eastern limit of this plain rises abruptly the bold features of the Cross Fell Escarpment (or what fellsiders call the Black Fell Side); whose steep slopes and elevated summits form a most striking contrast with the lowlands at their feet. The average level of the plain is about seven hundred feet above the sea; that of the summit of the Escarpment rises above that level nearly two thousand feet.

It should be noted that the Escarpment itself ranges from south-east to north-west, so that its slopes face in such a direction as to receive the full strength of the sun's rays during the warmer parts of the day. There is, therefore, but little peat except in a few sheltered hollows. Moreover the steep slope tends to run the surface water off quickly, and thereby to keep the surface drier than it would be otherwise. More than that. The general inclination of the strata there is inward from the face of the Escarpment; so that even the underground drainage is conducted towards the east. All these causes tend to promote a warmer and a drier condition of the surface than would usually characterise uplands of the same general nature but differently placed. The general effect of the sun's rays falling upon the Escarpment is to raise the temperature, and therefore to lower the density, of the air next it, to almost the same extent as prevails over the adjoining lowlands of Edenside. When, therefore, no extraneous currents intervene to cause disturbance, the air from the lowlands has a general tendency to rise.

Now if we shift our place of observation to one of the eminences of the Escarpment and compare the physiography of the surface at the back of the fellside with that we have just seen, a marked contrast is at once evident. From the summit crest the mountain tops (which represent, nearly, the original level of a great plain inclined eastward) gradually fall in elevation as they are traced towards the north-east and the east. The valleys are mere accidental depressions due to the removal by denudation of part of the old plain; they may be left out of account in the present enquiry. Looking at the surface as a whole one sees that it consists of a vast extent of dark moory uplands, overspread nearly

everywhere by a mantle of black, sodden, spongy peat, whence, at most seasons of the year, moisture oozes out and saturates everything within reach. It is only along a crag, or at the bottoms of a few valleys that drier conditions prevail.

This marked difference in the physiography of the regions at the back of the fell and along its face, or on either side of the Escarpment, is intimately connected with the factors concerned in the generation of the Helm Wind. What happens I conceive to be this. A light breeze blowing from east to west strikes the shores of Durham and travels inland. Where the wind traverses the warmer and drier lowlands bordering the coast its temperature is slightly raised, and its density diminished in proportion. Travelling inland, it encounters, on the west side of a north and south line through Bishop Auckland, the commencement of the slope whose westward continuation forms the moory uplands just referred to. Here the wind passes across a surface that is perennially moist, and, as it travels inland, it traverses for a distance of nearly thirty miles in a direct line, a surface wrapped in wet peat, whose moisture is in a condition the most favourable possible for rapid evaporation. Millions of tons of water must be withdrawn from the wet peat daily by the action of the wind alone. As a result of this process of evaporation the temperature of the air becomes lower and lower by this cause, as it travels nearer to the Escarpment. With the lowering of the temperature the density of the air is increased, and reaches its maximum density where the culminating ridge is attained. Another factor may contribute to the same result, namely, the heaping up of the air driven from the sea level up a slope to an elevation of between two thousand and three thousand feet above the sea. Mr. William Atkinson of Knock considers that this is the most important factor of all in the generation of the Helm Wind. Be either factor the more important, or be both equally concerned, it is quite certain that the denser mass of air moving westward presently reaches the edge of the Escarpment, where, as we have seen, the surface rapidly falls to a level lower by nearly two thousand feet. It is along this zone that we meet with the thick stratum of warmer and lighter

air, which is constantly tending to rise from the lowlands of Edenside and the face of the Escarpment. The two strata—the colder and denser stratum, and the warmer and rarer, therefore meet along this line. An abrupt disturbance of equilibrium ensues. The heavier mass (or that which is most compressed, according to Mr. Atkinson) at once begins to flow to the lower level, rapidly increasing in velocity as it descends, until its rate of motion amounts to that of a gale. On reaching the lowlands its momentum causes it to rebound, and to rise some distance above the surface, where it resumes its initial direction and flows on until it reaches the zone where complete equilibrium is restored. As the direction of the Escarpment, and therefore of the zone where the wind is generated, is inclined thirty degrees or more to the direction of the east wind, a spiral movement is propagated. This may be better understood by tracing the course taken by any light body transported by the wind. Such a body would reach the ground at Milburn from a starting place on Dufton Fell, it would travel from Milburn outwards to Blencarn, thence, rising in the air it would be carried over Ousby by the spiral current and then again to the low ground, say at Melmerby.

The locus of strongest impact of the Helm Wind must vary greatly according to local circumstances. Usually it would sweep down directly upon the fell sides and expend its force before reaching the lowland area adjoining. But as there are necessarily considerable variations in both the direction and the force of the generating currents of air, the zone where the wind strikes the ground with greatest force must vary accordingly. This enables us to account for the curious fact that sometimes the Helm Wind is blowing violently on the lower part of the fells, while a mile or two outward in the direction of the lowlands a comparative calm prevails; or, on the other hand, that a strong wind may be blowing along a zone parallel to the fells while there is almost no wind at all on the slopes adjoining.

The Helm Bar does not call for any special remark, as the mode of formation of any such apparently-stationary masses of visible moisture is already well known.

[It is right to mention that this paper is based upon the paragraph on the "Helm Wind" given in my article "Westmorland" in the latest edition of the *Encyclopædia Britannica*.—J. G. G.]

THE BOTANY OF THE SOLWAY SHORE.*

Parts 2 and 3.

By WM. HODGSON, Esq., A.L.S., BOTANICAL RECORDER TO
THE ASSOCIATION.

(Read at Carlisle and at Longtown.)

UMBELLIFERÆ.

Hydrocotyle vulgaris, common in swamps and bogs quite down to shore level; very common in Salta Moss, by Dubmill. The smallest native umbellifer. *Sanicula europæa*, not so closely approaching the coast as the foregoing, but conspicuously plentiful in Flimby Wood, and similar localities. *Eryngium maritimum*; the Sea Holly is everywhere plentiful along the shore where light sand and gravel prevail, and is highly ornamental when seen in full bloom a little after midsummer. *Apium graveolens*, on the contrary, is comparatively rare, and found only on muddy flats or by the edge of creeks, mostly within the reach of tidal influence, as the Cloffocks at Workington, Whitrigg Marsh, Kirkbride, &c *Helosciadium nodiflorum* appears by the Old Reservoir at Maryport, and in the brook which empties into the sea close to Bank End farm; and *H. inundatum* grows in abundance in a swampy little patch of ground close to the seaside pathway near the Workington Artillery storehouse. *Ægopodium podagraria* flourishes on rubbish heaps and patches of waste ground, whether on the beach or far removed inland. *Bunium flexuosum*, on the drier parts of the coast frequent, and very widely distributed. *Pimpinella saxifraga* abounds in

* The publication of this paper was unavoidably postponed last year.

similar situations, and is especially plentiful between Flimby and Workington. *Bupleurum rotundifolium*; only once seen on the Silloth ballast heaps, with other casuals, in 1881, and not likely to be permanently established. *Ænanthe fistulosa* grew formerly in small quantity in swampy ground near the Old Kiln farm at Dubmill, but not seen there in 1887 or 1888. *Æ. crocata*; rather too plentiful by brooks or in swampy localities; a somewhat dangerous plant, as cattle have been poisoned by cropping its foliage or masticating the digitate roots when rendered soft by exposure to the atmosphere, on banks where they have been carelessly thrown on clearing out watercourses in winter; it grows in great plenty and luxuriance on the south bank of the Old Reservoir at Maryport, &c. *Crithmum maritimum*, the "Samphire" of Shakespeare, grows on the cliffs at St. Bees, and has occasionally taken root on the beach on both sides of that headland, doubtless lodged there by the tide. *Angelica sylvestris*, locally "Smooth Kesh," is found from shore level at Maryport and elsewhere, almost up to an altitude of 2000 feet by some of our mountain streams. *Heracleum sphondylium*, "Rough Kesh," or Hogweed, is almost universally distributed, though not reaching an elevation so lofty as the Smooth Kesh. *Daucus carota*; plentiful in friable or sandy soil all along the coast. *Caucalis daucoides*; not reckoned indigenous, perhaps, in any part of Cumberland; has appeared at Maryport, Whitehaven, and Silloth; at the last mentioned station for several years in succession. *Chærophyllum sylvestre*; a common hedgerow plant, and one of the earliest-flowering members of this extensive order. *C. temulum*; equally plentiful with the last, but a little later in coming into flower, and further distinguished by its less robust habit, and purplish and hairy flower stalks; in full bloom about ten days before midsummer. *Myrrhis odorata*; usually not far from houses, leading to the inference that it has been cultivated by our ancestors for some economic purpose; in my boyhood, I have seen beekeepers rub the inside of empty hives with the fragrant leaves of "Sweet Cicely" as an inducement to the newly swarmed bees to take possession of their perfumed dwelling; I remain sceptical as to the efficacy of the proceeding. *Scandix pec-*

tenveneris once grew about the Bent-hills, Maryport, but has been quite obliterated there by unsightly slag-banks from the iron furnaces. *Conium maculatum*, not unfrequently seen towards the coast, and is rather common about Workington, High Harrington, &c.

ARALIACEÆ.

The only British representative of this order is *Hedera helix*, Common Ivy, a well known ornament of old trees and ruined buildings.

CAPRIFOLIACEÆ.

Adoxa moschatellina; this pretty little species is to be found as early as April on dry hedgebanks; from the peculiar arrangement of its flowers, Carlisle youngsters have nicknamed it "The Town Hall Clock." *Sambucus nigra*; a well-known tree, from the fruit of which, or rather its expressed juice, a pleasant beverage known as "Elder-berry Syrup," is concocted by village housewives. *Lonicera periclymenum*; few shrubs are better known even by children than the Honeysuckle, the fragrance of whose blossoms we have all appreciated in the hedgerows of country lanes.

RUBIACEÆ.

Many of the Bed-Straw family are to be met with during seaside rambles; among others may be enumerated *Galium cruciatum* and *G. verum*, both with yellow blossoms; while *G. mollugo*, *G. saxatile*, *G. palustre*, *G. uliginosum*, and *G. aparine* all produce white flowers. *Asperula odorata*, better known as Sweet-scented Wood-ruffe, though sparsely found towards the shore, is yet remarkably abundant in Flimby Wood, and other places but little distant from it.

VALERIANACEÆ.

Valeriana dioica; though the swampy upland meadows of the Lake District are the proper home of this species, it is occasionally met with near the shore where sufficient moisture prevails.

V. officinalis, also a swamp-loving plant, approaches the coast; I gathered very luxuriant specimens on the seaside rocks near Harrington in 1888. *Valerianella olitoria*, cultivated in former times as a salad herb, under the name of "Lamb's Lettuce," appears plentifully on dry banks in the neighbourhood of Bowness and elsewhere; its early maturity is leading to its re-introduction to garden culture in some parts of the kingdom.

DIPSACEÆ.

Scabiosa succisa is everywhere present in moist meadow and pasture ground. *S. arvensis*, plentiful on dry banks among sand or gravel, particularly in the neighbourhood of Whitehaven, where its large lilac flowers are very showy. Mr. Duckworth tells that at an exhibition of wild flowers its introduction into a child's bouquet led to disqualification, on the ground of its being a *garden* plant.

COMPOSITÆ.

Carduus tenuiflorus, has grown in patches during several seasons on a railway embankment leading to the Senhouse Dock at Maryport; also observed at Silloth by Miss Glaister of Black Dyke. *C. nutans*, reported from Silloth both by Miss Glaister and Dr. Leitch; other stations are assigned for this species, none of which are sufficiently near the coast to merit a place here. *C. crispus*, a very abundant species confined to light friable soils, on rubbish heaps and hedgebanks, and seldom found in ground under tillage; at Workington, Flimby, Silloth, &c. *C. lanceolatus* is but too well known as the Burr Thistle. *C. palustris*, frequently found with white flowers, is rarely absent from ancient meadows, especially where moisture is prevalent. *C. arvensis* is, however, the greatest pest to the agriculturist, being well nigh ubiquitous, and difficult to eradicate. *Arctium lappa*; the singularly hooked heads of the Burdock are familiar to every mischievous little urchin. *Centaurea nigra*, the "Horse-knops" of local farmers, is another well-known form of plant life. *C. cyanus* has been found on the ballast heaps at Maryport, associated with *C. melitensis* and *C. calocephala*, both of foreign origin, and probably introduced with grain cargoes; the

bright yellow blossoms of the latter are strikingly handsome and showy. *Chrysanthemum segetum*, as a weed of tillage very abundant in green crops, especially in the St. Bees district; I remember during a wet season, when the weeds had not died down in the furrows after being pulled up, seeing a field of turnips there presenting the appearance of being covered with a gigantic carpeting, striped alternately green and yellow. *C. leucanthemum*; in boyhood I remember hearing a nonagenarian yeoman assert that within his recollection—dating probably one hundred and fifty years back—the Ox-eyed Daisy was unknown in the neighbourhood of Carlisle, and owed its introduction to imperfectly dressed samples of seed corn (oats). *Matricaria inodora*, one of the most abundant and conspicuous plants of the coast line, sometimes seen in too great plenty among corn crops far inland; two distinct varieties are recognised. *Tanacetum vulgare*, seen at remote intervals, and generally on rubbish out-thrown from gardens. *Anthemis cotula*, a few plants noticed of late years among ballast and rubbish deposited on the beach near Maryport; its permanence is doubtful, and certainly not desirable. *Achillea millefolium*; common everywhere; a variety with pink blossoms is not infrequent on the shore line. *A. ptarmica*; not so generally distributed as the foregoing species, but far from being rare; prefers moisture. *Artemisia vulgaris*; not rare, but towards the coast confined to mud heaps or deposits on waste ground: on the North Shore at Workington near the Lonsdale Dock, about Risehow, and at Maryport. *Filago minima*; this species, the least of the Cudweeds, grows most abundantly about Silloth. *Gnaphalium uliginosum*; a densely cottony plant; grows commonly in ditch sides, or places where water has stood during winter. *Senecio vulgaris* is pretty nearly ubiquitous as a garden weed, and a tenant of waste ground. *S. sylvaticus* grows close to the shore in the neighbourhood of Dubmill, and about the Salt pans. *S. viscosus*, the stinking species, flourishes in very great abundance on the North Shore at Workington, between the iron furnaces and the sea, and is fairly plentiful along the coast to Silloth and Bowness. *S. jacobea* and *S. aquaticus* are also of common occurrence, the former in dry pastures, and

the latter in watery places. *Bellis perennis*, our oldest friend, the Daisy, common everywhere. *Aster tripolium*; not infrequent on muddy banks overflowed by the tide, about river estuaries, from Millom to Bowness. *Solidago virgo-aurea*; rarely approaches the coast, though seen on the rocky bluffs between Harrington and Whitehaven. *Tussilago farfara*; a plant of wide distribution, and distinctly unpopular with the farming community, is the common Coltsfoot. *Petasites vulgaris*, sometimes called Giant Coltsfoot, is found by river banks quite down to their confluence with the sea. *Eupatorium cannabinum* flourishes in great abundance on the Harrington rocks, just referred to in connection with Golden Rod. *Cichorium intybus*; not indigenous here, but is sometimes found in forage crops, introduced probably among ryegrass or clover seeds; some years ago this very pretty plant was cultivated at Hayton, near Aspatria, on behalf of a firm of grocers in Liverpool who had family connections with Hayton. *Lapsana vulgaris*; a plant of extensive distribution, as well towards the coast, as inland; few rubbish heaps or patches of waste ground are without specimens. *Hypochaeris radicata*; not infrequent in sandy loam, which its roots penetrate to a considerable depth. *Leontodon hirtus* is reported from the coast sandhills at Drigg by Professor D. Oliver. *L. hispidus*; like others of the family, flourishes in deep sandy loam. *L. autumnalis*; the most frequently met with of any of the Hawkbits; common in fog-time in many of the meadows towards the shore. *Tragopogon pratensis*; a common plant, found sparingly along the coast; but is plentiful along the line of the M. & C. Railway almost throughout its length. *Taraxacum officinale*; almost universal in distribution; the occurrence of a somewhat rare variety, *T. erythrospermum*, has been reported from Silloth by my colleague, the Rev. R. Wood of Rosley Vicarage. *Sonchus oleraceus*, *S. asper*, *S. arvensis*; examples of each of these are not unusual. *Crepis virens*; an abundant species, assuming many varieties of form in different soils and under different aspects. *Hieracium pilosella*; a pretty little occupant of dry hedgebanks. Few of the Hawkweeds are occupants of the shore line. *H. vulgatum*; not infrequent,

especially about quarry banks or railway cuttings; in such situations it is sometimes found in abundance, and may be classed as local rather than rare. *H. umbellatum*; I have recently gathered this species growing among loose sand and gravel a few yards only from the Railway Station at Siddick Junction, on the side next to Flimby. *H. boreale*; a common species, appearing frequently along the shore; very abundant by the railway between Dearham Bridge and Bullgill stations; a large and coarse-looking plant, nicknamed "Grim the collier" in some parts of Cumberland.

CAMPANULACEÆ.

Jasione montana; a common occupant of friable soils towards the coast as well as inland; I remember seeing some fields near New Cooper quite covered with it, and having a distinctly azure tint in consequence. *Campanula latifolia*; a characteristic ornament of most of our river banks, and found thereon quite down to shore level; strangers to the district are loud in their admiration of this grand-looking wild flower, which I have heard designated as the White Foxglove. *C. rotundifolia*; more abundant and widely-distributed than the species just referred to; Mr. W. Duckworth notes that its flowers may be expected to appear about the last week in June, which closely agrees with my own experience, save that in more elevated districts, towards the mountains, the date may be a few days later. I remember the late Rev. H. H. Wood, F.R.S., telling me once that in his Dorsetshire parish, near Sherborne, the Bluebell was unknown, and so also was *Senecio jacobæa*, the Common Ragwort. How greatly we should miss them here!

ERICACEÆ.

Vaccinium oxycoccos; commonly found in swampy uplands, heaths, and peat-bogs; and only finds a place in these notes from its appearance in Salta Moss, close to the shore, behind Dubmill, though but sparingly represented there. *V. myrtillus*, Bleaberry of our dalesmen, also approaches close to the shore

at many stations along the coast, although the fruit in such places is decidedly inferior to that gathered on the mountains. *Andromeda polifolia* ; found in abundance on Bowness Moss, and less frequently on Salta Moss ; in both cases not much above shore level. *Erica tetralix*, *E. cinerea*, *Calluna vulgaris*, are all more or less common in the Mosses already referred to ; *E. cinerea* also grows between the West Cumberland Iron Works and the beach ; its proper home, however, is among the rugged bluffs of Ennerdale, Wastdale, or Borrowdale, where its purple bloom makes a splendid show in July and August ; the Pyrolas, which stand next in the Catalogue, are seldom found in proximity to the sea, although *Pyrola minor* grows in the drier parts of Flimby Wood.

GENTIANACEÆ.

Erythræa litoralis is reported from Cardurnock by Dr. Leitch of Silloth, as is also *E. latifolia* from Birkby, near Maryport, by the same gentleman ; the common type of Centaury, such as is sold in our market, is frequent in all the stiff soil over Flimby, Broughton, and Ellenborough Moors, &c. *Menyanthes trifoliata* is found in Salta Moss, associated with several of the peat-loving species already referred to.

CONVOLVULACEÆ.

Convolvulus arvensis is abundant in a garden hedgerow at Flimby Vicarage ; and *C. sepium* may be seen close to the beach at Waterloo Terrace in the same small parish. *C. soldonella*, also on the beach near Fothergill, and here and there along the coast as far as Seascale, where it appears very showy on the gravelly shore.

SOLANACEÆ.

Solanum dulcamara ; this trailing shrub is conspicuously plentiful in a sea-side hedgerow not far from Bank End, Maryport ; common also about Mossbay. *Hyoscyamus niger* ; once plentiful about the Maryport Railway station, though now obliterated ;

stray specimens occur about the Senhouse Dock, also at Silloth, and on a patch of waste ground at Dubmill ; very poisonous.

SCROPHULARIACEÆ.

Verbascum thapsus, not infrequent on the dry sandhills along the coast, especially in the neighbourhood of Couderton, a little way beyond our limits to the south. *Scrophularia nodosa*, "Stinking Roger," a plant of considerable repute among our local medicine men, may frequently be encountered on rubbish heaps by the shore. *Digitalis purpurea* ; a stately and handsome plant, like the Daisy, Buttercup, and Bluebell, calling up reminiscences of our earliest wanderings by copse or hedgerow, wanting only to be a native of Mexico or the Burman empire to qualify it for becoming a florist's treasure. *Linaria elatine* ; reported by Miss Glaister as growing plentifully at Pow Hill, Kirkbride. *L. vulgaris*, "Butter and Eggs," common at several points along the shore ; apt to spring up where recent embankments have been formed ; inland it seems to prefer deep sandy loam, and is very plentiful about Aspatria and Bullgill. *Veronica hederifolia* ; not a common species in Cumberland, but fairly plentiful where found ; seldom perhaps near the sea, yet large patches appear on hedgebanks of both sides of the highway near the bridge crossing the railway at Risehow. *V. polita*, and *V. agrestis*, closely-allied species, are not unfrequent agrestal weeds in the light sandy fields which fringe the coast ; the former is perhaps more confined to gardens. *V. buxbaumii*, not long ago was looked upon as a botanical rarity in Cumberland ; is now spreading rapidly and becoming permanently established. Several patches may be seen on the rubbish heaps carted upon the beach from Risehow to Maryport ; near the railway sheds at Aspatria it has been noticed for twenty years ; luxuriant specimens were observed last autumn about the old sandstone quarries near Stockdalewath bridge. *V. arvensis* ; this species is found in cultivated fields where the soil is light and friable, frequently too it is met with on wall tops that have been capped with turf. Its flowers are very small, but of a brilliant blue. *V. serpyllifolia* ; on rubbish heaps not in-

frequent, but subject to much variety in size and appearance in different soils and aspects. *V. officinalis*; in grassy places fairly plentiful, though neither so common nor so conspicuous as *V. chamædrys*, the lovely and brilliant azure of whose corolla forms so striking an ornament on dry hedgebanks and patches of waste ground, in which situations its distribution is all but universal. *V. montana*; not exactly a common species, though locally plentiful; in Flimby Wood it may be seen in perfection—very much resembling a sickly Germander with its colour washed partly out; this leads me to mention that in drying Veronicas for the herbarium, it is desirable to subject them to pressure with as little delay as possible, as the flowers quickly fade and drop from the stem on removal of the plant from the soil. *V. scutellata*; in appearance very unlike the rest of the family, having a weak straggling stem, with very narrow pointed leaves and pale-coloured flowers; is found chiefly about the edges of boggy pools or marshes; it grows about Salta Moss, and may probably be found wherever swamps line the coast. *V. anagallis*; not a very common, but a widely distributed species, luxuriating in deep spongy bogs or by the edges of slow-running streams. The finest examples on the coast line appear in some “soughs” between Allonby and Edderside; but these, fine as they are, must yield the palm to the gigantic specimens that flourish in the well-known Newton Reigny Moss, about three miles west of Penrith. *V. beccabunga*, better known as Brooklime, is a very common gutter-side plant, not without repute in Cumberland for its medicinal uses. *Euphrasia officinalis*; common everywhere on the shore-line as inland. *Bartsia odontides* is also a quite common species, preferring moist localities, and apparently succeeding as well on sterile clay or peaty soils as on better-class loams. *Pedicularis palustris* and *P. sylvatica*, are frequently found; the larger, or Marsh Lousewort, has leaves pinnate in form, with deeply toothed segments; these leaves disposed in the shape of a rosette, before the stem is pushed upwards, form a very pretty object. *Rhinanthus cristagalli*; “Hen-pens” is a common plant of all our meadows, not at all popular with those who formerly wielded the scythe, before

that implement was superseded by the mowing-machine; var. *major*, on the North Shore, Workington.

LABIATÆ.

Lycopus europæus; this species is comparatively rare with us, but grows by the edges of peaty pools on Salta Moss behind Dubmill. *Mentha hirsuta*; by slow-running ditches very prevalent; many a time when fagged and weary with a long day's tramp, have I felt refreshed by the powerful odour of its leaves when crushed in the hand. *M. arvensis*; often too prevalent in foul crops; its odour is not unpleasant, though not nearly so pungent as that of the Horsemint just mentioned; the dried leaves, when powdered, are sometimes used as a seasoning in black-puddings. *Thymus serpyllum*, common on dry banks along the entire coast line; bees seem very fond of it. *Calamintha clinopodium*; another xerophilous species, not unusual, though far less abundant than the wild thyme. *Nepeta glechoma* appears but rarely in proximity to the shore; a few plants in a hedge bank near Flimby Post Office. *Prunella vulgaris*, common in heavy soil, and on waste banks; also on sterile or poorly farmed pasture ground. *Ballota nigra*, in old lists reported from Workington Marsh, where it still holds its ground, teste Rev. H. Friend. *Stachys betonica*, on hedge banks and the drier parts of meadow ground; not infrequent; largely sought after by herbalists. *S. germanica*, gathered in 1886 on the ballast heaps at Maryport; now obliterated by fresh deposits of soil. *S. palustris*, in most localities; a troublesome weed where prevalent. *S. sylvatica*, an occupant of most rubbish heaps and undisturbed corners near dwellings; a coarse-looking species, giving out an offensive odour when handled. *S. arvensis*, an annual species, of humbler growth than the other Woundworts, and less common, though locally abundant; plentiful in fields between Aigle-Gill brickworks and the shore west of Flimby. *Galeopsis versicolor* is a plant which I found growing upon upon a newly-raised railway embankment near Seaton Station in the summer of 1886; I am informed by Mr. Duckworth that it grows plentifully northward of Carlisle, in the direction of Gretna. *G. tetrahit* is almost univers-

ally distributed, and is known as the "Dead Nettle" or "Day Nettle" of the Border folks' speech. *Lamium amplexicaule* is common on the ballast heaps at Maryport; and, about Flimby, Aspatria, &c., is a common weed of cultivation. *L. incisum*, and *L. purpureum*, the "Bad Man's Posy" of Carlisle children, are both common about hedgerows and rubbish heaps. A white flowering variety of the latter species grows by the roadside between Dalston Village and the Railway Station. *L. album* is a conspicuous wayside weed from Maryport to Whitehaven and further. *Ajuga reptans* is also common in moist shady spots; nowhere have I seen it in such abundance as in Flimby Wood. *Teucrium scorodonia*, though properly a plant of the hills, is yet abundant in some of the dry sandy hillocks near the shore in the neighbourhood of Harrington, &c.

BORAGINACEÆ.

Echium vulgare; appears along the shore at intervals; the most considerable patch is found on the beach behind the slag-bank at St. Helen's Colliery, on the Workington side, where *Glaucium luteum* also is conspicuous; I find no mention of these plants in the lists of the late Mr. W. Dickinson, F.L.S., of Thorncroft; or the late Mr. D. Tweddle, of Workington, both of whom were diligent observers, and lived many years in the immediate neighbourhood; the absence of all mention by them of the existence of two such remarkable plants, justifies the assumption that their establishment is of comparatively recent date. *Mertensia maritima*; the Rev. John Harryman, early in the present century, reported the occurrence of the "Oyster plant," as it is called, between "Maryport and Workington, sparingly;" the remark still holds good; but perhaps *very sparingly* would better represent the present state of affairs; at Coulderton, Parton, and elsewhere, it has been observed; but never in any great abundance; it is a lovely plant, with deep green glossy and fleshy leaves, and flowers of brilliant azure tint; the whole plant turns black in drying. *Lithospermum arvense*; one of the rarer plants of Cumberland; a weed of tillage, of which I found several specimens in

a cornfield at Waterloo-terrace, Flimby, in the summer of 1886; the field had not previously been ploughed out for many years. Of the *Myosotis* or "Forget-me-not" family, four species may be found in the vicinity of the shore-line; these include *M. palustris*, the Forget-me-not proper, in brooks and ditches; *M. repens*, also a dweller by the water brooks; *M. arvensis* and *M. versicolor* on drier banks; other species are found inland. *Anchusa arvensis*; this hirsute plant, which at first sight might be mistaken for *Echium vulgare*, is fairly common in light sandy ground all along the coast from St. Bees to Silloth, at which latter station, as well as about Allonby, it is plentiful. *Symphytum officinale*, as a waif from cultivation, is found about Parton, Harrington, &c.; at Flimby I have seen it along with *S. tuberosum*, in the garden of a herbalist; I suspect that neither of them has any strong claim to be classed among our indigenous plants. *Asperugo procumbens* has appeared in three successive seasons, 1885-86-87, on heaps of household- and garden refuse deposited on the beach near Maryport; it is a low, creeping plant, with very minute purple flowers; the stalks are square, with sharply defined edges, and the entire plant is rough to the touch.

PINGUICULACEÆ.

Utricularia vulgaris; this rare plant is found plentifully in the Old Reservoir at Maryport, which was formerly the ancient bed of the River Ellen; since the establishment of water-works in the town, the volume of water in the reservoir has considerably diminished; owing to that, or to some other cause not rightly ascertained, the number of flower spikes has become inconsiderable, although the curiously-shaped floating stems are to be seen in plenty. *U. minor*; rows in a "sough" at Dubmill; but during the recent dry season its existence was grievously imperilled by the drought; the same remark is applicable to *Hippuris vulgaris*, which is associated with the Bladderwort; I never saw the latter plant in flower at Dubmill; in the herbarium of the late Mr. Dickinson is a dried specimen in bloom, labelled "Bog near Carlisle—per T. C. Heysham, Esq." Query—What bog is here meant?

PRIMULACEÆ.

Primula vulgaris, and *P. officinalis*, the Common Primrose and the Cowslip, are familiar to every child; the former is often seen close to the shore, the latter more rarely. *Glaux maritima*; abundant in salt-water marshes and by the edges of creeks, as the Cloffocks at Workington, Whitrigg and Skinburness marshes, &c.; the finest examples I have seen grow on the beach about Anthorn and Cardurnock. *Samolus valerandi*; much less plentiful than the foregoing; I have seen it on the beach near Coulderton, where a little rill empties into the sea; and again under similar circumstances a little to the west of Bowness-on-Solway.

PLUMBAGINACEÆ.

Armeria maritima; along the entire coast of Cumberland this plant, known locally as "Thrift," flourishes abundantly; nowhere is this more apparent than in the northern section, say from the mouth of the Ellen to Rockcliffe Marsh; near Cardurnock acres of it may be seen. *Statice limonium*; grows sparingly in the neighbourhood of the Solway Viaduct; also in salt marshes near St. Bees. *S. binervosa*, another form of Sea Lavender, is reported from the rocks at St. Bees Head, and is probably the same plant with that found at Fleswick, mentioned in the Whitehaven Catalogue in Vol. VI. of the *Transactions*.

PLANTAGINACEÆ.

All five British species of the Plantains are to be found at different stations along the shore; in addition to which I discovered an alien of the same group, *Plantago arenaria*, associated with *Adonis autumnalis*, in a crop of flax on the Woodside farm, Flimby, in 1884.

CHENOPODIACEÆ.

Salsola kali; on many parts of the coast, frequent; a prickly plant, not unlike a seedling Whin; the young sprouts are some-

times preserved in vinegar, and in that form are locally known as "Parton Pickle;" a wanderer, so to speak, among plants, it has a habit of disappearing for years from stations which it previously occupied. *Salicornia herbacea* is also subjected to the same treatment as the preceding, and is called by the operators "samphire"—not to be confounded with the Samphire of Shakespeare, which, in these parts, grows only about the cliffs at St. Bees Head. *Salicornia* has been found at Ravenglass, Workington, near the Grune Point, Skinburness, and at Cardurnock, on the opposite side of the Wampool estuary. *Beta maritima*; on the rocky shore near Parton, not plentiful. This plant has appeared in considerable numbers among heaps of ships' ballast near Maryport harbour in 1887; where the ballast came from I have not been able to ascertain; from the many loose fragments of slate rock scattered about, I am inclined to think that it came from some Welsh port. *Chenopodium album*; the "meols" or "myles" of cottage gardeners is everywhere abundant; the var. *b. viride* gathered on household rubbish on the beach at Risehow. *C. urbicum*; a single example met with on the ballast heaps at Maryport in 1886. *C. rubrum*; associated with the foregoing; the ground is just now being covered with fresh layers of ballast, and the plants may be looked upon as exterminated. *C. bonus henricus*; about most of the old villages, hamlets, and farm tofts along the coast; formerly in culinary request, but now superseded by Spinach. *Atriplex littoralis*; associated with *Beta maritima*, *Mercurialis annua*, &c., on the ballast heaps already referred to; it has also been reported from the sea shore at Parton, by the Rev. F. Addison, formerly of Cleator. *A. angustifolia*, and *A. deltoidea*; both on the beach at Risehow and Maryport; the former is a common agrarian weed in many parts of the county. *A. triangularis* is mentioned in the Whitehaven Catalogue as occurring at St. Bees; possibly a mistake for *deltoidea*. *A. babingtonii*; this species has been observed at different stations on the coast, as at Coulderton, Lowca, Flimby, and Allonby; at Flimby the inroads of the sea seem to have exterminated it; it grows with those already mentioned about Maryport. *A. arenaria* is, to all

appearance, on the coast line, the most widely-distributed member of the Orache family,⁴ being found at Silloth, Allonby, Maryport, Workington, and St. Bees.

POLYGONACEÆ.

Rumex nemorosus, var. *b. sanguineus*; this Dock is far from uncommon towards the western coast line. I have seen it about St. Bees, Workington, Seaton, Flimby, Broughton, Maryport, and Old Mawbray; the characteristic bloody veins are more distinctly traceable in the root leaves in early spring, than in those of the stem at a more advanced stage of growth. *R. obtusifolius*; the Common Dock, so well known by farmers as a pest, haunts the shore, as well as the inland part of the county; it is, however, largely outnumbered on the beach by *R. crispus*, a fine variety of which, distinguished as *R. trigranulatus*, is quite common from Maryport to Ravenglass. *R. alpinus*; a reputed alien; grown in gardens by the butter-wives, who use its fine large leaves for the purpose of keeping their pounded butter cool in hot weather; is sometimes found in a half-wild state. *R. acetosa*, "Sour Dockin'," and *R. acetosella*, "Sheep's Sorrel," are both quite common; the latter luxuriates on the turfy soil of newly-reclaimed bog land. *R. scutatus*; an alien, occasionally cultivated as a salad herb; I was greatly surprised to find patches of this plant growing at the foot of the rocky bluffs that overlook the sea a little on the Whitehaven side of Harrington; how it came there, except through the agency of birds, I was at a loss to imagine; the fondness of linnets, finches, &c., for the seeds of the Common Sorrel I had frequently noticed, and I was fain to accept this theory as a probable solution of the puzzle. *Polygonum jagopyrum* is a plant which I have only met with about the docks at Silloth, imported by ballast as at Maryport. *P. convolvulus*, and *P. aviculare*, are both quite common; the former, as Black Bind Weed, has a bad habit of twisting itself spirally round any plant within its reach, and thereby seriously impeding its growth. *P. raii* resembles an overgrown, or luxuriant, type of *P. aviculare*, with long procumbent stems; it is, however, readily distinguishable

by its smooth and shining, concave-sided fruit. *P. hydro Piper* appears sparingly by the side of ditches and brooks where they empty into the sea, but is mostly an inland plant. *P. persicaria* and *P. lapathifolium* are common occupants of rubbish heaps; but the former, under the name of "Redshanks," is a sad pest to the tiller of undrained land in the Lake District. *P. amphibium*, very fine examples may be seen in a long narrow pool on the beach near Bank End farm, Maryport; also in the reservoirs belonging to the West Cumberland Iron Works, Workington; at this latter station it blooms somewhat earlier than usual, owing probably to the high temperature of the water, which is constantly tepid.

EUPHORBIACEÆ.

Euphorbia helioscopia, commonly known as "Wart Grass," from its supposed efficacy in the removal of warts. The acrid yellow juice of the plant is employed for this purpose, being applied externally; and I well remember a neighbour of mine some twenty years ago, who suffered severe pain from incautiously rubbing her eyes with her hand after doctoring a child's knuckles with the juice. *E. paralias*, on the shore at Harrington, Haverigg, and Flimby; at the latter station it has been swept away by encroachments of the sea. *E. portlandica*, on the shore about Drigg, Braystones, and Coulderton, sparingly. *E. peplus*, a common garden weed at Flimby, and on friable soils at several stations inland, notably about High Lorton. *Mercurialis perennis*, an abundant species, growing in woods and shady hedge-banks, and making its appearance early in the season—poisonous. *M. annua*, very rarely found in Cumberland, and doubtfully indigenous; has appeared since 1884 on the ballast heaps at Maryport; not poisonous, like the preceding, and has been used as a vegetable in cooking.

URTICACEÆ.

Urtica dioica, the common Stinging Nettle, is one of the best known plants of England, sure to be found wherever man has taken up his abode. *U. urens*, Annual Nettle, not so ubiquitous

as the preceding, but sufficiently common ; both species are in use by cottagers in the preparation of "nettle broth," in early spring, when "pot greens" are scarce.

AMENTIFERÆ.

Passing over the Oak, Chestnut, Beech, Alder and Poplar as timber trees, and hardly within the scope of the present inquiry, I may just mention that *Myrica gale* is found close to sea level at Salta Moss, Dubmill, and also on Bowness Moss ; at the latter station in great abundance. Coming to the Willows, which are well represented in West Cumberland, I may particularise the following as occurring close to the shore : *Salix pentandra*, *S. purpurea*, *S. rubra*, *S. viminalis*, *S. smithiana*, *S. cinerea*, *S. aurita*, *S. caprea*, *S. nigricans*, var. *andersoniana*, *S. repens*, with vars. *fusca* and *argentea*.

TYPHACEÆ.

Sparganium ramosum and *S. simplex*, two species of the Bur-Reed, may be seen side by side in the Old Reservoir at Maryport, and in boggy ditches or "soughs" between Allonby and Edderside.

LEMNACEÆ.

Lemna minor ; this diminutive plant is common here, as elsewhere, on the surface of stagnant pools or sluggish streams, associated frequently with Watercress, Starwort, Brooklime, &c.

NAIADACEÆ.

Potamogeton natans is found plentifully in a long narrow pool forming a miniature *haff*, where a brooklet discharges its waters into the Solway Firth near Bank End, Maryport, and which has been already referred to. *P. rufescens*, quite a rare species, growing in the dam at Dubmill, and found also in the brook at intervals up to Dubstangs. *P. crispus*, in the Old Reservoir at Maryport, and higher up the river Ellen. *P. pusillus*, with the preceding, also at Bank End and Dubmill. *Zannichellia palustris*, in Old Ellen, near the Railway Sheds at Maryport Goods Station, and further up the course of the river.

ALISMACEÆ.

Triglochin palustre and *T. maritimum*; the two Arrow-Grasses grow in company on the north side of the Wampool estuary towards Cardurnock; the latter species abounds about the creeks on the Cloffocks at Workington. *Alisma plantago* and *A. ranunculoides* are both found about the peaty pools on Salta Moss; the latter is a plant of some rarity, which I failed to observe at its old station in 1887, its absence being probably owing to lack of moisture, in which it luxuriates. *Butomus umbellatus*; a small patch appears in the bed of the Wampool near Kirkbride.

ORCHIDACEÆ.

Orchis latifolia, *O. maculata*, and *Habenaria chlorantha*, are all to be met with in a boggy field near Dubmill which appears to have been reclaimed from the adjoining peat moss. *Epipactis latifolia*; in the summer of 1885 I gathered a very luxuriant specimen of this plant close to the shore at Flimby; it is, however, unusual to find it growing so near the sea.

IRIDACEÆ.

Iris pseudacorus, in moist places by the edges of pools or rivulets near the sea; not infrequent.

LILIACEÆ.

Scilla nutans; the Wild Hyacinth, unlike the Snowdrop and Daffodil in a condition of nature, is frequently seen in dry situations on the bluffs that overlook the sea as from Harrington to Whitehaven; also about Coulderton and elsewhere. *Allium vineale* grows abundantly along the lower part of the valley of the river Ellen, and is found on the beach near the Dock Junction signal box on the railway near Maryport. *A. ursimum*, the "Ramps" of our local agriculturists, who hold it in abhorrence, is not usually seen close to the beach, though it appears in myriads in Flimby Wood. *Narthesium ossifragum*, a plant commonly of mountain springs, may be met with on the boggy parts of Salta Moss, also on Bowness Moss; I have not observed it farther to the south as a plant of the coast.

JUNCACEÆ.

Luzula pilosa is not infrequent, preferring shady woodland localities; it abounds in Flimby wood, where also *L. sylvatica* grows luxuriantly; about the cliffs at St. Bees it is likewise plentiful. *L. campestris* is almost universally found alike in meadow, pasture, heath, and woodland. *L. congesta*, less plentiful anywhere than the preceding, is yet widely distributed. Coming to the Rushes proper, the following species are observable in moist situations along the coast line, viz., *Juncus conglomeratus*, *J. glaucus*, *J. acutiflorus*, "Closs," very abundant. *J. lamprocarpus*, about the Wampool estuary. *J. supinus*, *J. bufonius*, *J. gerardi*, the Cloffocks at Workington; about Sellafield, teste Mr. Jos. Adair; and probably to be found generally about tidal creeks. *J. squarrosus*, extremely common.

CYPERACEÆ.

Blasmus rufus, on Whitrigg Flow, by the Wampool estuary. *Scirpus palustris*, a common species, growing about the swampy edges of lakes and tarns, is found in luxuriance by the long narrow pool (already frequently mentioned in these notes) on the beach near Bank End, Maryport. *S. cœspitosus*, Salta and Bowness Mosses, rooting so firmly in peaty soil, as to be torn up with difficulty. *S. fluitans*, floating in some of the "soughs" behind Dubmill, but not seen for the last few seasons, possibly owing to the absence of sufficient water. *S. lacustris*, the Bullrush, usually found in lakes and tarns, still grows in the ancient bed of the Ellen, at Maryport, where it seems in imminent peril of being obliterated, as the pool is gradually being filled up. *S. maritimus* has been quite recently forwarded to me by Mr. Jos. Adair, of Egremont, and was gathered near Sellafield. *Eriophorum vaginatum* and *E. angustifolium*, "Moss crops," grow in great plenty at Salta and on Bowness Moss; I have nowhere seen the broad-leaved species, which Mr. J. G. Baker thinks ought certainly to be found.

CAREX (Sedge Family).

I will for the present content myself with an enumeration of the species noted at Salta Moss or the sandy beach from Workington

to Dubmill, during the summer months of 1885-6-7. These were *Carex pulicaris*, *C. disticha*, sive *intermedia*; this latter species grows in a field on St. Helen's farm, Workington, and on the left of the footpath leading from Maryport to Bank End, near the Rifle-Butts. *C. arenaria*, everywhere rooting in the sandhills on the coast, its long creeping roots, with those of *Psamma arenaria*, *Elymus*, and *Triticum junceum* being very serviceable in preventing the sand from being blown about by the wind. *C. vulpina*, where a brook enters the sea near the extreme south of the cliffs at St. Bees, scarce. *C. stellulata*, *C. remota*, *C. ovalis*, *C. vulgaris*, *C. glauca*, "Pry," *C. panicea*, *C. binervis*, *C. fulva*, *C. flava*, *C. hirta* (Flimby Railway Station), *C. paludosa* (mouth of the Ellen), *C. ampullacea*. Where not otherwise specified, all the above forms may be found on Salta Moss.

GRAMINA (Grasses).

Having already treated at some length of the Grasses of Mid-Cumberland in a paper read at the Annual Meeting at Workington in 1882, which appeared in Vol. VI. of *Transactions*, pp. 31—46, I propose but briefly to notice some types or species not included in that list. The first of these is *Setaria viridis*, which I found last summer, growing upon the ballast heaps south of Maryport Docks. *Phalaris canariensis*, growing plentifully among household rubbish deposited at the same station, and apparently owing its introduction to bird-cage sweepings. *Alopecurus agrestis*, a worthless alien, the "Black Bent" of agriculturists in the midland counties; I have observed this grass on several occasions at Risehow, Maryport, and Silloth; its permanent establishment here is hardly probable, and certainly not desirable. *Agrostis spica-venti*, a very elegant species, though possessing slight claims to utility, has been gathered on the ballast about Maryport and Silloth Docks. *Avena fatua*, found on the North Shore at Workington; is also reported from Sellafeld and stations further south. *Catabrosa aquatica*, in a boggy ditch near Dubmill. *Bromus secalinus*, ballast hills, Maryport. *Triticum acutum*, on the sandy beach from Siddick to Risehow; common, and apparently quite indi-

genous. *T. pungens* appeared in two or three patches on the ballast near Maryport last summer, but fresh ballast having been lately spread over the place, it is probably obliterated. *Lolium italicum*, var. *ramosum*; of this luxuriant development of the Rye-Grass, several specimens have been gathered at Risehow and Maryport; from the surroundings in both instances, I conclude that powerful stimulants of a manurial kind tend to produce this striking deviation from the type; at Risehow it grew where the sewage from neighbouring dwellings flows out upon the open beach, and at Maryport the fibrous roots were in immediate contact with night soil scattered among household refuse. *Elymus arenarius* is rapidly becoming established on the North Shore at Workington, between the Lonsdale Dock and high-water mark. *Hordeum murinum* once grew on the Maryport bent-hills, and along the beach in the direction of Flimby and St. Helen's; the bent-hills are now covered with unsightly slag mounds from the iron furnaces, whilst at Flimby the encroachment of the sea in late years has led to its destruction—a stray plant may now and then be discovered, but practically it may be looked upon as annihilated.

FILICES.

The neighbourhood of the coast seems hardly so congenial to Fern life as the gills of the Lake District; yet even here fern-hunters are gradually extirpating many species that were once quite common. Even during the extreme drought of the past summer, at both Carlisle and Flimby I observed whole baskets being carried off at a period when the successful transplantation of the ferns was impossible. Only a few weeks ago, within seven miles of Carlisle, I was grieved to find one locality, where I gathered my earliest beech fern, stripped to the very last frond. Will anyone, therefore, and especially any member of an Association like our own, consider it out of place to withhold information as to the locality in which a lover of plant life may have discovered anything rare, whether among ferns or flowering plants? I will, therefore, in treating of seaside ferns, refrain from noting any new station, but be content with mentioning such as long have been public property,

as referred to in local guide books, &c. *Pteris aquilina*, grows on almost every dry hillock which tillage has never interfered with. *Lomaria spicant*, not infrequent, but, unlike the preceding, prefers moisture and shade. *Asplenium ruta-muraria*, seldom met with along the coast, and there only rooting in the crevices of the drier rocks, apparently preferring the limestone inland to the Carboniferous sandstone that abuts upon the beach. *A. trichomanes*; the remarks on the preceding species are equally applicable to the present, which is also frequently seen among the slate rocks of the lake hills. *A. marinum*, frequent among the crevices of the cliffs at St. Bees Head. *A. adiantum nigrum*, on dry hedge-banks at intervals along the coast. *Athyrium filix-femina*, both the typical form and the var. *rhœticum* abound in moist localities. *Scolopendrium vulgare* is found luxuriantly at the base of the cliffs at St. Bees, where trickling rills approach the high water line; is also not infrequent in gills that open upon the coast; varieties with bifid or trifid fronds are not uncommon. *Aspidium aculeatum*, not uncommon in shady and secluded nooks. *A. angulare* also holds a place in a ravine that I well wot of. *Nephrodium*, or *Lastrea filix-mas*, the ordinary Male Fern, is one of the commonest of the tribe; it is the "Meckin" of the dalesmen, as distinguished from the "Breckin," *Pteris aquilina*,—the only sorts recognised by the unlearned; the var. *borreri* is far from uncommon. *N. spinulosum* is reported from the neighbourhood of Whitehaven, probably along the St. Bees line of rocks. *N. dilatatum* is a fairly common species; some four or five years after the opening of the Solway Junction Railway, I was interested to notice the way in which this fern was becoming established about the edges of the open cuts made for the drainage of the line, even in the deepest part of Bowness Moss. *N. æmulum*; I have been shown living specimens of this fern which were brought from the St. Bees cliffs; I have never seen the plant *in situ*. *N. oreopteris*, an abundant species in the valleys of the Lake District; is also to be found on the coast at St. Bees, Maryport, Salta, and elsewhere. *Polypodium vulgare*, common on walls, tree stumps, etc., throughout the district. *Osmunda regalis*, known in some places as the "Bog Onion," has

long been the object of systematic and relentless plunder, and has been obliterated entirely from many erewhile noted stations; it is doubtful if we may ever again see potatoe carts covered with its fronds, for the protection of the vegetables from frost during their transit to market, as was quite a common occurrence at Whitehaven and Egremont within living memory. *Ophioglossum vulgatum*, the common Adder's Tongue, I take to be much more plentiful than is commonly supposed, being quickly shrouded from observation in meadows by the surrounding vegetation, and cropped by cattle in ground devoted to grazing purposes. *Botrychium lunaria*, the last in our list of Ferns, is found within a stone's cast of the beach at different stations; a few plants had the temerity to spring up on Flimby Green, close to the houses, in 1886; I expect they were quickly removed, for I saw no trace of them in 1887.

LYCOPODIACEÆ.

The Wolves' Feet being natives of the hills, form no part of seaside vegetation, though I have met with one of their number, *Lycopodium selago*, at Salta.

EQUISETACEÆ.

Equisetum arvense, "Paddock Pipes" and "Tead Pipes" of the husbandman, is abundant wherever moisture prevails; on newly-formed railway embankments the female spikes are conspicuous objects in April and early May. *E. maximum*, abundant on the coast near Braystones, St. Bees, Harrington, Flimby.

THE HISTORY OF THE EDEN AND OF SOME RIVERS ADJACENT.

BY J. G. GOODCHILD, H.M. GEOLOGICAL SURVEY.

*Based upon an Address given before the Carlisle Society, at Nunnery Walks, in August, 1880.**

AFTER giving an outline of the various natural processes, which, separately, or in various combinations, have given rise to the present features of the earth's surface, the paper treated in some detail of the three old plains of denudation to which most of the larger features of the topography of the North of England are capable of being referred. These plains are (1) the First Plain, or that fashioned out of the Older Palæozoic rocks, whereon the Carboniferous strata were spread out. (2) The Second Plain, which formed the (somewhat irregular) surface that received the New Red. (3) The Third Plain, represented by the denuded

*The original address was entitled "An Outline of the History of the River Eden." A few days after it was delivered, reports, containing the chief points in it, were published in several of the Cumberland and Westmorland newspapers. Reprints of the fullest of these reports were sent to many of our leading geologists, as well as to the principal scientific institutions; so that the main conclusions stated in the article referred to, were pretty generally known, and were actually published, years ago. Being urged by several members of the Cumberland and Westmorland Association to insert the paper in our *Transactions*, I have thought it better under the circumstances to re-cast it entirely, rather than to re-print it in its original form. The introductory matter has been given in abstract, and some additional passages have been added. But it will be seen that the arguments and conclusions remain as they were in the "edition" published in 1880.

surface whereon the Upper Cretaceous rocks were formed. Each of these plains coincides with an important unconformity. The First Plain, for example, coinciding with a break equal in extent to a thickness of five miles of strata, which had been removed by denudation long after the Ludlow period, and yet prior to the commencement of the Carboniferous epoch in the North of England. (See the diagrams below).

It was pointed out that such plains may appear at the surface through a variety of causes. They may represent the final result of prolonged marine action; or they may be due, as Dr. A. Geikie has pointed out, to the action of subaerial forces, which have reduced the original inequalities of the land, in course of time, to one uniform level, that of the sea, and thus have formed what Dr. Geikie aptly terms a "base level of denudation." They may, again, owe their present position, in many cases, to the re-exposure of old plains of any age, even of such as have formerly been covered by a considerable thickness of newer strata, which has afterwards been removed by the prolonged action of natural causes.

In such cases as the last, the degree of perfection in which any such re-exposed plain may be left is related (1) to the nature and the extent of the disturbances that particular plain may have undergone in company with its immediate overburden of new rock; (2) to the ratio between the durability of the rocks forming the old plain and that of the strata—especially of their basement beds—to whose removal the re-exposure of the plain is due. Where the strata above the plain waste no faster than the rocks below, the regularity of the old floor will be destroyed as fast as it is reached by the denudants. But where, on the other hand, the beds above the plain waste at a higher rate than any part of the platform they repose upon, the newer strata recede laterally, and leave their original floor in a state of perfection dependent solely upon the total amount of disturbance that had affected the newer rocks since their formation. In the case of beds that have been upheaved with little or no resulting disturbance, a plateau may be brought to light with almost as even a contour as when it was formed originally. If the rock, again, happen to have been tilted, then

the plain will be represented by a surface sloping in the same direction, and with the same inclination, as the original dip. If a synclinal is denuded, then the plain will be represented by a trough ; just as the denuded core of an anticlinal would represent a part of the old plain bent into a ridge ; or as a quaquaversal dip would, when stripped of its newer rocks, leave behind a rock surface presenting the characters of a dome. These features are determined, of course, by the movements of date posterior to that of the original plain, and are not in any way necessarily connected with the structure of the rocks out of whose edges the plain may be shaped. For example, an anticlinal in Cretaceous rocks may often coincide with a synclinal in the rocks below, or *vice versa*.

In the original some further arguments were adduced in support of the view that the plain where Carlisle is now, extends without perceptible interruption in a south-easterly direction from the neighbourhood of that city, along the eastern margin of the lowlands of Edenside. Its characters are particularly-well displayed between Langanby and Melmerby, whence it extends for miles to the north west and south-east, with hardly any feature to disturb its uniformity. In this area, as around Carlisle, the Third Plain is shaped out of the ends of at least two thousand feet of New Red Rocks. By tracing the profile of almost any part of this plain—near Melmerby, for example—the fact becomes evident that the Third Plain, here, as elsewhere, gradually rises in the direction of the Lake District. Its slope prolonged just passes above the summit-levels of the Penrith Sandstone hills that range between Armathwaite and Penrith, which summits themselves appear to represent an undenuded strip of the old plain. Continued thence it rises a trifle above the present summits of any of the Carboniferous rocks (which are mainly calcareous) and extends thence to the level of the hill tops in the Lake District. The depressions that interrupt the continuity of the plain are exactly of such a nature as could be readily accounted for on the supposition that they are due to subaerial modifications of later date. In every case, except those manifestly due to river action, they are connected with the outcrop of some stratum more easily denuded than those adjoining.

The Plain of the Lake District fell tops (not their *slopes* anywhere, which mainly consist of re-exposed areas of the Second,- and especially of the First, Plains) can be readily identified with the plain constituted by the summit levels of the great Carboniferous uplands on the east side of the Pennine and Craven Faults. The tops of the Howgill Fells form a triangular outlier as it were, of the same feature, which even now all but meets the plain just mentioned. The northern and the western slopes of the Howgill Fells belong, however, mainly to the Pre-carboniferous (or First) Plain, and represent the denuded core of a great Post-carboniferous flexure.

Certain facts noted over a large area point to the conclusion that the Third Plain in and around Edenside has been formerly covered by a considerable thickness of newer deposits, which lay with a marked unconformity upon the denuded edges of all the strata from the Lias down to the lowest Siluro-Cambrian rocks. All the facts point to the conclusion that these newer strata lay with a remarkably-even junction upon these older rocks, and that, whatever their age, or their general nature, they were much-more easily wasted under subaerial denudation than even the softest of the strata that formed the platform whereon they once reposed. The only strata known to bear this kind of relation to rocks of the age mentioned, are the Upper Cretaceous. Possibly the Upper Greensand, the Chalk, and some of the Eocene strata may have formerly covered the whole of the North of England, and have connected the Later Neozoic rocks of Ireland with those now left in East Yorkshire. Many circumstances favour the conclusion that such was the case.

The remarkable evenness of junction between the Cretaceous rocks and the surface of any older strata upon which they may happen to lie has long been noticed. It is well seen along the south coast of England where the Cretaceous beds are overstepping one after another of the Neozoic rocks as they trend westward into Devonshire. It is said to be the same in East Yorkshire, and in the North of Ireland, It is, again, very clearly shewn where the Cretaceous rocks of Belgium cut across the Carboniferous and

older rocks. *Vide* Coal Commission Reports, and also Prestwich's "Geology," II, fig. 44.

We can easily fill in the details of such of the later events as bear upon the subject under notice. We know that in late Tertiary times, the whole of western Europe underwent more or less disturbance and upheaval—probably as one of the manifestations of that subterranean energy that gave rise to the great Tertiary volcanic outbursts of Antrim, the Western Islands of Scotland, Iceland, &c.* The waning of this important episode was marked by some important upheavals, which affected large areas all over the Kingdom. There is abundant evidence that these upheavals were by no means uniform in amount over large areas. Far from that. The upheavals nearly everywhere were marked by differential movements, certain zones or tracts of country rising to a higher level by two thousand feet or more than other zones situated only a few miles off.

The Lake District formed one of these independent (or nearly independent) areas of upheaval, as it was raised as a broad anticlinal, whose axis passed through the Howgill Fells to Borradale. A second anticlinal running nearly at right angles to this, extended through Sca Fell Pikes and the Caldbeck Fells, dying out gradually as it passed through Penrith. Parallel to this last axis of upheaval ran the synclinal axis now occupied by the Solway. (I believe it possible that Chalk may exist even yet in the deeper parts of the Irish Sea off West Cumberland, or may even occur inland, between the drift and the New Red in the lowlands north-west of Carlisle.)

Along the old belt of disturbed and fractured rocks known collectively as the Pennine and Craven Faults, differential movements had again and again occurred in various earlier geological periods. It is therefore no more than might be expected, that movements of the same nature should recur at the period specially under notice. So it happened that, while the strata as a whole were undergoing more or less upheaval, those on one side of the

* See Dr. A. Geikie's *History of the Tertiary Volcanic Period in the British Isles*. Trans. Roy. Soc. Edin., Vol. xxxv., pt. 2.

Faults should be lifted higher than those on the other. The base of the Cretaceous rocks here was raised to only a few hundred feet above the sea level on one side of this great line of weakness, while on the other it rose in places to a higher level by more than two thousand feet. Thus the last great movement of the Pennine Fault was caused. And thus, and at that time, were upheaved the *massifs* out of which denudation has since carved our valleys and dales, leaving the portions undenuded as our hills and mountains.

It cannot be too often repeated that, not a single mountain now existing as such had come into existence at the period we are now now considering. In every case the mountains of North Western England are due to the unequal lowering of the old plateaux, whose history has just been sketched; and this has been effected entirely by the conjoined action of rain and rivers, acting slowly and gently through untold millions of years. It is also important to remember that the rivers in every case are older than the mountains. Even the Eden itself is probably older than the Alps, the Himalayas, the Andes, Vesuvius, Etna, or almost any mountain now existing as such. It is not intended, of course, that the *rocks* forming the mountains around Edenside are not of great antiquity—quite the contrary—but we are dealing with their form, and not with their history as a whole. The great depression of Edenside (the so-called Eden Valley) had no existence until much later. The excavation of that marked feature of Cumberland and Westmorland, and consequently, the development of the steep edge of the Carboniferous uplands to the east of it, did not even commence until a very late period in the geological history of the North of England. It is, in fact, in process of further development at this very moment. So far from Edenside having always been an area of depression, the anomalous behaviour of the rivers in and around it can only be explained on the supposition that, at the time those rivers began to flow the whole of that area was filled to a higher level than any of the present mountain tops by rocks of some uniform character, which formed a surface whose highest ground rose far above that of any of the areas adjoining.* The central

* It does not follow that the absolute elevation of this part was then much higher than at present; but some part of the present elevation is almost certainly due to movements of later date than most of the principal valleys.

line of watershed at the time the Eden and its associated rivers began to flow would seem to have been somewhere along a line joining, say, Penrith and Kirkby Stephen, and the drainage flowed away from this zone to every point of the compass—The Eden, The Tyne, The Tees, The Yore, The Swale, as well as The Derwent, The Esk, The Kent, and The Lune, all rose here.

But at that time the greater part of the rock forming the whole surface of these parts was of such a nature as to waste at a faster rate, even than the comparatively-soft beds of the New Red. Consequently, some time after the river-courses were quite established, the general denudation, always in progress, had lowered the surface sufficiently to expose, first the core of the Siluro-Cambrian rocks forming the Lake District, and, next, the higher parts of the Carboniferous framework adjacent to that on the east and the north-east. Important modifications of the river courses ensued. A further lowering of the surface gradually developed more and more of the Lake District and more and more of the Carboniferous uplands; until, eventually, even the higher-lying parts of the New Red appeared through the rapidly-wasting cover of newer rocks. (See fig. 4, pl. 1.) By the time this stage was attained, the rocks then forming the basin of the Eden presented very considerable diversities in their powers of resistance to atmospheric waste. Frost and thaw, rain and drought, heat and cold, affect all rocks more or less, and constantly tend to reduce them to a transportable form ready for their removal by the rivers, and their rearrangement beneath the waves of the sea. But rocks do not all yield alike: some may waste at even four or five times the rate that others do. Putting this ratio into figures, for the sake of illustration, we might say with regard to the rocks of the basin of the Eden, that the (now vanished) Cretaceous and Tertiary rocks wasted in a thousand years at the rate of *one foot*; the New Red at *nine inches*; the Carboniferous *six inches*; and the Siluro-Cambrian rocks generally at *three inches* during the same time. (In regard to the last mentioned rocks, the Skidda Slates weathered at a higher-, and the Coniston Grits at a lower rate than the general average of the whole.)

It would be obvious, from a consideration of these facts, that a watershed formed of rocks wasting at the rate of one foot in a thousand years could not maintain its position if the rivers flowing from it traversed likewise strata whose average rate of removal amounted to only about half that quantity. A stream flowing from Appleby northward across what are now the Pennine Uplands maintained its course unchanged while the whole of it lay through rocks of uniform character. But as soon as the general lowering of the surface brought about the exposure of the older rocks—say, on Dufton Fell, then the course of the river must have been at once affected, for the softer rocks of Edenside wasted twice as fast as those of the newly-exposed Carboniferous rocks adjoining. (See fig. 3, pl. 1.) If I am correct in my inference that Maize Beck, for example, rose near where Cliburn is now, then the lowering of the surface there must, after a time, have proceeded at a rate so much more rapid than it did to the North of Dufton Fell, that the head of the river must soon have fallen to a lower level than that of the hause, or *col*, between Maize Beck and Haikable (“High Cup Gill.” The stream must consequently have been severed in two along the line where the softer strata had joined the harder. Maize Beck flowed on from then till now without important deviation; while the water collecting in its severed upper portion started anew, as it were, and, following the law of gravity, turned westward down the newly-formed declivity, and flowed into Edenside.

I have little doubt that at one time all the rivers mentioned above, and—most especially—the Westmorland Lune, took their rise near Appleby, and that they have since had their several courses abbreviated by the diversion of part of the drainage in other directions consequent upon the differential lowering of the surface where they formerly originated.

The same thing happened with some of the rivers of the Lake District. The Greta (at Keswick) once rose, if I am not mistaken, near Penrith, and it is only because the rocks that were formerly on the Penrith side have wasted more rapidly, that its head-waters have been tapped and diverted into other channels. Still, the old

valley that it excavated, and that it occupied for so long, remains to this day, as an eloquent witness of the former magnitude of the Greta. Other rivers of the Lake District have had much the same history. I have already noticed the curious history of the Petteril in this connection.* In this river an additional complication was introduced in the shape of two transverse channels developed across the old river course along the outcrop of easily-wasted rocks, thereby cutting the river itself into *three*, and letting off the water in new directions.

Up to a certain point rivers are able to fret their way across an escarpment *pari passu* with its own rate of development, provided that the rate of durability of the stratum forming the escarpment does not differ very greatly from that of the less durable strata above and below, to whose higher rate of waste its development is due. But where the nascent ridge owes its development to the weathering of strata whose relative durability is very low, such a ridge tends to develop, first, into a barrier across the river, and, eventually, into a new watershed, the severed parts of the old stream then flowing away from that ridge in opposite directions, and leaving an inosculating valley as a record of this part of its history. The sequence of events that have given rise to inosculating valleys in this district finds its parallel in many other areas of mountain drainage where the rivers have traversed rocks whose several rates of destructibility have varied greatly.

Another point of interest bearing upon the history of the Eden is the great variety in the character of any given valley, according to the nature of the rocks it traverses. The formation of a river-valley is dependent to a much greater extent upon waste of the surface by subaerial causes aided by the transporting action of the river than by the direct erosive action of the river itself. Subaerial denudation acting alone, affects the whole surface, constantly tending to reduce all inequalities to the general level of the sea. Its action, like that of the sea, may therefore be regarded as mainly lateral. Rivers, on the other hand, by removing the material detached by weathering, tend to facilitate the destructive

* Trans. Cumb. and West. Assoc., No. XIII. p. 89.

action of the subaerial forces to a greater extent in the parts immediately adjacent to their courses than they do at a greater distance. Moreover, the seaward transportal of the degraded material helps the rivers in many ways to erode their own beds. Thus, on the whole, the general tendency of rivers is to cut vertically, and to deepen the valleys they occupy. Where the effects of weathering upon the rocks are at a minimum, the rivers have it all their own way, and the square-cut channel resulting from their unaided action is left with hardly any modification. Magnificent examples are presented by the cañons of Colorado. In the few cases where the rate of vertical erosion effected by the river and the lateral erosion of the rocks under the action of the weather are equal, banks are left with slopes of 45° .* More commonly, the rate of weathering near a river exceeds the rate of vertical erosion, and a valley with sides enclosing a very wide angle is the result. But in every case the nature of the rocks affected is apt to produce important modifications of detail.

We will now pass from general considerations to review some of the minor details bearing upon the history of the rivers specially under notice.

If we follow up nearly any stream flowing into the Eden, carefully noting the variation in the form of its valley from point to point, we shall find, in nearly every case, that although the actual size of the valley may be very small where the stream flows through the New Red, yet when we reach its higher parts where its course traverses older and harder rocks, the valley expands into one of much-more striking proportions. The valley of Dale Beck, which extends upwards from Nunnery Walks to Croglin Fell by way of Renwick, is a good case in point. We find that in the lowlands of Edenside, where its course lies through the New Red, the valley is a shallow channel, whose depression below the general level of the adjoining surface is hardly perceptible from a little distance. But where the same stream flows over the rocks that form the Escarpment, it widens out into one of the largest valleys along the whole fell side. The explanation of this apparent anomaly is that

* Upon this point see a paper by the writer in *Geol. Mag.* II. Vol. 2, p. 325.

Dale Beck, below Renwick, flowed in earlier times through a channel consisting of rocks whose lateral waste under the action of the weather proceeded at a much higher rate than the vertical lowering of the surface effected by Dale Beck itself. Consequently, before the New Red was reached, the old banks of the stream wasted so fast as to be removed by subaerial denudation almost as fast as they were formed. When the Third Plain supporting these newer rocks was laid bare, the stream found itself in a channel whose ratio of lateral to vertical waste was much more nearly equal. Along the Escarpment the course of the stream has lain, for a very long period, through rocks whose lateral waste is lower still. Consequently much more of the sides of the valley there has been left. The valley of Dale Beck above Nunnery Walks would have been at the present day well on to two thousand feet in depth, and several miles in width, if the rocks it traversed there had been of as durable a nature as they are along the upper part of its course.

The Eden, again, supplies another illustration of the same fact. At Nunnery Walks, and for some distance above and below, its channel happens to be somewhat larger than usual. But if its valley here be compared with that at Wetheral, a marked difference is at once apparent. There we find the river flowing in a square-cut groove, whose sides descend to the river-bed abruptly from the general level of the Carlisle Plain, without any marked declivities intervening. This comparative shallowness of the valley itself characterises the course of the Eden from its mouth up to Nateby, above Kirkby Stephen. Beyond that point the course of the river lies through Carboniferous rocks, tough and durable indeed as compared with most of the New Red. Yet although the volume of water flowing here is usually so small that one can generally ford the river without serious difficulty, the valley wherein it flows is one of the finest in Westmorland; it is three miles or more from side to side, and in places well on to two thousand feet in depth.

Take the Eamon, one of the most important tributaries of the Eden, as an illustration of another feature of interest, intimately connected with the history of the Eden. This we will trace from

its source. The drainage of the great depression enclosed by the Matterdale Fells, Helvellyn, Fairfield, and High Street gathers in Ulleswater, and eventually flows thence by way of Poola Bridge, where the outflowing stream received the name of the Eamon. In truth, however, the Eamon rises in the mountain tops around Patterdale, and Ulleswater is nothing more than a local expansion of the upper part of the Eamon, which has been somewhat widened, and deepened, by glacial action. The Ulleswater depression is, simply, the upper part of the Eamon valley. Below Poola Bridge the river cuts across the big escarpment of the Mountain Limestone, which extends across from Askham to Penruddock. If we could fill up the gap (or only a little of it) that the river has made in excavating its channel through this escarpment, the stream could easily find an outlet past Dacre, Hutton, and Troutbeck, and thence down either the valley of the Cawda to Carlisle, or down that of the Greta to Keswick and Cockermouth. The rocks along much of this line are more easily eroded than are those through which the river now frets its way. After traversing this limestone escarpment the river reaches another transverse depression. A dam a hundred feet in height thrown across the Eamon just above Skirsgill, would turn the whole of the water north-westward into the Petteril below Catterlen. Nevertheless, the Eamon has not taken advantage of this easier course open to it, but has continued its course, without any important deviation, right across a second escarpment, formed in this case by the Penrith Sandstone. Thence it flows into the Eden. The valley of the Eamon below Penrith is nearly three miles in width, and is nearly five hundred feet in depth. Clearly, these gorges represent the least-modified parts of the old river valley, and the depressions that traverse the river valley elsewhere represent such parts of the surface as have been lowered by subaerial denudation at nearly or quite the same rate as the river has lowered its own channel. When the Eamon began to flow, its course was at a higher level by more than two thousand feet than it is at present. As the general level of the surface has been lowered by prolonged atmospheric waste, the river has maintained its present course, without being in any way influenced by

those transverse depressions which have resulted from the more-rapid lowering of the surface where the rocks happened to waste at a faster rate than those around.

What is true of the Eamon is true also of the Eden. Both rivers are part of the same drainage system, and both have practically the same history.

Another case, which throws further light still upon the history of the Eden, is presented by the (Westmorland) River Lune. Some of the larger feeders of the Eden rise close to the principal sources of the Lune, in the north side of the Howgill Fells. Both sets of tributaries flow northward down the slopes left by the recession of the Carboniferous rocks as far as Ressondale (or "Ravenstone-dale"). Here, the two sets of streams find themselves in a wide valley, which ranges at this point nearly east and west, and coincides with the outcrop of the easily-wasted rocks at the base of the Carboniferous series. The slope the rivers have just left is, in fact, part of the First Plain, tilted by the movements that have affected the Carboniferous rocks, and since re-exposed by their gradual removal. The rocks forming the slope itself, as the Geological Survey Map 98 N.E. will shew, consist of exceedingly-tough Silurian grits and argillites, whose rate of destructibility is much lower than that of the rocks now in process of being stripped from off them. The north side of the Ressondale valley, or the banks facing this slope, consists of a limestone escarpment, formed of the same beds, and presenting the same general features, as those which meet the Eamon on its emergence from Ulleswater. Like the Eamon, this other tributary of the Eden crosses the depression formed by the softer part of the Carboniferous rocks, makes straight away for the escarpment, cuts through it, and thence, as in the other case, flows northward into the main stream. Its history is, of course, identical with that of the Eamon.

But the Lune behaves in a different manner, as I pointed out in the original paper. Arrived at Ressondale, it flows for a short distance close to the stream just referred to, and is in fact, separated from it by a barrier only a small number of feet in height. Then it turns to the west, flows *along* the Ressondale depression, instead

of crossing it as the other happens to do, receives several tributaries from the Howgill Fells, and flows as far as Teba. Here it is joined by the Birkbeck, which occupies the hollow forming the north-western continuation of the Ressedale valley. At the confluence of the two branches the Lune abruptly merges its direction of flow into that of the Birkbeck—that is to say, it turns sharply to the south—and, with that direction, enters the fine mountain gorge below Teba, and frets its way there along a rocky channel formed of some of the toughest rocks of the whole Silurian series, cuts right across the physical axis of the Lake District, and thence, away southward, across the lowlands, to the sea near Lancaster. What upon earth, it may be asked, could have led the river to take so extraordinary a course? Why did it go out of its way to carry the watershed of the Lake District right out into the comparatively-low ground north of Orton, instead of continuing that line along the highest ground, as people used to believe all watersheds went? To this question the answer has in great part already been given. Like the other rivers occurring near the Eden, the Lune began to flow at a level higher by more than two thousand feet above that of its median course. The surface, then, consisted of rock of one uniform character, whose general level (if I read the evidence aright) sloped away to nearly all points of the compass from an area situated above where, say, Morland now is. In this rock the course of the Lune and its tributaries was well-established. By the time when denudation had nearly removed this rock from the higher points, one branch of the Lune flowed southward past Crosby Ravensworth, Teba, and Lowgill; another, the present Birkbeck, flowed nearly with its present direction, but along a position three or four miles to the west; a third tributary flowed westward along a line just to the north of where the highest point of the Howgill Fells now is. In the course of long ages, the old surface (The Third Plain) here formed of tough grits, began to appear in places, through the removal of the Cretaceous rocks, more especially along the summits of anticlinal ridges, where, as it is well known, denudation in nearly every case proceeds with greater rapidity than along the synclines. (Here it is important

to repeat the principle enunciated above, that the natural result of the denudation of an anticlinal of soft rocks folded over harder is to leave the central core or arch of older rocks as a ridge, whose summit axis corresponds with the axis of the anticlinal affecting the rocks undergoing removal. Under like circumstances a synclinal will of course weather into a depression. Both of these factors tend to produce important modifications in the courses of river valleys.) In the present case the Lune had cut through the covering of soft rocks down to a surface formed, over an area of several square miles, of the tough Silurian greywackés forming the Coniston Grits. For a time the stream maintained its course through these; being, however, modified in direction to some extent along the line where the soft strata joined the harder below. But the Third Plain at this part was shaped partly out of Carboniferous rocks, which, long before, had been thrown into an anticlinal; and had been already denuded through to below their base when the Third Plain was formed. The general direction of the particular anticlinal in question being north-westerly, or from The Calf, say, to Harrop Pike. The Carboniferous beds were therefore tilted to both the north-east and south-west of that axis.

Another flexure crossed this above where Teba now is, slightly bending the Carboniferous strata downwards along a synclinal axis ranging south-westerly, or through Teba and Kendal.* The general result, so far as the present course of the Lune is concerned, was that the Carboniferous rocks enveloping the Howgill Fells tended, as fast as they were exposed, to recede towards the north the north-west and the west; and to leave behind them as they receded the old core of their anticlinal in a condition but little modified by the action of surface agencies. What is now the Ressondale depression was in fact at first developed some miles farther up the slope to the south. Progressive denudation conducted it by degrees farther and farther down the northern and the western slopes of the Howgill Fells, thereby exposing at each step more and more of the tough Silurian rocks, and removing more

* The general direction of this synclinal axis is shown on the small contoured map annexed to the present paper.

and more of the Carboniferous ; until in the end, the Carboniferous rocks on the Appleby side of the old anticlinal were completely severed from their related rocks on the side around Kendal. The channel of the Lune for some distance above and below Borrow-bridge had already cut right through the Carboniferous rocks into the Silurian grits.

A little consideration of these points, by the aid of the diagrams on Pl. I, will readily enable one to understand the sequel. The tributaries of the Lune that began by flowing into the main stream by a direct westerly course from a position corresponding to the present summit of the Howgill Fells found their way into a channel whose bank on the south consisted of exceedingly tough grits, while its bank on the north was everywhere formed of the easily-eroded Upper Old Red and Lower Limestone Shales. The north bank consequently gave way readily everywhere, and receded down the slope as fast as the dissolution of the overlying calcareous beds laid it bare. Consequently these tributaries receded further and further northward as denudation proceeded, until their present position was reached. They are indeed in process of further recession even at the present moment. The drainage of the slope left by the northward recession of the Carboniferous rocks by degrees collected into new channels, which are now Uldale, Langdale, Ellergill, Weasdale, and Bowderdale.

In the meantime the main stream north of Teba had also undergone some modifications. This, which I believe had its source originally somewhere above (i.e. at a higher level than) where Gaythorn Hall is now, became detached as the Carboniferous rocks north of Orton were exposed by the northward recession of the New Red. Apart from the lowering of its higher gathering ground from the more rapid waste of the New Red, it is impossible for any river to collect water and to flow over an area of Mountain Limestone like that. The water sinks through the joints of the rock as fast as the rain falls ; while, in addition, the northerly dip of the strata conducts the drainage well away to the north before the plane of underground saturation comes anywhere near the surface. So, with the comparatively-rapid lowering of the New

Red rocks about its source, and the uneven waste of the Carboniferous rocks south of Orton Scars, this, the main branch of the older Lune, has ceased to be a river valley. Subaerial denudation, acting upon the rocks of the old valley in a manner different from that previously affected by the river, has modified the old features more or less; but not beyond the point of recognition. Looking up to Orton Scars from Teba, it requires a good deal to convince those not accustomed to such questions, that at one time the river at their feet had its main source above the bare scars of grey limestone lying before him. Yet such, I am convinced, was once the case.

The history of the Lune is a complicated one; but is probably not more so than that of almost any other river. It merely happens in this case that the facts are somewhat more striking than usual—and perhaps, also, because the subject has been a good deal thought over.

Attempt to explain the phenomena how one may, there is no escaping the conclusion that the Lune must have begun to flow at a much higher level than any part of its course occupies at present. It is clear also that it must have commenced its course in rocks of a very different nature from any that it traverses now. No one can doubt, now-a-days, that the Lune has excavated its own channel entirely, and has carried it out by the selfsame agencies that it employs at the present day. Nor can anyone reasonably doubt that its rate of erosion in the past has been, as a rule, much the same as it is to-day. The highest rate of erosion we could claim for the river certainly does not, and probably never did, much exceed a few inches in a thousand years. Hence the valley of the Lune represents the result of steady, gradual excavation carried on through untold millions of years. The Lune as a river is older than any mountain in either Cumberland or Westmorland, for none of the mountains could ever have attained to that distinction if there had been no rivers to carve out the depressions that intersect the various uplands in so many different directions.

What is true of the Lune, applies also to most of the other rivers of North-western England, and is also true of the Eden. None

of them has always flowed everywhere in exactly the same direction as it does to-day. The course of each represents the net result of the long and varied series of changes the ancient stream has passed through in its descent from its original level to that it occupies at present. The whole face of nature has changed since the Eden began to flow. Mountains have been carved out, have been wasted away, and their materials have been spread out beneath the waves. Race after race of highly-organized beings have been evolved, have run their course, and have given place to others. And still the Eden flows on, as it will continue to flow until the whole of our mountain areas shall have been wasted down to the level of the sea.

EXPLANATION OF THE DIAGRAM.

Fig. 1. Shews the relation of the Lower Carboniferous Rocks, E, to the Upper Old Red, D, and of these as a whole to the Middle Old Red, C; and the Silurian rocks, B, and the Ordovician beds, A. (First plain.)

Fig. 2. This shews diagrammatically, the way in which the New Red and the Jurassic rocks overspread the older rocks, from the Carboniferous rocks downward. The plane of junction is the Second Plain referred to.

Fig. 3. Represents a later stage, when the whole district was covered by the Cretaceous (&c.) rocks. The Subcretaceous Plain is the Third Plain.

Fig. 4. Shews the present relation of these three plains to each other and to the larger surface features. It is intended also to shew the initial position of the watershed, together with the positions occupied at present.

EXPLANATION OF THE CONTOURED MAP.

The small map appended is reduced from the map accompanying the writer's paper on the Glacial Phenomena of the Eden Valley, &c. Q.J.G.S. xxxi., p. 55 *et seq.* It shews the distribution of the Shap Granite, and of the drifts from Galloway; and it shews also some of the chief glacial striæ, whose direction is shewn by that of the short line passing through a small ring. The old lake basins of Edenside are shewn by the contours; while the position of the principal rock barriers, e.g. those at Eden Lacy, Armathwaite, &c., are shewn by small crosses.

The relation of the drainage area of the Lune to that of the Eden is shewn by the zone stippled between the 900 feet and the 1000 feet contours.

The same map will serve to convey a general idea of the Orography of the region where the Helm Wind prevails.

DIAGRAM SHEWING FOUR STAGES OF EVOLUTION IN NORTH WESTMORLAND.

COALMEASURES
MILLSTONE GLEN
YARDEALE ROCKS

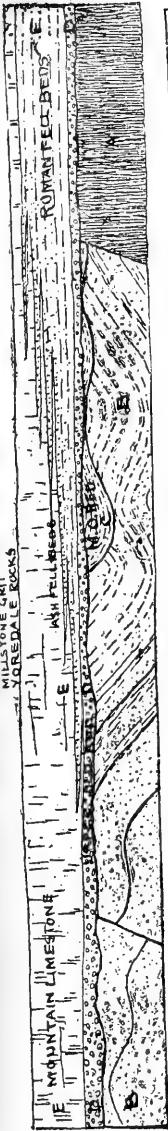


FIG. 1.



FIG. 2.



FIG. 3.

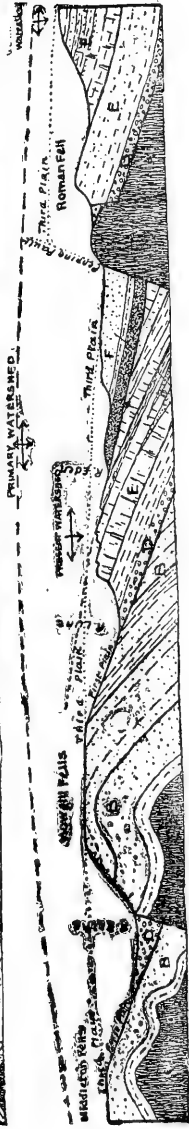
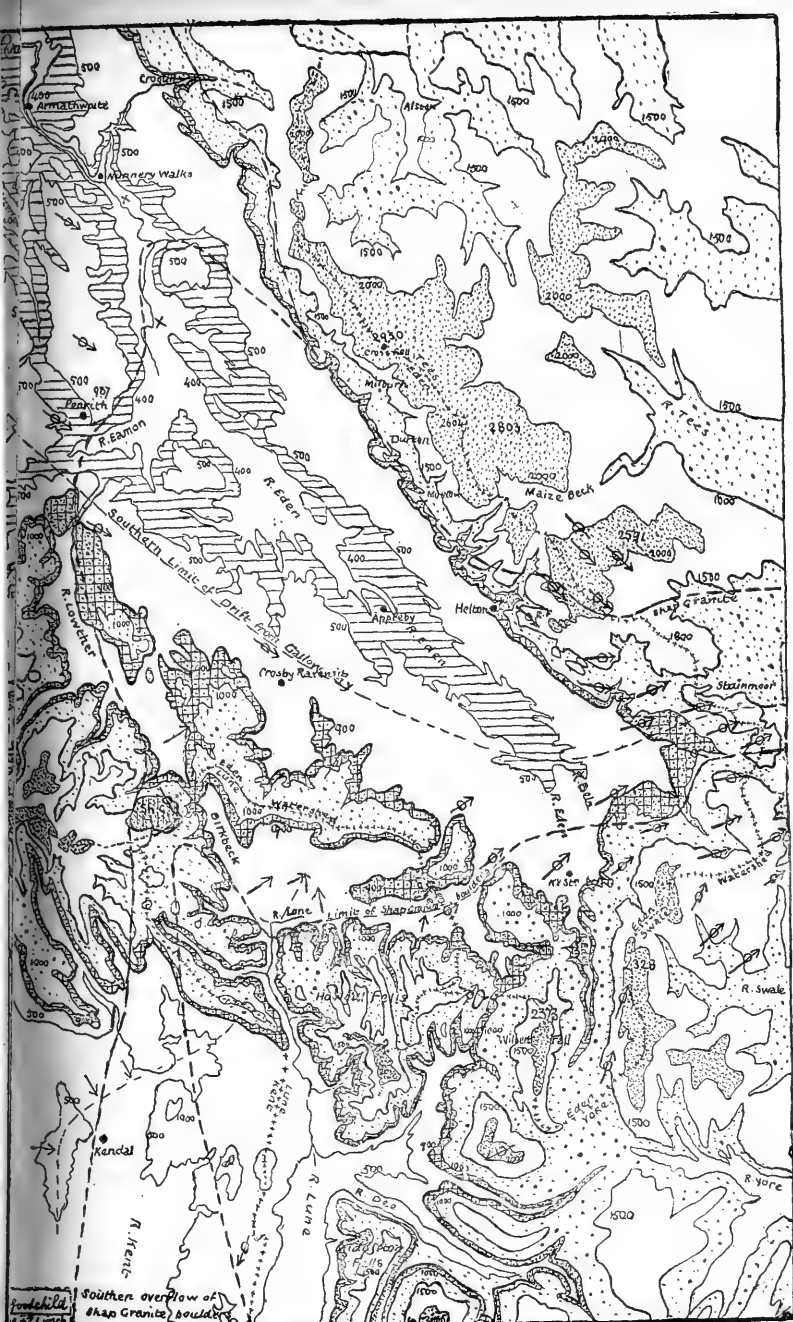


FIG. 4.





Southern overflow of Shap Granite boulders



WEATHER STATISTICS IN THE NEIGHBOURHOOD OF CARLISLE.

*The Presidential Address given at the Annual Meeting of the Association
at Carlisle,*

By R. A. ALLISON, Esq., M.P.

I HAVE already protested in another place and on another occasion at the double impost which your President has to pay to your Chancellor of the Exchequer in the form of what is termed a second Inaugural Lecture. I propose on the present occasion, however—leaving to Mr. Wheatley the duty, which very fittingly falls upon him as president during the present year of the Carlisle branch, of welcoming you to the Border City—to say a few words as to a series of Weather Statistics which, during a period of twenty-five years, I have collected as to the climate in the neighbourhood of Carlisle. I began them at a time when I had not very much to do, rather with a view of cultivating habits of method and regularity by having some daily definite task to perform at a fixed time; and for such an object I can confidently recommend them. And though occupation has somewhat increased since then, yet finding that my interest in their collection had grown from year to year, they have been regularly carried on to the present time; and now that they extend over so many years, afford some basis for an estimate of our climate, and considerable practice for one's arithmetic. The instruments have all been verified, are properly exposed, and from time to time inspected from the Meteorological Office: and during my absence the records have been taken by a competent observer.

I fancy it is popularly assumed that every one who dabbles in meteorology is also something of a seer ; that with the purchase of a rain-gauge he also assumes the prophet's garb. This is, I fear, a flattering misconception of our powers. Ordinary meteorology, like political meteorology, is not a science of accurate and unerring forecasts. It has indeed made some advance since 1846, when Arago declared that "never, whatever may be the progress of science, will scientific men of good repute, and careful of their reputation, venture to predict the weather ;" but the advance has been a limited one. It is possible now, in many cases, to forecast with a fair amount of accuracy the weather of one day from conditions known to have prevailed on the preceding day ; and this power it may reasonably be hoped will be extended as years go on. But for any approach to a forecast of the character of the coming season, or even the coming month, still more for any perception of those cycles of seasons which recur, though we may not say that they are beyond the range of scientific possibility, as yet at any rate we look in vain. Meteorology remains a science in the stage of observation. Those who follow it are like those of whom Burke speaks, as lights in the stern of a vessel, illumining only the course over which it has passed. Their aim is to collect as wide a series of observations as they can, in the belief that some day there will come, as has been said, "the gifted mind, trained into the habit of broad generalisation, who shall bring together out of the vast accumulation of observations which we shall place in his hands, the established facts which they hold buried, and from them draw those philosophical deductions which are required to advance meteorology to a science but little inferior in exactness to astronomy, with which it is so closely allied." In the meantime we must be content to be observers, and from our observations something, at all events, may be gathered. The doctrine of averages at least holds true, and we usually find that the excess or defect of one season—whether in rain or heat or cold—is corrected by something corresponding in that which follows it. We find, too, that there is in them some basis for that popular meteorology which is enshrined in the trite sayings and rhymes of the common

people, in which they have handed down to us the result of centuries of observation by men to whom the coming weather was a matter of extreme importance—and in many cases of life or death. The weather proverbially is a subject of interest to us English; I only hope you may not find twenty-five years of it rather too large a dose.

You are, I dare say, familiar with the variety in the distribution of rainfall that prevails in Great Britain. The lowest annual averages are confined to districts in the south-east and along the eastern coasts of England and Scotland. But towards the west, in Ireland, and especially wherever there are lofty hills to arrest the winds laden with the moisture of the Atlantic, or where there are firths like the Solway or the Severn or the Clyde opening up the adjacent country to the sea, here we have a much larger quantity of rain. Cumberland belongs to the wettest counties, but Carlisle itself, you will be glad to know, is situated at the most favourable point, and has apparently the least rainfall of any station in the county. The average of twenty-five years to 1887 was 30·97 inches; whereas further north, at Scaleby, over a similar period, I have 32·32 inches; while Mr. Taylor, at Kirkandrews, beats me with an average of over 38 inches; and at Dumfries you find one exceeding 40 inches. Again, if you go westward, Wigton and Silloth have over 35; while to the south, at Penrith, it is 31·20; at Pillar Top, among the hills, it is over 80; and lastly, you reach the culminating point at Seathwaite, where you have no less than 143 inches in the year—the highest average in the British isles.

It is interesting to compare our present rainfall with that of previous periods which have been recorded. The late Dr. Barnes, of Bunker's Hill, some years ago contributed to the Transactions of the Royal Society of Edinburgh some notes of such records in this district, reaching back to the middle of the last century. The earliest were those kept by Dr. George Carlyle in Abbey Street—who, according to Miss Ferguson's book, lies buried at St. Cuthbert's, and was father of Joseph Dacre Carlyle, Chancellor of Carlisle—from 1757 to 1783, the year before his death, during which period the mean average seems to have been only 24·39—

six inches less than it is to-day. But these years include the great drought which came to an end in 1763, and was one of the most striking that ever visited this country. Then we have a record from the Rev. Joseph Golding, at Aikbank, Wigton, from 1792 to 1810, the mean average of which is close on 35 inches, or very nearly the same as the average of Wigton for the last twenty-five years. Finally, we have that of Dr. Barnes himself, kept at Bunker's Hill from 1852 to 1870, with an average of 26·04 inches, some four inches less than that registered at the Cemetery from 1863 to 1887, which included, however, that unfortunate cycle of wet years that lasted from 1872 to 1881. That, as we all remember, was a most disastrous period for our agriculturists. Mr. Bright, in one of his famous speeches, reckoned up the loss that it inflicted on them at many millions. It culminated in the cold, sunless, rainy summers of 1877 and the two succeeding years, when no kind of crop could thrive, and the very heart seemed to be washed out of the soil by copious deluges of chilling rain. 1877 was the wettest year I have registered at Scaleby. It had a rainfall of 45·31 inches—nearly fifty per cent. above the average—13·68 of which fell in the months of June, July, and August. At Carlisle in the same three months you had 15·04 inches. That August was the wettest month upon my record, with a fall of 7·34 inches; and it also contained the wettest day—August 18th—when 1·92 inches fell. It was indeed a troublous time. We began to think that the seasons had degenerated altogether, and old people were found affirming that since their youth the climate had changed greatly for the worse. Enquiry, however, leads one to the more comforting belief, that no radical change has really occurred, and that there have been at all times cycles more or less prolonged of good and bad seasons alike; and that when you have had the one, you are pretty sure, if you only wait, in its turn to have the other.

The wettest average month for twenty-five years at Scaleby is July, with an average of 3·72 inches; September follows with 3·38, and August with 3·27; and this accords with the experience of Dr. Barnes, who also describes those as the three wettest months, and speaks of it as a happy arrangement of nature to us poor

mortals. I do not know that we poor farmers are always able to say ditto to that sentiment ; and for us to do so certainly needs something of the philosophy displayed in such a season by a certain David Hope, on the shores of the Solway, in an anecdote related by Carlyle in his "Reminiscences." There had been days and days of continued downpour ; at last a brief spell of fine weather intervened, and David's corn was dry. He was at family worship before proceeding to the field, when some one rushed in and bade him come at once, for a storm had arisen that was driving the stooks into the sea. "Wind," answered David, "wind canna get ae straw that has been appointed mine. Sit down, and let us worship God."

Let us turn to a somewhat pleasanter subject of contemplation, viz., the driest month. And here again my experience accords that of Dr. Barnes, and also of Mr. Golding—that April is one of the driest months of the year. The average of February is 1'66, and of April 1'67 : so they run each other pretty close. Mr. Golding remarks, "I never knew till now that April was the driest month in the year. April showers are so frequently mentioned, as to give a general idea that it is rather a wet month than otherwise : but the showers in April are seldom stormy or attended with great falls of rain." The driest month registered at Scaleby, however, was one very exceptional November in 1867, when only '20 or one-fifth of an inch fell. It being the month preceding my marriage, I should have been inclined to think I had made some mistake if I did not find it generally described as a most remarkable month by all observers ; one from Otterburn, I see, remarking that "moors were burnt all the month, and the oldest person cannot remember seeing moors burning in November at all." The next driest month was April, 1873, when '36 was the amount of rain registered.

The orderly progression of the period of greatest dryness over Europe is rather singular ; and for those who wish to take a holiday without an umbrella, it may be useful to give it. January is the season of least rain in countries adjoining on the Volga, February in Russia, March in Northern France and Southern Britain, April

in the North of England, May in Scotland, June in Orkney and regions further north. It always seems to me a little unfortunate that the popular period for visiting Scotland and our own Lake District should be July, August, and September, or the very months of greatest rainfall. For those indeed who go on grouse intent, August no doubt is a grim necessity; but ordinary tourists, I think, might well choose an earlier portion of the year.

The mean temperature of the year at Scaleby for the fifteen years ending 1888, was 46·6; that of Carlisle for the twenty-five years ending 1888, 46·8: so there is not very much difference between us. In order to give you an idea of how we stand in this point, let me quote you the mean temperatures of one or two other places. That of Edinburgh is 46·9, Dublin 49·3, Greenwich 50·3, Brussels 50·6, Paris 51·5. The highest mean temperature was in 1884, when it rose to 48·3; the lowest was the ungenial year of 1879, to which I have already put a black mark, when it was only 44·2. The warmest month of the period was July, 1878, whose mean temperature was 62·3; July, 1874, and the July of the Jubilee year being next, with 61·4 and 61·2. August 14th and 15th, 1876, were the hottest days I have recorded, when the temperature rose to 93 in shade. The greatest cold, on the other hand, took place in that series of severe winters which occurred in 1878-9, 1879-80, and 1880-81—delightful specimens of those old-fashioned winters which in some quarters are so rapturously received—a rapture which I confess myself I am not young enough to share. To me, as I look back upon them, I confess that distance lends enchantment to the view. The history of them dispels at once the idea of there being any truth in the old adage, “A green Christmas makes a full kirkyard,” though it is found in more languages than one. The advent of extreme cold is marked in every case by an alarming increase of the death rate. The mean temperature of December, 1878, was 27°; of December, 1879, 31·7; and of January, 1887, only 26·4; on the 5th of December, 1878, the thermometer fell to 5°, and at 9 a.m. there were no less than 24 degrees of frost, the thermometer remaining under 32° from the 1st to the 8th of the month. On the 3rd of December, 1879, the

lowest reading was 3° , and at 9 a.m. there were 28 degrees of frost. But in January, 1881, the cold was even more intense. On Sunday, January 16th, the lowest reading for the previous night was 7 degrees below zero: and at 9 a.m. it was still 4.5 below zero, having thus remained at or below zero from 9 o'clock on Saturday night to 10-30 on Sunday morning—a temperature not calculated to secure attention to the eloquent sermons which were no doubt preached in our churches on that day. From the 8th to the 26th the thermometer, with one exception, never rose above the freezing point. The waterfall at Hardraw Scar, Yorkshire, was frozen into a single icicle—an event which had not apparently occurred since the middle of the last century. The weather was the severest which had occurred since the famous cold of Christmas, 1860, which is I believe the most intense that has been known in Britain during the present century; and when it is said that in London as many died, as fell victims to the visitation of cholera in 1848. In many places, from 7 o'clock on Christmas Eve till 11 the next day, the thermometer was below zero, precisely as it was in my own case in 1881. By sheep-farmers I am told, that year, 1860, has been remembered as “the bad year.”

Of other such exceptional seasons that are recorded we may name that of 1838; of 1814, when the Solway was frozen over from the English to the Scottish side, and presented the appearance of a vast plain covered with rugged ridges of frozen snow—all access to even Maryport and Workington being blocked; and lastly, of 1796, when in London the thermometer is said to have fallen no less than 48 degrees below the freezing point to 16 under zero. Some people may like such winters. One of those I have named was, if I remember right, the scene of one of the Midlothian campaigns. But for ordinary mortals, I think many of us will be inclined to say with the Italians, *In verno inferno*.

In the period over which my observations extend there have been many memorable storms, the most notable of which was the terrible gale of the 26th of January, 1884, so destructive to the trees and plantations of this country. It was indeed a winter of storms, as painful experience too well reminds me, each succeeding

gale exploring and enlarging on the fatal legacies of that which went before—and at its close one felt—I know I did—as though one was upon a weather-beaten ship putting into port to repair and refit one's dismantled gear, and rejoiced as when to Ulysses of old—

Kind Athene poured upon him sleep,
Rest to his eyelids, surcease from his toils.*

There was first a severe gale on the 12th of December, 1883, described in the journals of the day as the most violent experienced for many years. Then on the 23rd of the succeeding month the winds were again let loose, and on the 26th the storm reached its greatest height, the reading of the barometer corrected and reduced at ten o'clock at night on Saturday being one of the lowest ever recorded—27·759. On Monday not a single telegraph wire was left in working order between Edinburgh and London. There were in Tuesday's journals no news from foreign parts, and no weather forecast. Editors were left to their own devices. The wind was as variable in its changes as it was sudden in its coming. On Saturday down to six p.m. it raged from the east, then suddenly shifted to the N.W. as the centre of the depression passed on, and raged with equal violence from that quarter—the direction of its onset distinctly marked by the trees as they lay prostrate on the ground. It was a storm of which no certain forecast had been made—a conspicuous instance of how far we still are from that period of accurate prediction to which meteorologists look forward. Of other such visitations I may recall the storm of November 29th, 1874, when the *La Plata* foundered in the Bay of Biscay, the barometer here being 29·005; that of January 24th, 1875, with a reading of 28·850, very destructive in Carlisle, and recalling to its older inhabitants recollections of that of January, 1838; and finally, that in which the Tay Bridge went down on the 28th of December, 1879, the barometer falling to 29·486—not in itself a low reading, but low when compared with 30·103, the reading of the preceding day. A window of my own was blown in almost at the very time that—as we learned the next day—the terrible disaster had

* *Homer's "Odyssey,"* Bk. V., adfin. Lord Carnarvon's Translation.

occurred upon the Tay. I may also name the storm of October 13th and 14th, 1881, when the lowest reading was 28·455 at 9 a.m. on the 14th—which laid low in a single night 4,200 trees at Alnwick, in Northumberland.

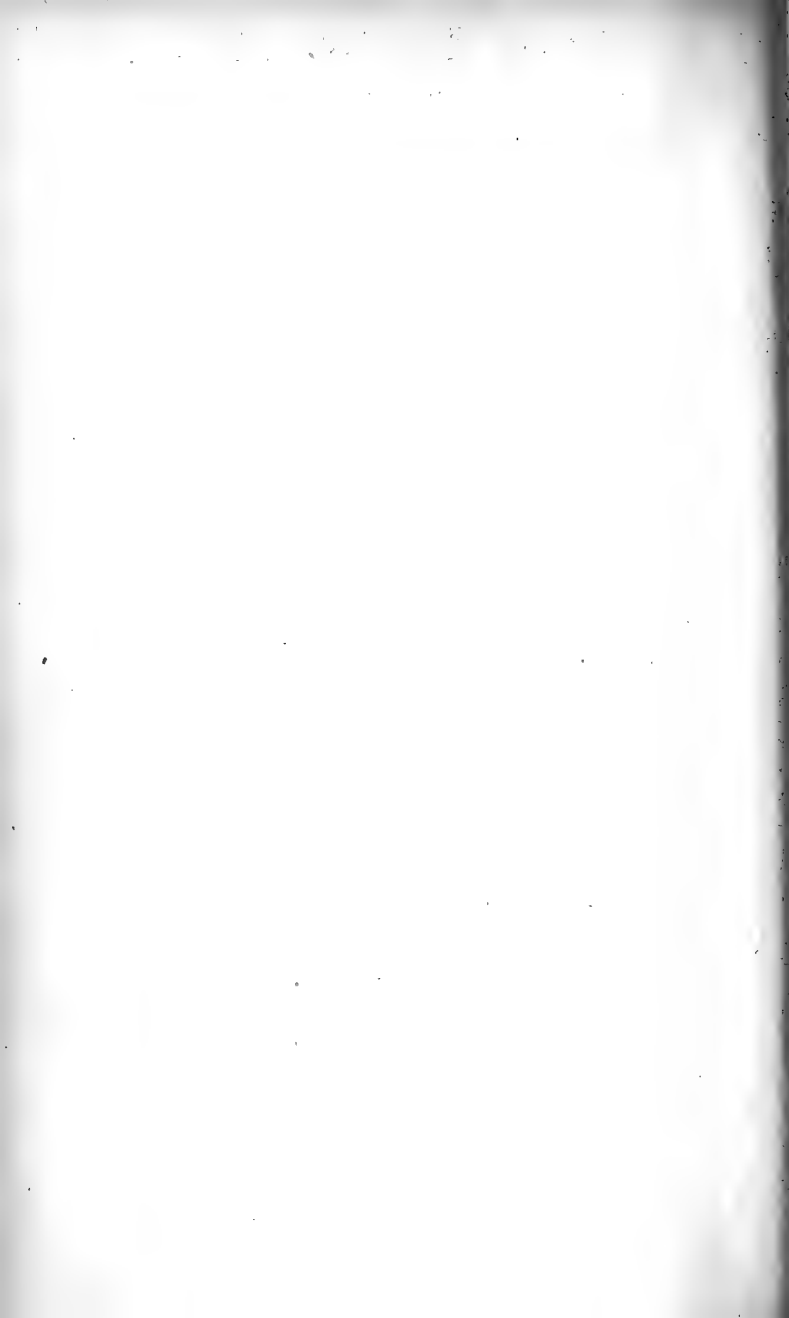
The more accurate forecasting of such visitations is, I need not say, greatly to be desired; it is a matter to which, if I remember rightly, our own Bishop on one occasion called the attention of the Upper House—but is, as I need not say, greatly complicated by our peculiar position, having the vast breeding ground of the Atlantic Ocean to our west, which, if on the one hand it brings us with its currents the milder temperature of warmer regions, renders us also unfortunately liable to these sudden outbursts of unexpected storms. The Atlantic, indeed, is to our ordinary, what Ireland is to our political meteorology.

Of other phenomena, the only ones to which I shall allude are those strange afterglows at sunset which in November and December, 1883, enthralled all the lovers of nature to an astonishing degree; and which, beautiful in themselves, were still more interesting from the circumstance that, in the opinion of scientific men, they were the results of certain volcanic eruptions effected by Dame Nature on a stupendous scale so far back as the preceding August, far far away in the Straits of Sunda, between Java and Sumatra, and which resulted in the entire disappearance of an island 3000 feet in height. I have noted them as exceptionally brilliant on the 25th and 26th of November, and again on the 4th and 5th of December. It seems, as Mr. Norman Lockyer said at the time, somewhat difficult to imagine that a sunset in England in December, should owe its colouration to an event which took place many thousand miles away in August; but he and other observers were led, after full consideration of the evidence, to believe this really had been the case. Such an origin gave fresh interest to the phenomena; and as we watched the beauties of the skies, we were reminded once more that nothing in fiction is so strange as facts; and that the romance of Nature, as unfolded by science, throws into the shade the imaginings of the most fertile fancy.

I fear I have somewhat trespassed on your patience even on such a subject as the weather. Dr. Johnson has explained to us the philosophy of the interest attaching to it in these regions, and I will quote his words in my defence. "An Englishman's notice of the weather," he says, "is the natural consequence of changing skies and uncertain seasons. In many parts of the world wet weather and dry are regularly expected at certain periods; but in our island every man goes to sleep unable to guess whether he shall behold in the morning a bright or cloudy atmosphere—whether his rest shall be lulled by a shower, or broken by a tempest. We therefore rejoice mutually at good weather, as an escape from something that we feared; and mutually complain of bad as the loss of something which we hoped. Such is the reason of our practice, and who shall treat it with contempt? . . . The weather is a noble and an interesting subject: it is the present state of the skies and of the earth, on which plenty and famine are suspended, on which millions depend for the necessaries of life." It may be that since Dr. Johnson's time we have taken some steps in advance towards forecasting these "changeable skies and uncertain seasons." "It cannot be disputed," wrote a man of science long ago, "that all the changes which happen in the mass of our atmosphere, involved, capricious, and irregular as they may appear, are yet the necessary result of principles as fixed, and perhaps as simple, as those which direct the revolution of the solar system." Let us hope they may one day be discovered. The progress of science in other directions is full of promise and of hope. Here everything comes to him who waits—and in this case observes.

If any one wishes to take his part as an observer, I am sure he will find every encouragement from Mr. Marriott, the active secretary of the Meteorological Society. One of his stations in this neighbourhood—that at Stapleton—is about, he told me the other day, to be discontinued; and he would, I am sure, be glad if some one would undertake to fill the gap. I hope you will not be discouraged by the fact that, even of to-morrow I dare not prophecy. Even in a matter of such limited extent, I fear before I prophecy I like to know—but I sincerely wish that you

may have fine weather for an excursion, when fine weather is even more than usually a necessary adjunct to enjoyment—and that for another day the most genial May I have ever recorded, with a mean temperature down to to-day of 55·2 (I see the finest May at Carlisle from 1863 to 1885—that of 1868—had only a mean of 54·2) may continue to hold its own. And if it should, your visit to this district will, I trust, be not one of the least pleasant your Association has had.



REPORT ON THE HELM WIND INQUIRY.

BY WILLIAM MARRIOTT, F.R.MET.SOC.

[From the QUARTERLY JOURNAL OF THE ROYAL METEOROLOGICAL SOCIETY, Vol. XV. No. 70. April 1889.]

(Read at Penrith, February 14th, 1889.)

THE subject of the Helm Wind has been brought before the Royal Meteorological Society on three occasions. On June 18th, 1884, a paper by the Rev. J. Brunskill on "The Helm Wind"* was read. This created a great deal of interest in the phenomenon, and subsequently the Council appointed a Committee to collect information on the subject. A report of this Committee "on the occurrences of the Helm Wind from 1871 to 1884"† was read on April 15th, 1885.

At the meeting on November 18th, 1885, I gave an account of the visit which I made to the district on August 19th to 21st, 1885, in company with Mr. T. G. Benn, F.R.Met.Soc.‡ We made the ascent of Cross Fell, drove through most of the villages between the mountain and the river Eden, and also went over Hartside Fell to Alston, on the eastern side of Cross Fell. By this means we gathered a great deal of general information, but nothing very precise as to what persons had *actually* seen or experienced. We came to the conclusion that if we were ever to get at the cause of

* *Quarterly Journal*, Vol. X. p. 267.† *Quarterly Journal*, Vol. XI. p. 227.‡ *Quarterly Journal*, Vol. XII. p. 1.

the Helm Wind, it would be necessary to have observations made on a systematic plan.

The contour of the country is as follows :—

The Cross Fell range of mountains forms part of the Pennine Chain, which runs from north-north-west to south-south-east. The range from Hartside Fell on the north to Hillbeck Fell on the south is high and continuous, and is not cut through by any valley. Behind this range on the east there is a high mass of land deeply cut by dales and valleys, but the tops of the mountains form a high table-land. Cross Fell is 2,900 feet, Dun Fell 2,780 feet, Dufton Fell 2,292 feet, and Hartside Fell 2,046 feet above sea-level. On the west there is the Vale of Eden, a plain some twenty miles broad, extending to the hills in the Lake District. From the top of the mountain to the plain on the west there is an abrupt fall of from 1,000 to 1,500 feet in about a mile and a half. At the southern end of the range the fall is but slight, there being a gradual fall of from 800 to 900 feet in five miles from Hilbeck to Winton.

At times when the wind is from some Easterly point, the Helm forms over this district; the chief features of the phenomenon being the following. A heavy bank of cloud rests along the Cross Fell range, at times reaching some distance down the western slopes, and at others hovering just above the summit; while at a distance of three or four miles from the foot of the Fell a slender roll of dark cloud appears in mid-air and parallel with the Helm Cloud; this is the Helm Bar. The space between the Helm Cloud and the Bar is usually quite clear, while to the westward the sky is at times completely covered with cloud. The Bar does not appear to extend further west than about the river Eden. A cold wind rushes down the sides of the fell and blows violently till it reaches a spot nearly underneath the Helm Bar, when it suddenly ceases.

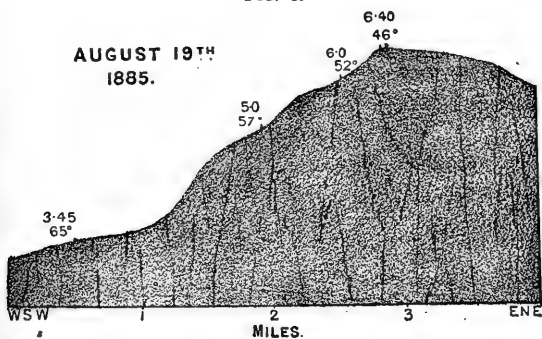
On August 19th, 1885, Mr. Benn and I ascended Cross Fell in company with Mr. R. W. Crosby* and his nephew, and when

* Since this Paper was read I have heard with much regret of the death of Mr. Crosby. He was a most careful observer, and rendered very great assistance in the Helm Wind inquiry.

descending in the evening we were so fortunate as to witness a slight Helm. We left Kirkland at 3-45 p.m., when the temperature of the air was 65° , the wind blowing lightly from the North-north-east. At 5 p.m. we were 1,950 feet above sea-level, the temperature being 57° , and the wind blowing steadily from North-north-east, force 4. By 6 p.m. we had reached 2,670 feet above sea-level, when the temperature was 52° . We gained the summit, 2,900 feet above sea-level, at 6-40 p.m., a few minutes before a mist came on and obscured the view on the east side of the Fell. The air was colder and damper, and the wind stronger; the temperature was 46° , and the wind North-north-east, force 5.

Fig. 1 gives a section of Cross Fell, with the temperatures observed during the ascent from Kirkland to the summit of the mountain.

FIG. 1.



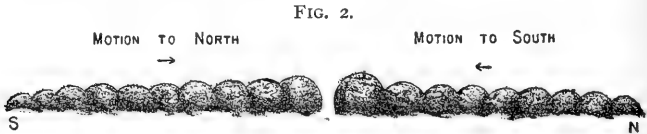
SECTION OF CROSS FELL WITH TEMPERATURE OBSERVATIONS.

Horizontal Scale about 1 in. to 7,000 ft. Vertical Scale about 1 in. to 2,000 ft.

The misty cloud soon covered the top of the Fell, and as we descended the wind increased in force till it reached force 6.

About 8 p.m. we saw the Helm Bar suspended in mid-air a little below our level, but away apparently over Melmerby, Ousby, Kirkland, Milburn, &c. The Bar was really in two parts, there being a decided clear space between them. The northern portion of the bar had a tendency to move southwards, while the southern portion had a tendency to move northwards. The middle of the

Bar appeared to be nearly over Kirkland, while the northern extremity reached to about Renwick, and the southern extremity to Knock Pike. I have endeavoured in Fig. 2 to give a rough sketch of the Bar as seen from Cross Fell.



HELM BAR. AS SEEN FROM CROSS FELL AUGUST 19, 1885.

Although the Bar appeared to be nearly stationary, it was quite evident that there was much commotion in the cloud itself, as portions of the upper and lower surfaces were whirled about in all sorts of ways. We saw this commotion to advantage, as the moon was nearly behind the cloud during the greater part of the time we were descending the mountain. Just before reaching Kirkland at 10-30 p.m., we became conscious that the wind had suddenly ceased, and that the air was much warmer. This fact seemed so strange that Mr. Benn went back about fifty yards and there found the wind blowing quite strongly from the Fell, while where I was standing the air was calm or nearly so, with an occasional light puff of wind from the South-west. The Helm Bar was now nearly overhead. This showed that under the Bar there was an upward current.

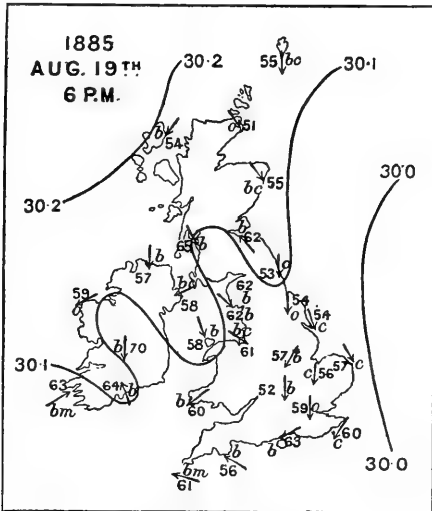
Mr. Crosby, who left us at 7-15 p.m. to return to Kirkby Thore, while Mr. Benn and I proceeded northwards to Ardlie Head Mine, observed the same peculiarities. The next day he sent me the following account :—

“In coming down the face of the ledge I noticed little scraps of vapour beginning to condense in the clear space South-west of us, and remarked to my companion that we should probably get out of the wind before we got home, as there was a very strong indication of the setting of the Helm Bar.

“We crossed the stream forming the County Boundary, about 300 yards above the fence wall of the Fell, and followed the track along the outgang towards Milburn. The condensing was still going on, and there was now a slender string of cloud standing over Milburn town-head ;—the white mist was clinging close to

the Fell tops, and all the other parts were clear, the slender Bar stretching from about Howgill Castle to Kirkland, at about the apparent level of the second ledge of Cross Fell, or that of the Silver Band Mine. About half way between the Fell foot and Milburn, say $\frac{3}{4}$ mile from the bar, we suddenly became aware that we had lost the wind and it was dead calm,—so still that a lighted candle might easily have been carried bare. We searched our pockets for matches to test it, but unfortunately they were not there; however, though we did not actually prove it, we were both certain that it could have been done, and we had ocular demonstration a little latter. We stopped and listened, and the peculiar sighing, murmuring sound of the Helm Wind could be distinctly heard, coming from the quarter where we parted with our friends. The sound was not loud,—the whole affair being of course on a much smaller scale than it often is; but the characteristics of the Helm Wind were plainly there. The air, which had been very cold, was now warm and balmy as a summer evening, and before we got 200 yards from the place where we first noticed the calm we met several very light puffs of air from the South-west. We reached Milburn about 8-45 p.m., the Bar being directly over-head just before we entered the village. It was now dark except for the moon, and as we passed the School, one of a group of men sitting on the step struck a match to light his pipe, but hearing our foot-

FIG. 3.



WEATHER CHART.

steps he turned and had a good look at us, holding the pipe in one hand and the match in the other. After satisfying his curiosity he kindled his tobacco without losing his light, and so demonstrated the perfect stillness of the air at that point. We took the road by Milburn Mill and Hale Grange to Kirkby Thore; just after passing the mill we had a steady breeze from South-west for about five minutes, force about 3; but on the whole it was calm all the way home, where we arrived at 9-45 p.m."

The Daily Weather Chart for 6 p.m. is represented in Fig. 3. From this it will be seen that the gradients were slight, and that fine weather prevailed over the greater part of the British Isles; the only part covered with cloud being the North-east coast of England.

Having witnessed a slight Helm, we were enabled to request observations on certain definite features. Special forms were prepared and sent to a number of persons in the district who had promised to fill them up.

Observations and reports have been received from the following places:—

Alston (Love Lady Shield)	T. W. Dickinson
Appleby (Fair Hill)	W. Wallace
Ardle Head Mine	J. C. Russell
Askham	W. T. Nicholson
Blencowe	T. Fawcett
Cashwell Mine	A. Shield
Culgaith	Rev. G. W. Atkinson
Dufton	C. Liddle
Edenhall	B. W. Lovejoy
Kirkby Stephen	J. Rennison
Kirkby Thore	R. W. Crosby
Kirkland	Rev. A. Edwards
Langwathby	J. Powley
Lazonby	Rev. B. W. Wilson
Little Salkeld	W. Arthur
Melmerby	Rev. A. C. Pittar
Milburn	J. W. Harrison and D. Smith
Newton Reigny	T. G. Benn

Ousby
 Renwick
 Skelton
 Temple Sowerby
 Tynehead

Miss Golding
 T. Savage
 T. Toppin
 J. Byres
 T. Richardson

In order to discuss the observations I prepared some small charts comprising the northern part of England and the south of Scotland, and on these I plotted the direction and force of the wind, the temperature of the air, and the amount of cloud, at all the stations over the whole of that area, which were available on each day when a Helm Wind was reported. It was at once seen that the Helm occurred mostly when the general direction of the wind was East or North-east, although it occasionally occurred when the wind was North or South-east.

In the accompanying Table I have given for each month of the three years 1885-87, the number of days (1) on which the wind over the greater part of the country blew from some Easterly point (that is from North to South-east); (2) when the local wind was from the Eastward (for this the observations at Newton Reigny have been used); (3) when there was a Helm formation; and (4) when there was a Helm Bar.

DAYS OF EASTERLY (NORTH TO SOUTH-EAST) AND HELM WINDS,
 1885-1887.

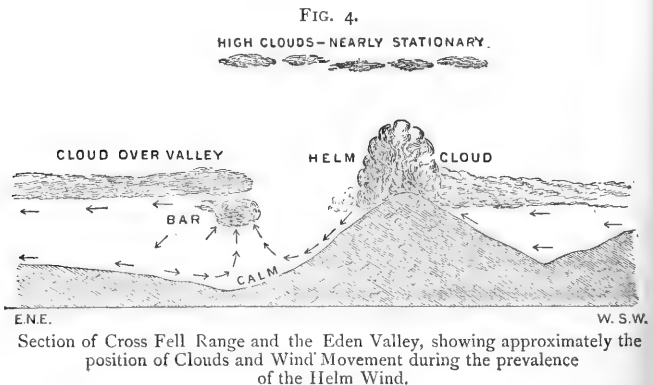
Months	General East Wind			Local East Wind			Helm Formation			Helm Bar		
	1885	1886	1887	1885	1886	1887	1885	1886	1887	1885	1886	1887
January	14	11	6	19	10	10	12	8	0	8	8	0
February	2	10	8	12	14	12	2	12	5	0	9	2
March	8	16	6	16	18	8	12	16	1	1	13	0
April	15	17	11	20	18	13	11	11	9	5	9	4
May	7	15	16	13	16	19	5	12	12	0	4	8
June	6	5	9	11	12	10	2	6	2	2	3	0
July	7	3	1	10	6	2	1	1	2	1	1	0
August	14	3	4	20	7	4	9	3	2	7	0	0
September ...	1	10	5	9	12	7	0	6	4	0	3	1
October	9	19	4	12	21	7	12	15	4	9	5	2
November	12	4	10	18	12	18	9	7	7	7	3	2
December	3	4	6	5	7	7	2	5	4	1	5	0
Totals	98	117	86	165	153	117	77	102	52	41	63	19

From this Table it will be seen that the Helm occurs at all seasons of the year; and that it is not such a rare occurrence as was generally supposed to be the case—the Helm Bar having been observed on 41 occasions in 1885, 63 in 1886, and 19 in 1887. In the Appendix I have given the observers' notes on several Helms, in order to show that the phenomenon is not restricted to any particular season.

As already stated, the wind blows strongly down the Fell sides until it comes nearly under the Bar; it then rushes upwards, and so produces a calm beneath the Bar. The air in rushing upwards draws the air inwards and upwards along with it on the other or western side. This accounts for the Westerly wind which blows on the western side of the Bar. Further to the westward, away from the influence of this eddy, there should be a *downward* current from the eastward. This has been confirmed by observations made by Mr. Dent, on April 21st, 1888. (See Appendix, p. 126.

The ends of the Bar are frequently joined to the Helm Cloud, so that the clear space between assumes an oval or an elliptical form.

Fig. 4 gives a section of the Cross Fell range and the Eden valley, and shows approximately the position of the Helm Cloud and the Bar, with the direction of the wind.



On examining the charts already referred to it was seen that whenever the Helm occurred the sky was almost invariably cloudy to the eastward; and probably the stratum of cloud was of no great altitude. The distribution of pressure was mostly of a cyclonic character.

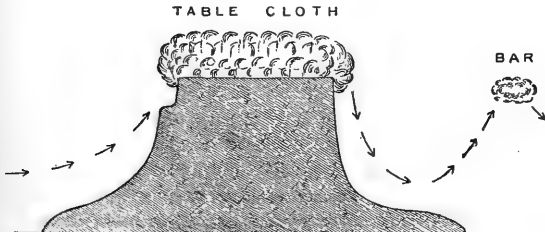
The phenomenon appears to be due to the abrupt descent of the hills on the west, the air in pouring over the declivity is warmed in its descent and is consequently able to hold a greater amount of moisture in suspension. The cloud therefore is dissolved on the western side of the Fell, and only re-forms at a distance of several miles after the disturbance caused by the irregularity in the contour of the land has been overcome. The Bar is produced by a rebound or ricochet of the air at the foot of the Fell, the Bar indicating the width of the upward current and also the point at which condensation takes place. The roaring sound which is heard when the Helm Wind blows is no doubt due to the rush of cold air down the sides of the Fell.

Similar winds occur on Table Mountain, Cape Colony, and on the Hackgalla Mountain in Ceylon.

Sir John F. W. Herschel, in his *Meteorology*, pp. 95-97, gives the following account of the "Table-cloth":—

"That the mere self-expansion of the ascending air is sufficient to cause precipitation of some of its vapour, when abundant, is rendered matter of ocular demonstration in that very striking phenomenon so common at the Cape of Good Hope, where the South or South-easterly wind which sweeps over the Southern Ocean, impinging on the long range of rocks which terminate in the

FIG. 5.



The "Table Cloth" on Table Mountain. Rough schematic diagram with vertical distances purposely exaggerated, modified from Herschel's *Meteorology*.

Table Mountain is thrown up by them (as marked by the arrows in the direction of fig. 5), makes a clear sweep over the flat table land which forms the summit of that mountain (about 3,850 feet high), and then plunges down with the violence of a cataract, clinging close to the mural precipices that form a kind of background to Cape Town, which it fills with dust and uproar. A perfectly cloudless sky meanwhile prevails over the town, the sea, and the level country, but the mountain is covered with a dense white cloud reaching to no great height above its summit, and quite level, which, though evidently swept along by the wind, and hurried furiously over the edge of the precipice, dissolves and completely disappears on a definite level, suggesting the idea (whence it derives its name) of a 'table-cloth.'

"Occasionally, when the wind is very violent, a ripple is formed in the aerial current, which, by a sort of rebound in the hollow of the amphitheatre in which Cape Town stands, is again thrown up, just over the edge of the sea, vertically over the jetty, where we have stood for hours watching a small white patch of cloud in the zenith, a few acres in extent, in violent internal agitation (from the hurricane of wind blowing through it), yet immovable, as if fixed by some spell, the material ever changing, the form and aspect unvarying. The Table-cloth is formed also at the commencement of a 'North-wester,' but its fringes then descend on the opposite side of the mountain, which is no less precipitous."

Sir Samuel W. Baker in his *Eight Years in Ceylon*, pp. 145-148, gives the following account of a wind similar to the Helm Wind, but without the Bar, which occurs on the Hackgalla Mountain in Ceylon:—

"From June to November, the South-west Monsoon brings wind and mist across the Newera Ellia mountains. Clouds of white fog boil up from the Dimboola Valley, like the steam from a huge cauldron, and invade the Newera Ellia plain through the gaps in the mountains to the westward. The wind howls over the high ridges, cutting the jungle with its keen edge, so that it remains as stunted brushwood, and the opaque screen of driving fog and drizzling rain is so dense that one feels convinced there is no sun visible within at least 100 miles.

"There is a peculiar phenomenon, however, in this locality. When the weather described prevails at Newera Ellia, there is actually not one drop of rain within four miles of my house in the direction of Badulla. Dusty roads, a cloudless sky, and dazzling sunshine astonish the thoroughly soaked traveller, who rides out of the rain and mist into a genial climate as though he passed through a curtain. The wet weather terminates at a mountain called Hackgalla (or more properly Yakkadagalla, or Iron Rock). This bold rock, whose summit is about 6,500 feet above the sea, breasts the driving wind, and seems to command the storm. The rushing clouds halt in their mad course upon its

crest, and curl in sudden impotence around the craggy summits. The deep ravine formed by an opposite mountain is filled with the vanquished mist, which sinks powerless in its dark gorge; and the bright sun, shining from the east, spreads a perpetual rainbow upon the gauze-like cloud of fog which settles in the deep hollow.

“This is exceedingly beautiful. The perfect circle of the rainbow stands like a fairy spell in the giddy depth of the hollow, and seems to forbid the advance of the monsoon. All before is bright and cloudless, the panorama of the Ouva country spreads before the eye for many miles beneath the feet. All behind is dark and stormy; the wind is howling, the forests are groaning, the rain is pelting upon the hills.

“The change appears impossible; but there it is, ever the same; season after season, year after year, the rugged top of Hackgalla struggles with the storms, and ever victorious the cliffs smile in the sunshine on the Eastern side, the rainbow reappears with the monsoon, and its vivid circle remains like the guardian spirit of the valley.

“It is impossible to do justice to the extraordinary appearance of this scene by description. The panoramic view in itself is celebrated, but as the point in the road is reached where the termination of the monsoon dissolves the cloud and rain into a thin veil of mist, the panorama seen through the gauze-like atmosphere has the exact appearance of a dissolving view: the depth, height, and distance of every object, all great in reality, are magnified by the dim and unnatural appearance; and by a few steps onward the veil gradually fades away, and the distant prospect lies before the eye with a glassy clearness made doubly striking by the sudden contrast.

“The road winds along about midway up the mountain, bounded on the right by the towering cliffs and sloping forest of Hackgalla, and on the left by the almost precipitous descent of nearly 1,000 feet, the sides of which are clothed by alternate forest and waving grass. At the bottom flows a torrent, whose roar ascending from the hidden depth increases the gloomy mystery of the scene.

“On the North-east and South-east of Newera Ellia the sunshine is perpetual during the reign of the misty atmosphere, which the South-west monsoon drives upon the western side of the mountains. Thus there is always an escape open from the wet season at Newera Ellia by a short walk of three or four miles.

“A long line of dark cloud is then seen, terminated by a bright blue sky. So abrupt is the line, and the cessation of the rain, that it is difficult to imagine how the moisture is absorbed.

“This sudden termination of the cloud-capped mountain gives rise to a violent wind in the sunny valleys and bare hills beneath. The chilled air of Newera Ellia pours down into the sun-warmed atmosphere below, and creates a gale that sweeps across the grassy hill-tops with great force, giving the sturdy

rhododendrons an inclination to the North-east, which clearly marks the steadiness of the monsoon."

I am indebted to Mr. R. H. Scott, F.R.S., for the translation of the subjoined notice of "An interesting Cloud Formation over the Bay of Buccari," by Prof. H. Mohorovicic, which appeared in the *Meteorologische Zeitschrift* for February 1889, p. 56, and which bears upon the subject of the Helm Bar:—

"We do not often read of a whirlwind with its axis horizontal, and I have not been able to find any notice of such a phenomenon in the *Meteorologische Zeitschrift*. I think, therefore, that what I say may be of interest.

"The following are the observations taken at Buccari (lat. $45^{\circ} 18' N$, long. $14^{\circ} 33' E$) on October 17th, 18th, and 19th, 1888:—

October, 1888	Barometer	Temperature	Vapour Tension	Relative Humidity	Wind		Amount of Cloud	Motion of Clouds	
					Direction	Force		Cirrus	Cumulus
17th, 7 a.m.	30·134	53·4	·236	58	E	3	0	.....	Not measurable
10 a.m.	...	...	...	...	...	...	...	.....	S 60° E
2 p.m.	·067	58·1	·209	43	E	4	2	.....	Not measurable
4 p.m.	...	...	...	...	...	...	...	S 60° E	S 75° E
9 p.m.	30·020	53·1	·232	57	E	6	2	.....	E
18th, 7 a.m.	29·914	53·8	·232	56	N	3	7	S 15° E	N 50° E
10 a.m.	...	...	...	...	...	...	...	S 5° E	N 85° E
11 a.m.	·926	...	...	...	...	...	...	.....	.....
2 p.m.	·882	56·7	·209	45	SE	6	9	Not m'surable	N 70° E
4 p.m.	·867	...	...	...	...	...	8	S 35° W	S 80° W
9 p.m.	29·969	55·6	·228	51	E	6	1	.....	Not measurable
19th, 7 a.m.	30·083	44·2	·130	45	E	2	0	.....	N 45° E
2 p.m.	30·138	49·1	·134	39	E	3	0	.....	NNE

"On October 18th at 10 a.m. the drift of the upper strato-cumulus was N 45° E, and of the lower N 80° E; about 4 p.m. the drift of the strato-cumulus was N 65° E.

"Early in the morning on October 18th the sky was densely overcast and the barometer falling. On the mountains to the North-east we saw a long row of cumulus stretching from North-west to South-east, with its summits torn into a fringe. From these masses of scud of various sizes broke off, and they constantly diminished in bulk as they approached the zenith. Not one of these reached the altitude of 50° , and a strongly-marked descending motion was observable in them. In the South-west there was a similar mass of cumulus, as far as could be seen. It was parallel to that previously noticed, and it extended

from the altitude of 70° to 20° , so that the zenith was quite clear of cumulus, and over the hills of Kostrena we could see in parts blue sky and in parts the upper clouds. Above the cumulus two layers of small strato-cumulus were visible, which distinguished themselves from each other by differences in their motion. Through the interspaces of the strato-cumulus some long streaks of cirrus running North and South appeared; these moved to the Southward.

“Over the middle of the Bay of Buccari small patches of cloud were forming themselves throughout the day, and had no horizontal movement at first, but when they grew bigger and began to ascend, they moved quickly to the North-east and East, at a rate I estimated at 15 or 16 metres per second, and they disappeared in the main mass of the cumulus. Just over Kostrena similar cloud patches could be seen, growing smaller and smaller and at last vanishing. The main mass of the cumulus showed no progressive motion.

“Early in the morning the wind was North, force 3. Afterwards it came from all directions, at times North-west, South-west, South-east, and North-east. Towards noon the axis of the cumulus shifted towards South, and it broke up into separate fragments. In the afternoon it became compact again. Below Kostrena, in the Gulf of Fiume, the wind blew in frightful squalls from West and North-west. In the harbour of Portorè there were violent squalls from all directions. The local steamer which plies between Fiume and Buccari had some heavy sacks actually blown off her deck. It is impossible to imagine the existence of such a permanent mass of cumulus unless on the assumption of a rotatory motion about a horizontal axis.” [The author illustrates this by a diagram which shows a marked ascending movement over Buccari as evidenced by the constant fresh formation of cumulus, and the influx of air from all sides.]

“Above a horizontal motion from South-west, and at noon from West, appears, and over the Gulf of Fiume there was a descending and returning motion, as proved by the loose fragments of cumulus and by the wind. It is probable there was a similar mass of cumulus over the mountains to the North-east. The phenomenon lasted till five p.m.

“The same phenomena were observed on the afternoon of the 17th, but not so distinctly. Such circulations are not rare here, and are probably due to the formation of the ground, which is in terraces. When there is a Bora, which there was on the days in question, there is usually a long bank of cumulus in the North-east, from which particles break loose but never reach the zenith, over Buccari. In the South-west they reappear and vanish on the horizon. This shows a descending followed by an ascending motion.”

Dr. Hann appends a note pointing out the analogy between the phenomena described in the paper, and the Table-cloth at the Cape, and the Helm Wind.

APPENDIX.

Extract from the Observers' Notes on several Helm Winds.

NOVEMBER 19TH, 1885.

ARDLE HEAD, OUSBY, Mr. J. C. RUSSELL. 3-30 p.m. Helm Cloud about 300 feet below the summit of Cross Fell. The Bar apparently over and parallel to the Eden, the north end being somewhere about Croglin and the south end about Stainmore in Westmorland. Both ends of the Bar are joined to the Helm Cloud. The wind is East. Clouds and vapour near the Bar move about as though in a whirlwind. Thaw set in, with some very fine snow falling. Very strong wind up here on the Fell, but hardly any wind down in the valley. The Helm only lasted about 22 hours; it began about 5 p.m. on Wednesday.

OUSBY RECTORY, Miss GOLDING. 3 p.m. The Helm Cloud covering the top of Cross Fell, and extending the whole length of the Fell as far as can be seen. No Bar to be seen, but a mass of heavy clouds all round the horizon without a break, joining the Helm Cloud on each side at the north and south ends, and apparently reaching on the west about halfway between Penrith and Ullswater. The direction of the wind is East. A few higher clouds are slightly whirling in and out, but not moving in any particular direction. The belt of clouds seemed to have a centre a little to the north of the top of the Fell, and the wind seemed to push the clouds north and south from that centre, and to chase them all round till they met in the west, where they made a bank a little higher than the Ullswater Fells. Cross Fell was a little hazy.

MELMERBY RECTORY, Rev. A. C. PITTAR. 10-45 a.m. The top of Cross Fell is hidden. The Bar consists of fragmentary light clouds to the west. The north end of the Bar is rather close, apparently not much further than Gamblesby; the south end is a good distance off, probably at Appleby. The north end of the Bar is very distinctly joined to the Helm Cloud, and the south end seems to be. The direction of the wind is South-east. The weather cold, dry and windy, with blue sky.

3 p.m. The Bar seemed a long distance off to the west, and joined all round with the Helm Cloud. There was not much wind, and towards evening the Helm Cloud began to sink behind the Fells. There was a quiet night and but little of the Helm visible next morning, and no Bar.

The Helm Cloud appeared yesterday afternoon. The wind blew at times keenly in the night; blowing this morning in strong gusts. The Bar at the north end is well defined, but does not seem to extend far, and ends in fragmentary clouds which continue across the western sky in the direction of the south end.

LITTLE SALKELD, Mr. W. ARTHUR. Midday. Helm Cloud covering Cross Fell. No Bar. Wind East.

LANGWATHBY, Mr. J. POWLEY. 9-30 a.m. Helm Cloud on the top of Cross Fell; mountain slope clear. No Bar. Wind East. Clouds rising in front of Helm.

TEMPLE SOWERBY, Mr. J. BYRES. 9 a.m. Helm Cloud along the top of Cross Fell and quite down the mountain: very dense. No Bar. Wind East. Slight Clouds coming out of the Helm.

Helm wind came on during the night; strong constant East wind all day; no Bar, but at times broken clouds coming from the East. The cloud over the mountain one dense mass at 3 p.m., more into cumulus over Dun Fell. Towards evening very cloudy.

MILBURN, Mr. J. W. HARRISON. 6 p.m. Helm Cloud just covering the summit. The Bar is about on a line with the Eden; the north end might be about as far as Lazonby and the south end about Brough. The Bar is joined at both ends with the Helm Cloud. The wind is North-north-east.

When I left home for the mine after dinner all was clear overhead and very fine, with dark cloud on the other (west) side of the country. Before I got to the mine thin fleecy clouds began to gather on the top of the Fell, and sharp puffs of wind, almost like whirlwinds, began to blow, and soon the Helm formed.

MILBURN, Mr. D. SMITH. 10-30 a.m. Helm Cloud extending from 600 ft. below the summit of Cross Fell to 200 ft. above. The Bar lying apparently from south-east to west of north. The north end of the Bar over Morland, and the south reaching south of Dufton. The south end of the Bar is joined to the Helm apparently at Dufton. Wind East. Small cloudlets breaking off from the Helm and moving eastwards. Much agitation on the south-east of the Bar, clouds breaking off and moving north-west. Intensely cold and dry.

2 p.m. Wind changing fitfully and blowing from the South-east. Fleecy clouds covering the west and north. Weather becoming milder; and a little rain.

KIRKBY THORE, Mr. R. W. CROSBY. 9 a.m. Dense Helm on Cross Fell. Wind East-north-east.

Helm set on Fell at 4 p.m. yesterday (18th). Bar broken and general North-east wind.

APPLEBY, FAIR HILL, Mr. W. WALLACE. About 7-30 a.m. I observed the Helm wind blowing from the Fell towards Appleby with great velocity. The sky over the vale of the Eden to the west was, in a great measure, clear, and there was no cloud Bar formed in connection with the wind. I observed

that when the Helm clouds reached Appleby they were checked in their course to the west, by nothing visible, and portions of the swiftly moving clouds were thrown back to the east for a short distance. There were three strata of scattered small clouds to the east. The cirrus seemed quite still; at least I could detect no motion. I however detected a very slight motion to the east in the middle stratum. In about an hour and a half the whole of the sky in the upper part of the Eden was clouded over; the sky, however, in the lower part continued tolerably clear until about noon.

At 1-30 p.m. the appearance of the Helm Cloud was truly magnificent. The whole of the vale of the Eden was clouded over, but the sun shone brightly on the Helm Cloud, which was far above the top of Cross Fell. There was great disturbance where the Helm Cloud and Bar joined at the north end of Cross Fell, and the resplendent clouds rapidly changed their forms into fantastic shapes. The Bar drifted in the direction of the wind, and small dark clouds rose out of the Helm, and moved in almost every direction except to the East and in the direction of the wind. As soon as these small dark clouds approached the Bar they turned from it and fell back towards the Helm Cloud; but in every case that came under my observation they faded away and became invisible before reaching the Helm Cloud.

FEBRUARY 18TH AND 19TH, 1886.

MELMERBY, Rev. A. C. PITTAR. 18th, 5 p.m. Bar to the westward, the north end being about Unthank, and the south end a little beyond Ousby. The north and south ends of the Bar are joined to the Helm Cloud. Wind East, moderately strong.

LITTLE SALKELD, Mr. W. ARTHUR. Helm on three days. Cloud high above Cross Fell. Bar close; about 2 miles from the bottom of the Fell. We had no wind here, and never have when the Bar is close to us at Little Salkeld. Wind North-east.

KIRKLAND, Rev. A. EDWARDS. 19th, 9 a.m. Fells hidden. Wind East, light. Frost and snow. Temperature $30^{\circ}5$.

KIRKBY THORE, Mr. R. W. CROSBY. 18th, 9 a.m. Helm with broken Bar. Wind East-north-east, overcast. Temperature $36^{\circ}2$.

19th, 9 a.m. Helm with Bar close to the Fell. Wind South-east, overcast, with snow showers. Temperature $31^{\circ}8$.

MAY 13TH, 1886.

CASHWELL MINE, Mr. A. SHIELD. 9 a.m. Wind North-east. Temperature 37° .

LANGWATHBY, Mr. J. POWLEY. 10 a.m. Helm Cloud on the top of Cross Fell, and not far down. Bar to the eastward of this place, and pretty

close to the Fell; the north end is about Gamblesby, and the south about Appleby. Bar at the north end joined to Helm Cloud. Wind North-east. Bar joined by black cloud to west, and stretching from Lazonby to about Appleby. Bitterly cold; snow on the hills.

1 p.m. Mountain nearly clear, Helm breaking off. Bar disappearing. Wind East, but not so strong; no roaring sound.

On the day before (12th) Cross Fell was quite invisible, but the mighty roar of the wind was very distinctly heard.

KIRKLAND, Rev. A. EDWARDS. 9 a.m. Helm Wind. Overcast; rain, hail, and snow. Severe storm. Temperature 40°.

KIRKBY THORE, Mr. R. W. CROSBY. 7 p.m. Helm Cloud covering the high points of Cross Fell, and reaching nearly down to the first ledge from the top. The Bar is to the eastward of this place; the north end stretches as far as can be seen, and the south end is over the Stainmore depression. The south end of the Bar is joined to a continuation of the Helm Cloud on the Cross Fell range. Wind West-north-west, force 5. Bar cloud is moving from the North-east, force 6. High clouds between the Helm and the Bar apparently stationary, with perhaps a slight drift from North-north-west. Ragged clouds on the eastern edge of the Bar ascending and condensing. Temperature 41°.

There has been more or less Helm since Sunday (9th), but the wind was strongest yesterday (12th), and through last night; about noon to-day it moderated and turned warmer; but is rising again this evening and turning cold.

LANGRIGG, NEAR MUSGRAVE, Mr. J. RENNISON. 6-20 p.m. Helm on north fells; much broken south of Roman Fell; but wind roaring about Hilbeck. The Bar seemed to be 1 or 2 miles from the fells, until it got opposite to Roman Fell, when it turned west over Crosby Garrett. It then swept round by Kirkby Stephen and South Stainmore; a stream of clouds connecting it with the Helm Cloud at Windermere end. Though not under the Bar the wind was quite calm, except gusts from both East and West. The Helm Cloud along Warcop and Hilbeck Fells drifted north to Roman Fell, when a stream of clouds blew across towards the Bar but wasted away before they got to it.

I heard from some shepherds that the wind was very strong on the Fell. One young man said it took him completely off his feet, and that he came down on his back. Others said that they could scarcely stand at all.

MAY 28TH, 1887.

KIRKBY THORE, Mr. R. W. CROSBY says:—There was a splendid specimen of the Helm Wind this morning. On looking out a little before 6 a.m., I found that the whole of the range of hills visible from our house was closely covered with a thick fleecy sheet of cloud, which fitted the ground so exactly that one could see the shape of the prominent parts reproduced on the upper surface of

the cloud, although it must have been some hundreds of feet thick at the summit.

This cloud was driving rapidly down the slope, the surface having a sort of billowy appearance but retaining its consistency until it reached the Fell foot, where it seemed to break up like spray at the foot of a waterfall, and then disappear; there was a great quantity of this spray-like vapour in some places,—notably on both sides of Knock Pike, for some distance along the Fell foot.

Murton Pike was enclosed in the cloud,—Dufton and Knock Pikes stood out but there was a thick cap on the top of Dufton Pike, retaining the shape of the Pike on its upper surface. I was reminded of the description given by Mr. Wallace and printed by the Royal Meteorological Society in their report.* On close observation one could see that immense masses of vapour were being driven rapidly down Dufton Gill, and, striking against the almost perpendicular eastern face of the Pike, were projected high into the air, until bent over by the upper current, when they fell downwards over the top of the Pike, and melted away about a quarter of the way down the Pike side. Looking towards the East or East-south-east, the rolling billowy masses of vapour showed very distinctly, and had a most magnificent appearance, lit up with the bright morning sun.

The Bar was formed of a dense roll of cloud, at a low elevation, and stood a little west of the river Eden. It joined the Helm Cloud at both ends, and thus an almost clear space of blue sky was surrounded by dense masses of vapour. The form of this space was a tolerably regular ellipse, extending, roughly speaking, from Brough to Langwathby, the ends being rounded by the connection between the Helm Cloud and the Bar. Looking South-west directly at the Bar (distant then short of half a mile) both ends appeared to be drifting towards the centre, or rather, towards a point straight opposite to where I stood. I believe, however, that this was merely an optical deception, caused by the laws of perspective, by which the vapour drifting South-westwards in parallel lines appeared to converge towards the point of sight. On going to a place directly under the Bar I found the vapour overhead driving straight towards South-west, streaming out of the clear air from North-east, and condensing as it approached the thick part of the Bar, just in the same way as is usual when the Bar stands nearer the Fell, and the endwise motion could not be discerned from that standpoint.

There were no scraps of cloud driving across between the Helm Cloud and Bar, all the lower air being quite clear and bright between, from the place where the spray-like vapour disappeared to that where the condensation began. There was, however, a light fleecy cloud about the centre of the ellipse at a considerably higher elevation than the Helm Cloud, which had a gentle motion from East-north-east, with whirling eddies; this cloud, though in constant

* *Quarterly Journal*, Vol. XI. p. 233.

motion, retained its position in the same way as the Bar does, the waste on the South-west being constantly replenished from North-east.

The wind at our house was blowing strongly from a little East of North-east, a moderate gale somewhat gusty and irregular in force. The movement of the vapours on the Fell side showed that there a furious blast was raging.

Wishing to observe the condition of things under the Bar, I walked towards the South-west to a point about 200 yards beyond the River Eden. Every step westward found the wind decreasing in force, until about half-way, there began to be slight puffs in a contrary direction: the smoke of a chimney by the main road side was blown from North-west, but the currents at that point were unsteady. I got under the North-east edge of the Bar a little before reaching the Eden, and found that it was gradually advancing towards the Fell. Standing on the wooden bridge across the Eden, I found a steady breeze from North-west blowing up the river. I went about 200 yards further, and met a steady gentle breeze from the West,—the usual feature of a Helm with a regular Bar, but which I was anxious to test when the Bar stood far away from the Fell, as in this instance. I stayed here a few minutes to make observations; the whole sky westward was obscured with clouds, of which the Bar formed the eastern edge; overhead the cloud, which was low, was so dense and compact that its motion could not be discerned, although the rapid drift at the edge showed that a strong current was passing overhead. The loud roaring of the wind on the Fell could be distinctly heard, resembling the sound of a heavy train on the railway,—indeed, but for its continuity, a stranger to the Helm would have judged the sound to be that of a train. On returning homewards I found that, as the sun got higher, the Bar was advancing towards the Fell, and growing less dense. I had the wind from the West at my back all the way home, but on reaching the house met again the North-east current, much decreased in force since I went away, the North-east edge of the Bar being now nearly over the house,—this would be about 7 a.m.

On making the usual observations at 9 a.m., I found the Bar closed up to about half-way between Kirkby Thore and the Fell; the clouds overhead were much thinner, and their speed decreased to that of a moderate breeze, the direction being still from East-north-east. The ground wind was now a light breeze from the South. As the day advanced the dense vapours of the Bar were dispersed, and broken into fragments of cirrus cloud, at a higher level; the wind lessened in force, and the Helm Cloud drew back towards the Fell top, leaving the principal part of the slopes clear of vapour.

APRIL 21st, 1888.

KIRKBY THORE. Mr. R. W. CROSBY. 9 a.m. Strong Helm. Fell tops thick. Overcast. Surface wind West-south-west, force 2. Upper wind North-east, force 5. Temperature 40°.

Mr. W. Dent, of Street House, told me that as he left home about 9 a.m. for

Appleby market, the wind at that point was furious from North-east, and seemed to *fall down* upon him. When he got to Bolton, about a mile nearer the Fell, he found the wind was gently blowing in the opposite direction, as it was at Kirkby Thore. This settles a point I have long suspected but never proved before, viz., that the current comes down again after its bounce up at the Bar. Street House is about a mile and a half South-south-west from Kirkby Thore.

NOTABILIA OF OLD PENRITH.

BY GEORGE WATSON.

(Read at Penrith.)

THE MANOR OF PENRITH.

FROM the earliest historical times, Cumberland was a bone of contention between English and Scottish royalty. At length, in 1236 Henry III. of England and Alexander II. of Scotland agreed to a compromise by which certain large districts in Cumberland and Northumberland where no castles existed, were assigned to the Kings of Scotland, to be held in fealty to the English King. Penrith, with the Forest of Inglewood, was one of the manors so assigned; and for the next half century Penrith, nominally English but practically Scottish, enjoyed peace—a luxury probably never previously experienced, and not again to be enjoyed for some centuries.

This happy state of things came to an end in 1295, when Edward I., having quarrelled with the Scottish king, regained the ceded manors, and sent the Scots back over the Borders, where, however, they would not stop, but were continually coming back, not to “Take a cup o’ kindness for auld lang syne,” but to claim outgoing tenants’ compensation, by carrying off what was movable and destroying what was not.

Next the manor of Penrith was given to Anthony Beck, the warrior Bishop of Durham, who was a terrible fellow for fighting—much more at home in the saddle clad in armour, than in the peaceful duties of a bishop.

At that time the Bishops of Durham were princes claiming to be independent of the king ; and Beck, treating a command of the king with contempt, Penrith manor was taken from him. He was, however, no loss to Penrith, for there is no record of him bringing his fighting proclivities to the protection of Cumberland.

No further grant of the manor was made by the Crown for eighty years, when in 1378 Richard II. gave it to the Duke of Brittany in exchange for Brest, that town being of value to the English King as a key to France. This arrangement held for eighteen years, when the King gave up Brest and regained Penrith, and in 1397 granted it to Ralph Nevill, the powerful lord of Raby. Nevill had married as his second wife Joanna Beauford, the King's kinswoman. He had just been created Earl of Westmorland, and appointed to several high offices of state ; amongst others he was made Lord Warden of the Western Marches, in which he held large powers, military and magisterially, for the protection of the north-west against the Scots. Then Penrith Castle would be commenced : for we know that when the manor was granted to the Scottish Kings, it was a condition of the grant that there was no castle there ; and in the time intervening between their occupation and the grant to Nevill, there is no reason to suppose a castle would be built. The grant is to Ralph Nevill and his heirs male by his second wife, Joanna Beauford.

A busy life had Penrith's feudal lord. Born in 1365, he was a warrior from his youth upwards ; a ready and efficient servant of whatever king wore the crown, without troubling himself much about whys and wherefores. He served three kings in succession without quarrelling with one of them ; he also had the great good fortune, or the clever tact, to be always on the winning side—a position ever dear to the heart of an Englishman.

King Richard II. had commenced his reign as a boy, petted and loved by the people ; but as a man he became tyrannical and unconstitutional ; and when he granted the manor of Penrith to Ralph Nevill, he was already tottering on his throne, from which in two years time he was driven by the decree of Parliament a poverty-stricken exile, never more to occupy English soil until brought to be buried in it.

This ill-fated king may be claimed as one of Penrith's notabilities, as it is undoubtedly his portrait (not a very lovely one, certainly) which is preserved in the fragment of stained glass now in the most eastern window of the north aisle of St. Andrew's Church.

The unfortunate Richard being deposed, there came from exile his cousin Henry, known as Bolingbroke, called by the decree of Parliament to reign as Henry IV.; and among the foremost to meet and welcome him when he landed was Ralph Nevill, Earl of Westmorland. Under the new king Penrith's feudal lord suffered no eclipse; he stands more nearly related to the throne than before, his countess being half-sister to the new king. He is created Earl Marshal of England, an office of great dignity and responsibility.

All through the fourteen years of Henry IV.'s reign Nevill is never at rest; what with aggressive Scots and rebellious nobles his wits never get dull nor his armour rusty. Then the king dies, and is succeeded by Shakespeare's "merry wag," Prince Hal, who now, however, becomes a discreet and valiant monarch, bent on recovering English prestige and territory in France. He is followed there by his nobles and a powerful army, foremost amongst whom is Ralph Nevill, then fifty years old, and with a prospect of a harassing campaign and much desperate fighting;—it indicates a man of immense pluck and endurance.

Rapin the historian says, "Just as Henry and his army were about to embark, intelligence was received that the Scots were meditating an invasion. A council was held, when Ralph Nevill, Earl of Westmorland and Lord President of the North, endeavoured to persuade the king to disable the Scots before going to France; but Nevill was over-ruled, and to France they went;" and the historian adds, "Cumberland was ravaged and Penrith burned."

From the terrible campaign, terminating with the battle of Agincourt, Ralph Nevill returned with the small residue of victorious English warriors. And now he appears as if he thought he had had enough of that kind of thing. And at a time when the soldier's regimental tailor was a blacksmith, and he fought in an iron uniform, with his head in a metal cupola, thirty years of it was enough even for a Nevill; so he retires from military life, but

continues to take a prominent part in the civil administration of the affairs of the north until his death in 1425, at the age of sixty.

Ralph Nevill had two families: nine by his first wife, and thirteen by his second, the youngest of the latter being Cicely, a great celebrity not only of her time, but for all history. She was a great favourite of the Londoners, who styled her "proud Ciss, the Rose of Raby." Her portrait in stained glass in the third window from the west of the south aisle of Penrith church, is said to be the only portrait of her extant; it is a brilliant piece of stained glass, worth many times its weight in gold. In it the illustrious lady looks every inch a "proud Ciss;" her head is clad with jewels, and the portrait gives one the idea of a matronly lady doing her best to preserve the beauty of the once blooming "Rose of Raby." This relic of mediævalism entitles us to claim Cicely as the belle of Penrith notabilities. She was married to Richard Plantagenet, Duke of York, whose portrait is in the same window with that of his wife. Richard was in point of direct succession the rightful heir to the crown; but the Lancastrian branch, whose hereditary claim was less distinct, held the crown by Parliamentary decree, and out of this complication sprang the terrible Wars of the Roses, as the series of bloody conflicts between the rival houses of York and Lancaster is designated.

The life of Cicely, Duchess of York, was indeed a wonderful one, being by her mother's side a great-grand-daughter of Edward III., she had royal blood in her veins. As wife of Richard, Duke of York, she was near the throne, of which at one time her husband appeared almost certain; but the cruel vicissitudes of war more than once placed her in dire distress. At the disastrous battle of Wakefield, her illustrious husband and devoted brother, the Earl of Salisbury (who had succeeded to the manor of Penrith) were executed on the battle field, and her son Edmond butchered in cold blood by the ruthless Clifford; and when at length her dark days were past, and her two sons, Edward and Richard, occupied the throne in succession, she had scant pleasure and no credit in either of them. Cicely was daughter, sister, aunt and mother of four successive lords of Penrith manor, all men of celebrity, whose

career extended over a century, and whose occupation of the manor covered eighty-six years.

Moreover, she was mother of two kings, grandmother of Henry VII.'s queen, and consequently ancestress of all the English monarchs from Henry VIII. down to Queen Victoria. Her lifetime was a remarkable epoch in the history and civilization of England. When a girl, books were written by hand, and were so scarce, that it is on record that her mother petitioned the court for the return of a book she had lent to the late King Henry V. During the reign of her son Edward printing was introduced; and in the short reign of her son Richard the laws of the land were first printed. She witnessed the downfall of feudalism, its enormous power having been turned against itself in desperate conflict for the supremacy of two rival monarchical dynasties; and out of the ruins of the feudal system she saw the rise of the supremacy of the English middle classes.

Two years after the miserable death of Cicely's son George, the ill-fated Clarence, done to death by his brother the besotted fourth Edward, she retired to her castle of Birkhamstead, and there for fifteen years lived the life of a nun, until in 1495, in probably the eightieth year of her age, she left this (to her truly) troublesome world.

After the death of Ralph Nevill, in 1425, the manor was held by his son Richard, Earl of Salisbury, until the last day of 1460, when at or just after the disastrous battle of Wakefield he was executed by martial law, and his family attainted by Henry VI. This—for the time—crushing defeat of the Yorkists, however, only lasted until the following Palm Sunday, when the great battle of Towton gave final supremacy to the House of York, and placed Cicely Nevill's son Edward on the throne.

Salisbury's son Richard, Earl of Warwick, was heir to the manor of Penrith, to which he succeeded on the reversion of the attainder by Edward IV.; but whether in consequence of the attainder a new grant was necessary, may perhaps be a moot point. Warwick, known in history as the king-maker, got his title and immense possessions by his marriage with the heiress of the former Earl of

Warwick. He possessed one hundred manors; thirty thousand persons were fed daily at his tables; and when at court, his six hundred attendants bearing on their livery the Warwick badge of the bear and ragged staff, overawed London.

While the king-maker held the manor of Penrith and the office of Lord Warden of the Marches, Penrith would probably see much of him for the first few years at least, whilst King Edward IV. occupied the throne upon which the great Warwick had placed him; a peace, however, soon to be broken by another desperate attempt to regain power by the House of Lancaster, when Warwick, for reasons as yet ill understood, deserted his own kindred of the House of York, and carried his immense power over to the rival House of Lancaster, drove Edward from the throne, and set up once more the old Lancastrian King Henry VI.

Another turn of the wheel, and the desperate battle of Barnet crushes for ever the Lancastrian cause. Warwick is slain, his immense estates confiscated, and his mighty career terminated for ever.

Thus ended the ten years reign of the bear and ragged staff in Penrith. The manor now reverted to the crown, and was given by King Edward to his brother Richard, Duke of Gloucester, who for the next twelve years was a power in the north of England, residing at times at the castles of Carlisle, Penrith, and Barnard Castle, as well as being much in Yorkshire. He appeared to be ubiquitous, and all-powerful; and notwithstanding the odium afterwards attached to his name in the south, nothing but good was known or believed of him in the north.

Doubtless they were palmy days for Penrith when the white boars of the Duke of Gloucester replaced the bear and ragged staff of the traitor Warwick; and when the Gloucester Arms were set up at the castle hostlery in Dockray, which perhaps was before the Warwick Arms.

When after one short year's reign as Richard III. this extraordinary man was treacherously betrayed and butchered on the battle field of Bosworth, the connection of Penrith manor with national history came to an end,

BISHOP STRICKLAND.

The earliest on record, and—the conditions of the time considered—the most judicious and munificent of Penrith's benefactors, was William Strickland, who was Bishop of Carlisle from 1400 to 1419. He conferred three great benefits upon the town, each peculiarly suited to the exigencies of the time.

He built a tower to the castle—or as the initial erection of the castle afterwards built—for we can scarcely think he could have built it after the manor was given to Ralph Nevill, whose first duty it would be to commence the erection of a castle. The tower was known as the Bishop's Tower, and also as the White Tower, being constructed of white stones.

Dixon, in his pamphlet of 1821 on Penrith Charities, says this tower remained in an almost perfect state of preservation until about seventy years before he wrote, and that a painting of it then existed at Sandgate Hall, the house of Thomas Scott, Esq., afterwards of Brent House.

The Bishop's Tower was no piece of useless ostentation, but a necessity of the time, being no doubt a watch tower to enable the inhabitants of the town to keep a look out for the approach of the ever-dreaded foe from over the Borders; and by building his tower, Strickland shewed himself, in consideration for the town, to be in advance of the royal owner of the manor.

The Bishop's second good work was procuring a constant supply of running water for the town from the river Petteril. The mere work of cutting the new water course was the least important part of the scheme; he had to surmount the greater difficulty of obtaining from the riparian owners the right to abstract the water from the river; and the difficulties of the negotiation are strongly indicated by the curious stipulation—now obsolete—that no more water was to be taken than would pass through the eye of a millstone. The stream of water thus secured must have been an immense boon to the often plague-stricken and beleaguered town.

It may be only fancy, but I cannot help thinking as I look at a map of Penrith, that its large open areas, with very narrow inlets

(much narrower once than now), speak of the troublous times the town has gone through ; that these areas received the cattle driven in for refuge when the watchman on the Bishop's Tower descried the ancient enemy on the war path, the narrow inlets making defence more possible. At such times of siege the good bishop's watercourse running through the town must have proved an inestimable blessing.

This work of Strickland's, as a piece of engineering, has often been greatly exaggerated by old writers ; but in this respect Thomas Fuller, in his *Worthies of England*, carries off the palm. You will probably be surprised to learn from the worthy Thomas that Penrith is somewhat of a seaport ; he coolly asserting that Bishop Strickland at great cost constructed a canal from the town to the river Petteril, for the conveyance of boatage into the Irish Sea.

In concluding his Westmorland Worthies, Fuller makes a quaint apology, which it is certain applies equally to Cumberland, and fully accounts for both his shortcomings and his overdoings. He confidently says : "Reader, I must confess myself sorry and ashamed that I cannot do more right to the natives of this county, so far distant north that I never had yet the opportunity to behold it ; but," he adds, "time, tide, and the printer's press are three unmannerly things that will stay for no man, and therefore I request that my defective endeavours may be well accepted." Let us then kindly accept the apology ; and when Penrithians seek the gay dissipations of the Naples of the Solway—Silloth—let them not sigh for Fuller's boatage, via Thackay Beck and the Petteril, but meekly content themselves with the railway train.

The third of Bishop Stricklands benefactions was the endowment of a chantry at Penrith church with six pounds a year, that the chantry priest might teach the inhabitants grammar and music.

Now, six pounds a year may at first sight appear no great matter ; but when the value of money in the fourteenth century is considered, it was really a substantial endowment.

Mr. Walter Besant has written the life of Sir Richard Whittington—not a work of imagination such as that clever author usually delights us with, but a veritable history, dealing with authentic

data—and in order to give a just idea of the value of Whittington's benefactions, he adduces data to show the value of money at the latter part of the fourteenth century; and as Whittington and Strickland were contemporaries, the calculation applies equally to the benefactions of the latter.

From the data adduced, Mr. Besant estimates that money was then twenty-one times greater in value than at the present day; but as he says by the end of the century it was somewhat advanced, we may safely multiply Wm. Strickland's endowment in 1395 of £6 a year by eighteen times, which gives a modern equivalent of £108 a year; and if the mantle of the good bishop could but fall upon some rich shoulders now, whereby £108 a year should accrue to Penrith Grammar School, great would be the joy under the shadow of St. Andrew's church. Bishop Strickland's benefactions, it will be seen, were in their nature threefold—military, sanitary, and educational. When at the Reformation the chantries were dissolved, the preamble of the Bill provided that their revenues were to be employed for educational and charitable objects; but instead of that, they went into the pockets of greedy courtiers, or into the equally needy exchequer of the king. The Bill promised to do just what Bishop Strickland had done at Penrith one hundred and fifty years before, only Strickland did it, while the Tudor king promised but did it not; when therefore Queen Elizabeth, under pressure, refunded the £6 a year to the Grammar School, she graciously disgorged what she had no right to keep.

With the career of William Strickland as an ecclesiastic, the records of the diocese of Carlisle make us generally acquainted; but of his parentage and birthplace there is conjecture only. Camden says he was descended from a famous family in these parts, doubtless meaning the Stricklands of Sizergh Castle, near Kendal; and all other writers on the subject have followed Camden's lead, and with more or less positiveness have stated him to belong to that family.

This family had in early times settled at Strickland, in the parish of Moreland, and had adopted the name of that manor as the family name, as was usual in those times.

In 1239 the Strickland of the day married Elizabeth Deincourt, heiress of Sizergh, and settled there; and from that time to the present there has been an unbroken line of Stricklands at that place. The Cumberland and Westmorland Antiquarian Society visited Sizergh last year, when Mr. E. Bellasis, Lancaster Herald of H.M. College of Arms, read an interesting paper on the Stricklands, which, with a pedigree chart, will be published in the forthcoming "Transactions" of that Society. Being desirous of obtaining some biographical account of Bishop Strickland, to find out if possible to what circumstances Penrith was indebted to his consideration, I wrote to Mr. Bellasis asking for particulars. It so happened that my letter reached him at Sizergh, where he was visiting at the time; and from there he kindly replied, surprising me with the fact that William Strickland's connection with the Sizergh family was only suppositious. He says, "I am sorry to say there is nothing here (Sizergh) bearing on Bishop Strickland of Carlisle. He is supposed to be a member of the Sizergh people. Sir R. Bigland, Garter at the College of Arms last century and this, notes him as son of a Robert Strickland, whose father, Sir William Strickland, married Miss Deincourt. Making these latter the Bishop's grandparents, puts him rather earlier as to dates than we should expect.

"Phillippe's *Yorkshire* makes a Thomas to be the Bishop, which is of course an error; but the position assigned to the Bishop herein as a son of Sir Thomas Strickland and Cicely Wells fits in better chronologically were there any William among Thomas and Cecily's sons, which no pedigree asserts there to have been. All this will be noted on the chart pedigree of S. now printing for our local Archæological Society. I am sorry that there should be conjecture only as to the Bishop's place on the tree. I have seen no proofs as to his position thereon."

Mr. Bellasis gives me another interesting item about the Bishop. He says, "I observe that St. George's Westmorland 1615 visitation makes a daughter and heir of Bishop Strickland marry a Lancaster, and the Strickland quartering is put in." Mr. Bellasis adds, "I should have questioned this; later Lancaster pedigree say no more about it armorially or genealogically."

Now, where all is conjecture only, there can be no harm in hazarding two or three conjectures more. First: He may not have been a born Strickland at all, but only a native of Strickland, who on coming into public life was known as William of Strickland, in accordance with the general custom of the time. Secondly: He may have been a Strickland from a distant branch struck off from the old stock before the main family settled at Sizergh, the Bishop's family remaining in this neighbourhood. Thirdly: Notwithstanding the absence of documentary evidence of the fact, he might have been the son of Sir Thomas Strickland and his wife Cicely Wells of Sizergh, which fits in well enough chronologically with the known dates of his various preferments, supposing him to have been between twenty-five and thirty years of age when made rector of Stapleton, and from seventy-five to eighty at his death. The absence of his name from the archives of Sizergh, and his evident attachment to this neighbourhood, may possibly be accounted for in this way. The manor of Hackthorpe belonged to the Stricklands, and was settled on Cicely Wells on her marriage with Sir Thomas; and the possession of the manor carried with it the right of alternate presentation to the rectory of Lowther. Possibly then Cicely's son William, when a boy, might be sent to Hackthorpe to be educated and trained for priestly duties by the rector of Lowther; and then to bring in the little bit of romance about the alleged daughter who was married to a Lancaster (presumably of Sockbridge), we may suppose that William, forsaking his priestly intentions, fell in love with a fair heiress on the banks of the Lowther or Eamont and married her; lost her early; was left with a baby daughter; returned to his first love—the Church, and took holy orders; in this way he may have become owner of those lands at Penrith out of which Burn and Nicolson say he endowed his chantry at Penrith. And may he not have built his watch tower upon his own land, before the Nevill's acquired it as a site for Penrith Castle.

It is difficult, however, to reconcile the Bishop's entire isolation from the archives of Sizergh with the supposition that he belonged to that family. Again, his devotion to the see of Carlisle, instead

of that of Chester, in which Sizergh was then situate, favoured the idea that he was locally a Penrith man. In the pages of Burn and Nicolson, we first meet with him in 1368 exchanging the rectory of Stapleton for that of Ousby, the nearest location to Penrith we find him occupying. He held Ousby, however, only a few months.

It is to be noted in Nicolson and Burn that the adoption of native place names for surnames was especially practised by the clergy of Strickland's time; thus at Stapleton we find John de *Stapleton*, Robert de *Bolton*, John de *Kirby*, and at Ousby Adam de *Appleby*, Thomas de *Caldbeck*, William de *Wilton*, Richard de *Ulvesby* (Ousby), and Thomas de *Kirkland*, while Strickland's ordinary and patron was Thomas de *Appleby*. It is therefore evident that his bearing the name or designation of de Strickland is in itself no reason for assigning his origin to Sizergh. There is no evidence that Strickland was ever vicar of Penrith; but as there is a blank in the list of Penrith vicars from 1355 to 1428, it is possible he may have held the living between his leaving Ousby in 1368 or 1369, and his appointment as chaplain to Bishop Appleby, which position he occupied before that Bishop (1388) presented him to the living of Horncastle in Lincolnshire, then attached to the see of Carlisle.

In 1395 he was elected by the Chapter of Carlisle to be Bishop, but was refused by the Pope, who would have none but foreign priests for English bishops. He was again elected in 1400, when by intercession of Henry IV. he was accepted by the Pope.

Bishop Strickland had the same liberal hand for Carlisle as he had for Penrith. He built the cathedral tower, and furnished it with four bells; he gave the choir stalls and tabernacle work; and built a tower at Rose Castle, which long continued to be known as the Strickland tower.

As before mentioned, Strickland was contemporaneous with Sir Richard Whittington. He would probably be born twenty years before Whittington, but died only four years earlier. Both employed their means in works of philanthropy and piety, each according to his means, the one as a city millionaire, the other as a

country gentleman. Each founded a chantry. Whittington's chantry priest, however, had only the duty of praying for departed souls. The Bishop did better with his, giving him something useful to do for the living, and making it worth his while to do it.

Bishop Strickland died in 1419, and was buried in the north aisle of Carlisle cathedral, where is, says Dr. Todd, his portraiture elegantly cut in stone and gilded.

Bishop Kennet says he was a very worthy Bishop, influencing the peace and happiness of the north by his residence in these parts, and leaving the best sign and effects of it.

THE HUTTONS OF HUTTON HALL, PENRITH.

THIS ancient family occupy a prominent place in the Notabilia of Penrith. They can be traced back to Adam de Hotten, in the reign of Edward I., from whom there was a regular succession of Huttons at Penrith down to 1746. Hutton Hall was a mesne manor within the manor of Penrith. The only remains of the original hall is the square tower now to be seen behind the modern existing house which still bears the ancient name.

There were two other families of Hutton in this neighbourhood, probably all from the same stock—the Huttons of Hutton John, and the Huttons of Hutton in the Forest. The former became extinct in the reign of Queen Elizabeth, when the estate went by marriage to the Huddlestons.

The Hutton in the Forest family became extinct as a county family by the sale of the estate to the Fletchers, which afterwards passed by marriage to a branch of the old family of Vanes of the county of Durham.

The Penrith Huttons were ever notable men, taking honourable part in the learned professions as well as in county and local affairs.

The most ancient recorded monument in the old church is mentioned by Jefferson as having been the tomb of Thomas de Hutton and Helen his wife, temp. Henry V., which was under a south window in the chancel, their effigies being painted in the

window with this inscription: "Orate pro animabus Thomae et Elanae uxoris ejus."

In the reign of Henry VIII. the Hutton of Penrith was a John; and noting in Knight's *History of England* that a John Hutton was ambassador at Brussels in 1538, I have been seeking for proof that he was the Penrith John Hutton, but as yet I have met with no positive evidence to that effect. If, however, the ambassador was a Cumberland Hutton, it must have been he of Penrith, for the Hutton of Hutton John of that time was a Cuthbert, while the Hutton of the Forest was a William; this I gather from Burn and Nicolson.

The historical incident which brings the ambassador John Hutton before us, is a somewhat curious incident in history. That much-marrying monarch, Henry VIII., was then looking out for a fourth wife, and his minister Cromwell, an ardent favourer of the Reformation, determined if possible to give his royal master a Lutheran wife, sent instructions to the ambassadors at various courts, to report upon all eligible ladies. John Hutton, ambassador at Brussels, writes favourably of the Duchess of Milan. He says: "She is not so pure white as was the last queen, but she hath a singular good countenance, and when she chanceth to smile there appeareth two pits in her cheeks and one in her chin, which becometh her right excellently well." He gives an account of other ladies, and then goes on to say: "The Duke of Cleves has a daughter, but I hear no great praise neither of her personage nor beauty." Hutton is aware that in such ticklish affairs his frank opinion might get him into trouble, and he adds: "I have not much experience amongst ladies, and therefore this commission is to me very hard; so that if in anything I offend, I beseech your lordship to be my mean for pardon." He then advises the leaving of the further judgment to others that are better skilled in such matters. The historian adds that, the time would come when Cromwell himself would regret that he had not imitated the prudence of John Hutton, the ambassador to the Netherlands.

The dimpled Duchess was not chosen. One account says she replied that, if she had had two heads, one of them should have

been at the service of King Henry ; but having only one, she would not risk the losing of it. When she said this, I should think the two pits in her cheeks and one in her chin would be a sight worth seeing.

Surely there never was such a matrimonial bungle made as this fourth marriage of Henry VIII. Ann of Cleves, the lady John Hutton had such grave doubts about, was chosen by Cromwell for recommendation to the king ; other more compliant agents than Hutton were employed to work out Cromwell's scheme, who gave glowing accounts of the lady. Holbein was employed to paint her portrait for the king, which he did to too great perfection, for it secured the king's approval of the lady, only to increase his disappointment when he saw her after her arrival in England.

Ann was a plain, common-place person, speaking no language but her own native Dutch, of which Henry understood not one word ; and she was destitute of such accomplishments as were usual for ladies of rank. Henry was terribly disappointed, and in rage asked why they had brought that Flanders mare. He tried hard to be let off the engagement to marry her, but the matter had gone too far for that, and he married her sorely against his will. Of course the result was a speedy divorce on some hollow pretext ; and the ill-used Ann, glad to be free from so dangerous a husband, willingly went back to Flanders, with an unbisected neck and a nice little pension. Hutton, the ambassador, was well out of the mess ; thanks to his own great caution. Henry never forgave Cromwell, who fell under royal displeasure, and very shortly after came to the block.

A younger son of the same family of Huttons was a distinguished judge in the reign of Charles I., and is thus spoken of by Fuller in his "Worthies of England" :—"Sir Richard Hutton was born at Penrith, of a worshipful family ; his elder brother was a knight (he refers of course to Sir William Hutton, of Hutton Hall, Penrith). He (the judge) intended his studies for divinity, but dissuaded by the importunity of his friends—amongst whom George, Earl of Cumberland, was most eminent—he became a barrister in Gray's Inn, but in expression of his former affection for divinity, he seldom

if ever took a fee of a clergyman. Afterwards, being Recorder of York, he was knighted and made Judge of Common Pleas. In the case of ship money, though he was against the King—or rather for the Commons—yet His Majesty manifested not the least distaste, continuing to call him the honest judge.”

It is not much known that a direct ancestress of Baroness Burdett Coutts was buried in the Hutton place of sepulchre—St. Andrew’s choir of old Penrith church, as was also her daughter, Elizabeth Burdett, married to Mr. Anthony Hutton. It was in this way. Robert Burdett married Mary, daughter of Thomas Wilson, D.D., Dean of Durham, and Secretary of State to Queen Elizabeth; and from her the Baroness Burdett Coutts is lineally descended. Mary Burdett surviving her husband, was married to Sir Christopher Lowther; and her daughter, Elizabeth Burdett, was married to Anthony Hutton of Hutton Hall.

On the death of Sir Christopher Lowther, his widow took up her residence with her daughter and son-in-law at Hutton Hall, where she continued to reside until her death in 1622. She was buried in St. Andrew’s choir, and a brass plate to her memory there is recorded by Bishop Nicolson in 1704. Her daughter on the death of her husband Anthony Hutton in 1637, erected a marble monument in St. Andrew’s choir, bearing the recumbent figures of her lamented husband and herself. There were two brass plates bearing inscriptions, one to the memory of the departed husband, the other telling what the yet living wife had done. “Here lyes the portraiture of Elizabeth Hutton, the wife of the late deceased Anthony Hutton, who, though living, desired thus to be placed, in token of her union with him here interred, and of her own expected mortality.” In this case, at least, we may infer that marriage was *not* “a failure.”

It was a curious episode in a family history when Baroness Burdett Coutts’ very great aunt stood in St. Andrew’s choir (where the choir vestry now is) and contemplated her own sepulchral effigy.

The last of the family name was Addison Hutton, Doctor of Physic, who died in 1742.

Further reference to the monuments once existing of the Huttons in old Penrith Church will be made in speaking of the Church.

THE CASTLE.

IN speaking of Bishop Strickland's benefactions, reference was made to the recorded facts, that he was a landowner at Penrith, and that he built a tower at the castle. I now suggest the probability that he built his tower upon his own land, which Ralph Nevill afterwards acquired as a site for a castle, and allowed the bishop's tower to remain as part of the castle. Hutchinson believes the site to have been a Roman fort, and says the ground on which the castle stands has the strongest marks of an ancient camp of square figure, an outward fosse and agger with an inward walled rampier, of which the distinct remains are now to be seen. Camden says, "the castle was repaired out of the ruins of Maburg, a Roman fort hard by." This is of course an error, so far as Maybrough is concerned. In the first place, Maybrough is in no sense "hard by"; and in the second, it never was a Roman fort, and did not afford blocks of building stone. Camden's statement appears to confirm in a vague way Hutchinson's surmise that the site had been a Roman fort; and it is further strengthened by the fact that while the bulk of the stone used in the castle is the local red sandstone, a quantity of white stone, apparently from Blencow or Lamonby, is to be seen in the walls, especially about the south-east angle. Bishop Strickland's tower was of white stone, and with other materials there is also much white stone debris in the concrete of the interior of the walls, all appearing to indicate that the builders of the castle found this exceptional material on or near the site, ready to their hands; and that, in short, it was the material of the Roman fort.

There is much doubt as to the share that Ralph Nevill, his son, and grandson (the two Richard Nevills), and his grandson Richard, Duke of Gloucester, had in building the castle. But by whomsoever it was built, it has no claim to such antiquity as generally pertains to feudal castles. It was never a family residential place, but

mainly a fortress. It was a child of feudalisms, old-age born when that system of military despotism was becoming a thing of the past ; and when the introduction of gunpowder and ordnance was making stone walls useless as places of defiant entrenchment. Its first use was in the defence of the district against the Scots ; but afterwards, mainly as a stronghold in the hands of the House of York in overawing the adherents of the rival House of Lancaster ; and with the final overthrow of the Plantagenets in the person of Richard III. its work was done, and it sank into ruin.

In accordance with the popular idea that there could be no devastation and ruin without Oliver Cromwell having a hand in it, we are told that he bombarded and knocked down the greater part of the castle. It is, however, on record, that in Queen Elizabeth's time it was in a ruinous condition ; and Cromwell's soldiers would not be likely to waste their powder and shot in blazing away at a ruin. They might add to its delapidation by demolishing roofs to obtain lead for bullets ; but I believe the greatest destroyers of the walls were the Penrithians, who found the old castle a convenient quarry for building stones. I have myself seen some internal house walls composed of time-worn blocks undoubtedly from that source. It is true small cannon balls have been found in the rubbish of the castle, but they were more likely to have been fired by enemies of much earlier date, or to have been part of the castle's stock of ammunition.

THE PARISH CHURCH.

It was probably during the occupation of the manor by the Scottish kings—1236 to 1295—that the old church, demolished in 1720, was built. The fine massive arch spanning the entire width of the east side of the tower is distinctly of that period ; and the dedication of the church to St. Andrew, the patron saint of Scotland, although no positive proof, seems to favour the assumption. The existence of this arch shows that the tower was ritually part of the church, and not, as in some of the old Cumberland churches, a fortress or place of refuge—an arrangement indicative of peaceful times when the church was built.

There is unfortunately no record of the architectural character of the church demolished in 1720 to make way for Dr. Todd's Georgian fabric; but Bishop Nicolson, in his accounts of the condition of the church and monuments sixteen years before its demolition, in describing the monuments and church fittings, makes several allusions to parts of the church, which, being collated and fitted on to the grand old tower happily left to us, we get a rough idea of the plan of the church;—which I venture to describe as—first, a nave the width of the tower, and open to it; secondly, a south aisle of lofty dimensions, terminated eastward by a choir dedicated to St. Andrew; thirdly, the nave was terminated eastward by a choir dedicated to St. Mary, called also the Bishop's choir: this was the ritual choir or chancel, containing the altar. Dr. Todd's account of the old church is, that it was rude and unequal, as having been built at different times; that it opened into two, and had at the east end two altars, dedicated to St. Mary and St. Andrew. From Bishop Nicolson's references, it is not clear that a north aisle existed; but from some of his allusions, and from the words, "repairing the low leads," occurring in the churchwardens' accounts, I think there was a north aisle having a low lean-to roof covered with lead. Of course, between the nave and aisles there would be the usual arcades of pillars and arches.

From the Bishop's account we learn that there was a door to the south aisle, and a south door to St. Andrew's choir. We also know there was a great north door, because he refers to it in describing the position of the giant's grave.

St. Andrew's choir was devoted to the reception of sepulchral monuments, principally—perhaps exclusively—those of the Huttons of Hutton Hall, Penrith, who claimed to be proprietors of that choir.

I cannot believe there was any practical reason for demolishing the old church beyond the fashion of the period—to condemn all old Gothic work as worthless, and the rage for building imitations—many of them bad imitations—of Wren's Italian churches; and I feel sure that if Dr. Todd and Bishop Nicolson had possessed any love or reverence for ancient Gothic architecture, they would

have been able to preserve the ancient fabric. That, however, was not the feeling of the age. And so the historical old church was swept away, and with it—to complete the work of destruction—all the most important of the monuments were destroyed. The Puritan revolutionists might have been blamed for this vandalism, had we not had the painstaking account of Bishop Nicolson of the monuments in and about the church only sixteen years before its demolition; from which we learn that there was then nearly a score of monuments and brasses of great interest, only five of which can now be found—and these the least important of the number mentioned. We are therefore forced to the conclusion that the missing monuments of the ancient family of the Huttons and others were ruthlessly destroyed with the old church.

The tower of the church is of massive proportions, being at its base twenty feet square, with walls six feet thick; the top, or belfrey, stage is twenty-two feet square, with walls four feet thick, the total height from ground to top of parapet is seventy-one feet. Up to the belfrey stage it is the original 13th century tower, which has been much tampered with; some small mean windows have been inserted, and angle buttresses added, and—greatest abortion of all!—an Italian doorway and Grecian pediment stuck to the old Gothic tower. From structural indications it appears probable there was a large west window, which, seen from the interior of the church through the great arch now spanning the gallery stairs, would be a fine feature. The belfrey stage was, from the architectural details of its eight two-light windows, added in the latter part of the 15th century; and there is good reason to suppose it was built by the Earl of Warwick, when he held the manor (1460—70). The reasons for this supposition are, that upon the north-west angle of the parapet there is what tradition calls the Warwick ragged staff; and it is noticeable on examination of the parapet, that similar ragged staffs were originally placed on all four angles and the centre of each side. It may also be observed that while all other parts of the tower are of red stone, the ragged staff is of white, that being the proper colour for Warwick's staff, another nobleman having a black one. Again, the belfrey windows are of

the same character and details as some of those in the castle—in all probability also Warwick's work, for their details are those of his time. Of the eight ragged staffs it may be asked, Where are seven? To answer this, we have only to remember the odium afterwards attached to Warwick's name by the adherents of the House of York, and to imagine with what glee the Duke of Gloucester's retainers would destroy the Warwick badges. The only wonder is that even one was left; it, however, has been broken in the middle, and the point is gone. Perhaps after Richard III.'s day, someone having a grateful remembrance of the mighty Earl, restored the solitary white staff which remains to this day; and may there never be wanting an appreciative churchwarden to preserve this the last relic of the king-maker in Penrith.

THE GIANT'S GRAVE.

In connection with the old church, the "Giant's Grave" must be noticed as one of the most interesting objects of antiquity. With the all but obliterated carving upon the two crosses and the intervening hog-backed stones, and the interpretation thereof, I will not presume to deal; they are in the able hands of the Rev. W. S. Calverley, who I understand is about to give the result of his investigation thereupon. I will only here speak of the site of the monuments, and the history of the Giant tradition.

In preparing for a concrete foundation for the base stones on which the hogg-backs have just been placed, the earth to a depth of seven feet was found to consist of filled-in soil mixed with broken brick, freestone, and broken cobbles, and some shattered human bones, but none perfect. This mixture of material was uniform to the depth mentioned, and quite at the bottom was found a bit of blue willow-pattern pot; attesting the fact that to that depth the formation of the ground was comparatively modern. The excavations were made as near to each pillar as was deemed safe, and I am satisfied that the pillars are set upon the same artificial formation. The excavation was continued downward into the natural boulder clay, which had certainly never before been disturbed. The excavation showed that the earth near the western

cross was much firmer than at the eastern one, where it was a very gruesome mixture of fragmentary bones and loose earth, which had evidently sunk under the weight of the cross, the socket-stone of which is ten inches lower than that of the western cross; and if any other proof of the modern re-erection of the monuments is needed, it is afforded by the fact that the eastern cross is socketed into a rough square block of local soft red freestone the same as the church; all other parts of the crosses and hogg-backs, as also the large round socket-stone of the western cross, are of white or flesh-coloured stone from Blencow or Lamonby. The eastern cross has evidently been broken off from its original socket-stone, and re-set in the modern socket-stone in a rough and ready way by tapering the end to fit a hole much too small to receive the entire pillar—a slovenly bit of work which the original erectors of the crosses would have been ashamed of.

Both Bishop Nicolson and Dr. Todd have left it on record that the Giant's Grave was "before the great north door of the church"—of the old church. Both these great authorities recount the since often-recited romance, of the mighty hunter of Inglewood Forest, and his boars; and both dismiss the tradition, each being in favour of an hypothesis of his own. The Bishop thinks that the "two pyrimidal stones" and "the several segments of circular stones erected betwixt them," have "been erected on no other design than for an ornament (such as it is) to the porch before which they stand." Dr. Todd's idea was that the stones were put there to rest the bodies of the dead while the souls of the departed were being prayed for. Both ideas were crude, and unworthy of the learned authors. It evidently did not occur to them that the monument might be a few centuries older even than the old church itself, and that the church might have been brought to the giant's grave, and not the grave to the church. If the giant's grave, as we see it, was before the north door of the church, the door must have been considerably further east than north doors usually were placed, which was generally near the west end of the church, in fact about the position of the present north door. From all these facts, I am inclined to think that before the rebuilding of

the church, the monuments were more westward, and that while the building operations were going on, they were taken down, and afterwards re-erected where we now see them, so as to leave an uninterrupted approach to the present north door.

That the ground around the church should be of the character indicated by the excavation mentioned, need be no matter for surprise, if it is, as I suspect, the debris cleared out of the old church when getting in foundations for pillars and internal walls of the new church; for we find by the old churchwardens' books that burials in the church were regularly permitted on payment of three shillings and fourpence each. This went on up to within two years of the demolition of the old church; and it appears that during the fifty years preceding the re-building, upwards of one hundred such burials took place in the church. This abominable practice, however, was quite common in the 17th century, and in one place inspired an epitaph writer thus:—

“ Here lies I outside the dooer,
Here lies I because Ise pooer;
The further in the more to pay;—
Here lies I as warm as they.”

When the “giant” idea first came in, and from whence, does not clearly appear. Camden, in his “*Britannia*,” (1586) mentions “*Perith*,” its “pretty handsome church,” its castle, market-house of wood, beautified with bears climbing up a ragged staff, the device of the Earls of Warwick. King Arthur’s Round Table, Maybrugh, and Bishop Strickland’s water-course from the *Petteril*; but strange to say, profound antiquarian though he was, he makes no allusion to the giant’s grave.

The next writer in point of date is Sandford, who (Jefferson in his “*History of Leath Ward*,” says) wrote his manuscript history in 1670, in which he states that he was told by Mr. Page, of *Penrith*, who from 1581 to 1591 was schoolmaster, marshal-man, and bailiff, that a strange gentleman came to *Penrith* in search of antiquities, and produced a written account of a “*Sir Hugh Cesario*, a knight-errant, killing monster, man, and beast, and was buried in the north side of the church, ith green field.” Sandford

then goes on to say: "They went to the church; and on the north side ther is 2 crosses distant the lenth of a man, one at head and other at feet. And was opened when I was a scholler there by William Turner, and there found the great long shank bones and other bones of a man, and a broad sword besides, fonde there by the church wardens."

In this account it is to be noted that neither the unknown antiquarian who introduced the story of the hero of the grave, Mr. Page, or Mr. Sandford, say anything about a giant. On the contrary, Mr. Page distinctly states that the crosses were the length of a man (i.e. an ordinary man) apart. The great long shank bone does not, I think, mean more than the long bone of the leg above the knee, as distinguished from the shorter one below it. Gibson's edition of Camden's "Britannia" (1695) has "Additions to Cumberland," written by Dr. Todd four years before he became vicar of Penrith, in which the crosses—spoken of as pillars—are described as about five yards apart, and the "giant" first comes before us thus:—" 'Tis said they were set in memory of one Sir Ewan Cæsarius, knight in old time, a famous warrior of great strength and stature, who lived in these parts, and killed wild boars in the forest of Englewood, which much infested the country. He was buried here, they say, and was of such prodigious stature as to reach from one pillar to the other; and they tell you that the rude figures of boars, which were done in stone and erected two on each side between the pillars, are in memory of his great exploits upon these creatures. Thus it appears that between 1591, when the unknown antiquarian visited the monuments, and 1695, when Dr. Todd wrote about them, the grave had grown from the length of a man to that of a giant.

THE GIANT'S THUMB.

OF the ancient mutilated cross known as "The Giant's Thumb," I have spoken in a former paper (*Transactions*, No. XIII. p. 1), and will only here add, that it has occurred to me, that the origin of its popular designation may have been in the resemblance which the mutilated cross, when standing only part of its height out of

the ground, bore to the thumb bone. Did some wag of a gravedigger, accustomed to the sight of such gruesome fragments of humanity, recognise the likeness, and give the name to the old cross?

WILLIAM ROBINSON.

WILLIAM ROBINSON, a great benefactor of Penrith in the 17th century, well deserves our notice. Of William Robinson, grocer, of St. Dunstan-in-the-East, London, and his munificent benefaction of £55 a year through the Grocers' Company to Penrith, for charitable, educational, and religious purposes, every Penrithian knows much; but of the connection of the benefactor with the town, or the cause of his great regard for it, nothing is known beyond a vague tradition mentioned by Dixon in his book on Penrith charities, to the effect that when William Robinson was going as a boy to London, to try his fortune there, he was helped by kind persons in Penrith.

On looking through an old Survey of London, I came across an account of benefactions in the hands of the Grocers' Company; and looking for William Robinson's benefaction to Penrith, was surprised to find no mention of it. There was, however, one endowment by William Robinson mentioned, of £20 a year to the Grammar School at Topcliffe in Yorkshire. Now then, I thought, some clue to William Robinson may be found, so I drew a bow at a venture, and wrote a note of enquiry to the vicar or rector of Topcliffe, and received a courteous reply, that it was a fact that the Grammar School there received an annual payment of twenty pounds a year from the Grocers' Company from the benefaction of William Robinson, but of William Robinson himself nothing whatever was known; thus the beneficent grocer becomes doubly mysterious.

William Robinson's will in favour of Penrith is dated 1660, but the bequest was not to accrue until after the death of his widow, but when that took place does not appear. The churchwardens' old book takes no notice of it; for although the churchwardens received and distributed the money, they did not enter either receipt or distribution in the church book, at least for about eighty years after it first came in.

It has been assumed that the date on Robinson's school, 1670, indicates the time when the benefaction first accrued. This, I think, is a mistake. Taking the date and the inscription together, "Ex sumptibus Will. Robinson civis Lond. 1670," plainly means that the school was erected at the cost of William Robinson in 1670; and the inference I draw is, that William Robinson in his lifetime sent money to pay for the erection of the school, so as to give effect to his bequest when it fell in; and the fact that there is no provision in his will for building a school favours such a conclusion.

The bequest of £55 a year is even now a handsome one; but if we estimate it by the value of money at that time, it cannot represent less than £200; and further, as Walker in his history of Penrith says: "In Mr. Robinson's time, his property in Grub Street, the rent of which was charged with the £55, would be of much less value than at present; and had he left the property, or a certain proportion, to the parish, instead of a fixed sum, what might have been its present value?" This is only one out of hundreds of cases in which a testator in olden times bequeathed a specific sum out of property, not thinking that in course of time the value of the property might increase. An extreme case is at (I think) Rochester, where the rent of certain land, then a little over five pounds a year, was left in trust to the Dean and Chapter to pay five pounds a year to the Grammar School, the small residue of the rent to be taken by the Dean and Chapter for the trouble of dealing with the trust. The land now produces some hundreds a year, but five pounds is all that is legally due to the school—more is actually given, but the Chapter still takes the lion's share.

William Robinson also gave the sum of ten pounds to the church stock. This is not provided for in his will, and therefore if not given in his lifetime, must have been arranged for in some other way than through the Grocers' Company. The receipt of the second half of this £10 is noted in the old churchwardens' book thus: "April 23rd, 1676, £5 more of Mr. William Robinson's money, to be put forth (i.e. invested) for the use of the Parish."

As has been noticed, the old churchwardens gave no place in the church book to William Robinson's bequest and its distribution, yet occasionally indirect mention is made of it, when the weary and thirsty parish officials enter in the book—"Spent (so much) going about with Mr. Robinson's money;" or, "Spent at the George consulting about Mr. Robinson's money." As we shall see presently, the charges to the parish account for refreshments were tolerably numerous.

REMINISCENCES FROM THE OLD CHURCHWARDENS' BOOK.

THE old Churchwardens' Book is in two folio volumes, ultimately bound in one. The first commences in 1655, and contains four quires of foolscap paper, and its three hundred and thirty-five pages cover a period of one hundred and ten years; the old men cannot therefore be censured for waste of paper and ink. The paper of this book is not only foolscap in size, but is actually so, since it bears the original water-mark of the fool's cap and bells. As to the origin of the term, I have somewhere read, that the Parliament during the Commonwealth, in derision of royalty, adopted it instead of the crown. Dr. Brewer, however, who is an indisputable authority, says, "foolscap" is a corruption of the Italian *folio capo*, a term applied, he says, from very ancient times to that size of sheet.

The entries in the old book are very meagre, and consist generally of items of money received or paid; rarely indeed did the old men venture upon a remark or note not directly connected with pounds shillings and pence. A revolution or an earthquake might occur, but if it did not result in money expenditure, no notice was taken of it.

Those who studied the subject of the Puritan Revolution during the recent Oxford Extension lectures, will remember that when the old book begins in 1655, the revolution had nearly expended itself. It began with an arbitrary king trying to govern and tax the people without the interference of Parliament, and now in 1655 the wheel of revolution had gone completely round, and Oliver Cromwell, after trying various experiments in the construc-

tion of parliaments, finds himself just where King Charles was when the revolution began—without a Parliament, and trying to govern alone.

At Penrith the old vicar, John Hastie, had been ejected, and Roger Baldwin, a Presbyterian, was reigning in his stead. This we know from other sources ; but the old book never once mentions his name. There is no historical record of the date of John Hastie's ejection and Roger Baldwin's appointment by the revolutionary leaders ; but his advent was evidently quite recent, as the entries in the book bear the aspect of a new broom, just beginning to sweep very clean. The book itself was only then started, for in the list of first payments there is this item : " For this paper book with the ordinances bound therein, 5s. 8d."

The churchwardens' names for the year are old Penrith names (three of them at least) : Peter Mawson the younger, Christopher Rumney, William Cookson, and Thomas Steaphenson—the last not quite clear. The writing is of an obsolete character, and the spelling capricious and abbreviated, making the deciphering of the entries extremely difficult except to an expert.

John Hastie when ejected must have been a very old man, for he came to the living in 1600, three years before the death of Queen Elizabeth. He must have come to an almost depopulated parish ; for only two years had gone by since the fearful visitation of the plague had subsided, when it is recorded, 2,260 persons in Penrith and its neighbourhood had perished ; and hardly had he got settled in his parish, when the town and neighbourhood was harrassed by their old Border enemies, and such watching had to be kept up day and night as had not been experienced for a century before. History has often shown how soon nations and communities forget their distresses—and, phoenix-like, Penrith was well used to rising out of its ashes.

John Hastie's ministry at Penrith extended over an eventful period of English history. He saw the closing years of Queen Elizabeth's reign, the reign of James I., Charles I. reign and miserable death, and the period of the Puritan revolution. All local historians represent John Hastie as living at the Restoration,

and replaced in the living ; but the Rev. H. Whitehead proves this to be erroneous. I was led to accept the error myself, from observing the name of John Hastie in the list of debtors to the parish stock up to 1661 ; but that was evidently another John Hastie, perhaps son of the old vicar.

Returning to Roger Baldwin and the old book, we find in the first list of receipts from interest on the church money lent out, called "use money," two or even three years' arrears are got in, apparently as one of the results of Roger Baldwin's clean sweeping. On the other side of the account there is a heavy expenditure for repairs of the church, and a general putting in order of things parochial, shewing that the old parish church was being well cared for under Puritan rule. I have always supposed that Puritans of that period had a great aversion to church bell ringing ; I suppose I must have got wrong information, for the very first item of expenditure is for new ropes for the chimes, and various items for mending the fittings of the five bells then in the tower.

A curious page in the year 1655 is an account of fines. It is headed, "Recd. of Thomas Langhom, Esqr., justice of the peace for the county, as penalties inflicted upon several offenders, to be distributed to the poor people of the parish." These fines are for Sabbath-breaking, swearing, and drunkenness, and vary from one shilling to half-a-crown.

Some of the offenders are from neighbouring places—Greystoke, Lowther, Askham, and Plumpton. These must have been dropped upon on market-days ; consequently, under Puritan rule, the market-day people had to mind their P's and Q's when they came into Penrith. The ladies did not escape : one offender, Ann, the wife of William Davison, had to pay a shilling for swearing. Now a shilling was then no trifle ; for a skilled mechanic's wages for a day was a shilling, and a labourer's eightpence ; therefore, if Ann's husband was a mechanic, she would begin to think when a whole day's wages went, that swearing was likely to become an expensive luxury.

There was, it appears, a custom for well to do people to pay what one may call a mortuary tax. On the death of a member of

the family, a sum of money—generally ten shillings, sometimes more—was given for distribution amongst the poor. In this year (1655) it is recorded, that Sir Thomas Sandford of Howgill Castle gives £2 10s. od. on the death of his child at widow Fallowfields in Penrith. These voluntary benefactions and fines were distributed to the poor in sums of from fourpence to a shilling. These benefactions are distinct from mortuary fees to the priest on the death of a head of the family.

Roger Baldwin's first year at Penrith parish church closes with a list of church properties to be handed over to the succeeding churchwardens; and a very characteristic list it is, as the following items will show. "One large bible. Sundry paper books of church accounts and transactions. One green cloth for the communion table. One linen cloth for the same. One pewter flagon. One silver bowl with a stand for it. One shovel, one spade, one rake. One long post of wood in St. Andrew's choir. One wood pan for casting of lead;"—this must mean a wood trough or shallow box to hold the sand upon which sheets of lead for the church roof were cast; for at that time, and for long after, rolled sheet lead was unknown, and all roofing lead was cast in sand. I have seen such cast sheets taken out of old houses in Penrith: they were very heavy, and of irregular thickness.

The inventory mentions certain bonds for church stock lent out, and for apprentices' indentures; for the vicar and churchwardens had the paternal duty of paying for the apprenticing of boys to trades. The fee paid was three pounds; and occasionally a further sum for an outfit of clothes. They also had the (to our notions) anomalous liability of paying premiums for the destruction of foxes, ravens, magpies, and other predatory animals. In 1658 we have an entry of this sort: "Paid for killing a fox, 2s. 6d." Orthographically this fox is a curious animal—he is spelt "ffoxx," and so has two heads and two tails.

Another curious item of expenditure is whipping of dogs out of the church, for which service two shillings is annually paid for many years. This was not peculiar to Penrith; indeed, it was a general custom, and the dog whipper was quite a parochial institu-

tion. The intrusion of dogs into churches gave rise to the closing in of the communion table with close rails and gates; and bishops in their charges not unfrequently pressed upon churchwardens the necessity for providing such close enclosures to the communion table.

In *Notes and Queries* a short time ago a dog-in-church legend is given; it says, once upon a time a dog entered the church of St. Crux at York and stole a consecrated wafer. He was pursued and slain in that part of the street called Colliergate. The sacreligious act excited general indignation, and either by civic ordinance or licensed custom it became the practice of the town boys to have an annual whip-dog day in that street, which in this way gradually acquired the name of Whipma Whipmagate.

After the year 1655 parish affairs, like those of the nation, are in a state of chaos. The following year there is only an account of eight mortuary gifts to the poor, amounting to £3 13s. 8d., and its distribution amongst one hundred and seventy-three poor persons.

For the next two years there is no entry of receipts or expenditure. Two blank pages were left, probably to receive them, but they were never filled up. In 1658, the year of the Restoration of the monarchy, the accounts are resumed by three churchwardens, Richard Hyndson, John Clarke and Henry Smith, continued in 1659 by Bowerbank, Rayson, and Martin, in 1660 by Nelson Curwen and a name something like Beadman, in 1661 by a Simpson, Robinson, Clarkson, and Jefferey Blamire. I note these names as they are mostly old Penrith names.

From the commencement of the book in 1655, a vicar's name is not mentioned until we come across this entry: "The 18th day of April, 1663. We, the Minister and Churchwardens for this year, with the consent of Mrs. Elizabeth Hutton, conjointly and unanimously agree to the binding of John Steward an apprentice with the money paid by the said Mrs. Hutton. Signed, Simon Webster, vicar, (and, bracketed together as churchwardens) Edward Page—his mark, Richard Shepard—his mark, Charles Carter—his mark, Launcelot Harrison—his mark."

Of course there were no School Boards in those days, yet all the same, four churchwardens *all* marksmen was a curious incident.

The principal source of churchwardens' revenue was a capitation tax called "powle pence" (poll pence). In 1661 this amounts to £3 19s. od., representing nine hundred and forty-eight payments of one penny presumably on all adults.

This poll pence appears to have been the precursor of church rates or assessments on property. The last collection of poll pence was in 1682, when it produced £4 5s. 10d. Afterwards we find the revenue to be derived from "assessments laid." This appears to be the commencement of church rates, in Penrith at least. In 1687 the tower roof was newly laid with lead, and an assessment made yielding £27 14s. od.

In 1671 there is a note not very intelligible, but to the effect that the church plate and linen is all gone; and in 1678 we find a subscription list for new plate and linen in sums from ten shillings down to one penny, producing £9 1s. 8d.

About this time the name of Robert Wilson occurs several times in the book; no doubt the Robert Wilson mentioned by the Countess of Pembroke as postmaster and wine merchant. In February 12th, 1676, the venerable lady writes: "In the morning did I see Mr. Robert Wilson of Penrith, paid for a rundlet of sack; but I was very angry with him because I thought it too dear, and told him I would have no more of him; and then he slipped away from me in a hurry."

It was a pity Robert should have been so crusty with the good old Countess. Mrs. Wilson evidently thought so too, and tried to make peace, as we find the Countess writes, March 2nd, "And this day there dined without in the painted room with my folks Mrs. Wilson of Penrith, and after dinner I had her into my chamber and kissed her (Countesses don't kiss tradesmen's wives now-a-days), and took her by the hand, but I told her I would have no more wine of her husband, because he used me so badly, and then she went away." Mrs. Wilson would long remember the kiss and grasp of the hand, for on the 22nd of the same month the venerable Countess died.

To return to the old book. There were no less than five vicars at Penrith in seven years; but in the year 1669 a very worthy man—John Child—was appointed, who held the living doing his duty faithfully for twenty-three years. After him, for five years, there was a Mr. Farrington; and in 1699 a new era in parochial life began, by the collation of the learned and indefatigable Dr. Hugh Todd, who immediately became a power in the parish. Dr. Todd was born at Blencowe about 1660, was educated at Queen's College, Oxford. He was learned as a divine, and accounted a great authority as an antiquarian. He was a prebendary of Carlisle Cathedral as well as vicar of Penrith. On coming to the living he at once took in hand the Grammar School and instituted many reforms and renovations, as the school account book kept by himself plainly shows. The Doctor was evidently a stickler for church discipline, as a result of which there is in the churchwardens' book a note in the Doctor's own well-known hand, which one finds it difficult to believe could have occurred so late in Protestant times. This is it: "May 12, 1700. Susana Henderson was relaxed (i.e. relieved) from excommunication, and performed penance according to the canon. The congregation gave in charity to her (bastard) child 8s. and 10d., it being sick, and she poor." It appears then, that the ancient rag of priestly tyranny—excommunication—was still occasionally brought out, and seven years later Dr. Todd himself got a taste of it, for the bishop excommunicated him.

Jefferson's account of it is this. In the year 1707, on the appointment of that fiery spirit, Dr. Atterbury, to the deanery of Carlisle, Dr. Todd became involved in a most unhappy dispute with Bishop Nicolson, who at length suspended him and then excommunicated him. The Doctor petitioned the House of Commons, who allowed him to be heard by counsel. We hear nothing, however, in his case about penance, as in that of poor Susana Henderson. Bishop Nicolson and Dr. Todd were, however, soon after on the most friendly terms, and the Doctor none the worse for the Bishop's ban. Dr. Todd's great work at Penrith was the building of the present church, which occupied his great energies for several years, and was completed in 1722.

In the year 1710 the church stock amounted to £174; and at the head of the borrowers stands Dr. Todd for £20. This appears curious; but five years after comes the explanation. "Dr. Todd's arrears was all applied to the alteration of the Free School"; and evidently the capital sum of £20 went the same way, as it disappears from the book. Clever Dr. Todd!

The particulars of the rebuilding of the Parish Church are so well known that I need not repeat them now. Negotiations for the scheme commenced in 1716, and the church was completed in 1722; but in the churchwardens' book no direct mention of it is to be found. There are a few items of expenditure for postage, paper, and parchment which no doubt refer to it, as also do some of the very numerous charges for drink about that period, when the churchwardens appeared to think that their chief duty was to drink, and make the public drink. Such items are defined as—"Ale at the cross," and "Spent at night," or "Spent when distributing Wm. Robinson's money." Here are two typical items, in 1717. "To Mr. Wm. Rowell for expenses, distributing Mr. Robison's charity and several times consulting about brief, and writing letters by Dr. Todd and Mr. Pattinson's orders, 16s. 8d." "To Mr. James Webster for expenses at cross and with the company rejoicing for the victory over the Turks, 18s. 8d." For the year 1716, out of the year's expenditure of £22 6s. od., the sum of £6 6s. 4d. went in "ale at the cross" and "spent at night;" £6 16s. 3d. is expended for wine, besides sundry charges for tar barrels. These were very wet years indeed in Penrith, and Dr. Todd does not seem to have found any musty old ecclesiastical canon condemning the practice, but, on the contrary, appears to have looked on approvingly.

The first time the churchwardens mention the new church is—"In 1722, Treated Mr. Stubbs when he preached the first time in the new church." Several strange preachers are also treated (i.e. their expenses were paid).

In 1725, thirty items for drink and tar barrels, amounting to £6 6s. od. In 1728 Dr. Todd died, but no mention is made of the event; but several strange preachers are "treated" that year

and the next—doubtless during the Doctor's illness and the interval between his death and the collation of his successor, John Morland.

The loyalty of the Penrith churchwardens was enormous ; the expression of it being limited only by their ability to procure church money for "ale at the cross" and "tar barrels" for bonfires, and for "spending at night" ; and during the second quarter of the 18th century no occasion was lost for a display of exuberant spirits in this way.

A few years ago it will be remembered we were a little startled by observing a new sign board erected in the Penrith market-place defining the premises to which it was attached as a "bibulous emporium" ; whereupon much discussion arose as to the significance of the novel term. Nobody then seemed to know that it was only an old hereditary disease breaking out afresh with a slight change of symptoms—for had not Penrith market-place been a veritable 18th century "bibulous emporium?"

Of course the 5th of November was the great orgie of the year, when ale at the cross and tar barrels were in greatest force ; and probably that accounts for the strong traditional feeling in the popular mind for fiery demonstrations on that day, which have of late years given the police authorities so much trouble. About thirty years ago an attempt to suppress the practice produced something like a riot.

The old bibulous propensities received a mild check in 1750, when there appears for the first time in the churchwardens' book a minute apparently of a vestry meeting, although it is not so stated. It runs: "Penrith, July 9, 1750. It is hereby agreed that no sum or sums of money expended on the usual rejoicing days be for the future charged on account of the parish, except the expenses of the bonfire and the ringers and the ale which shall be then drunk at the cross." To this thirteen signatures are attached. The exception, however, allowed in the agreement was so fully taken advantage of, that little difference can be observed in the cost of rejoicing days ; perhaps there was less "spending at nights" charged in the book afterwards.

It is seen from some entries of expenditure, that when the church was rebuilt, the roof was covered with the local thin flags known as red slates. The old church had been covered in the same way, and caused the continual expenditure called in the old book "mossing the church," that is, stuffing the interstices between the flag stones or red slates with moss to keep out wind and snow. The old church red slates had been used again upon the new church, and their excessive weight proved too much for the roof timbers, which were of old second-hand beams—tradition says, from Brougham Castle, which was about that time dismantled and the materials sold. Some of the principal rafters broke, and caused the roof to spread, forcing the south wall and pillars out of perpendicular. In 1758, the book records that the centre roof was repaired and re-slatted with blue slates at a cost of £86 16s. od.; and in 1781 the side roofs were treated in the same way at a further cost of £66 16s. od. These expenditures, amongst many others up to the present day have shown that Dr. Todd's builders set themselves too much to accomplish for the money; neither the materials used nor the details of construction being up to the standard of excellence required for a church of the size and style attempted.

In 1764 particulars of the new ring of bells are fully stated; all of which have been given to the public by the Rev. H. Whitehead more fully than I can attempt.

I will conclude these rambling notes of Old Penrith by noticing a townsman of the last century, Mr. James Clarke, land surveyor, and host of the Swan Inn. In 1787 he published a Survey of the Lakes of Cumberland and Westmorland, together with an account historical, topographical, and descriptive of the adjacent country. In it he gives a map of Penrith, which is the earliest I have met with, and is interesting as showing what changes have been made in the town within the last hundred years.

Mr. Clarke gives a cheery and glowing description of Penrith and its society in his time, and with it I will conclude.

"Though an inland town, there are some very considerable manufactories of checks, which are daily increasing; two common

breweries in good employ; two hair merchants, who, (limited as their business may seem to be) are both men of property; and a tannery, where some business is done. Yet, as these employ but a small portion of the inhabitants, perhaps the manners of no place are more strongly or generally stamped with the marks of ease and peace. Few are rich, but as few are miserably poor.

“Whoever wishes to enjoy a social glass is seldom at a loss for a companion (here mine host of the Swan comes to the front). A regular card assembly during the winter, and small though agreeable private parties all the year round, furnish the fair sex with ample amusement; whilst two well frequented bowling greens afford during the fine weather exercise and amusement to such of the males as have no better employment. During the races and assizes, a more gay and agreeable place cannot be imagined; the more than usual bustle of those times rousing the inhabitants out of that placid dream of existence they at other times enjoy, and animating them to a degree of real mirth and festivity rarely met with in more populous places.”

Who does not wish he had lived in Penrith one hundred years ago?





3 JUN. 92

TRANSACTIONS

OF THE

Cumberland and Westmorland Association

FOR THE

Advancement of Literature and Science.

No. XV.—1889-90.

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:

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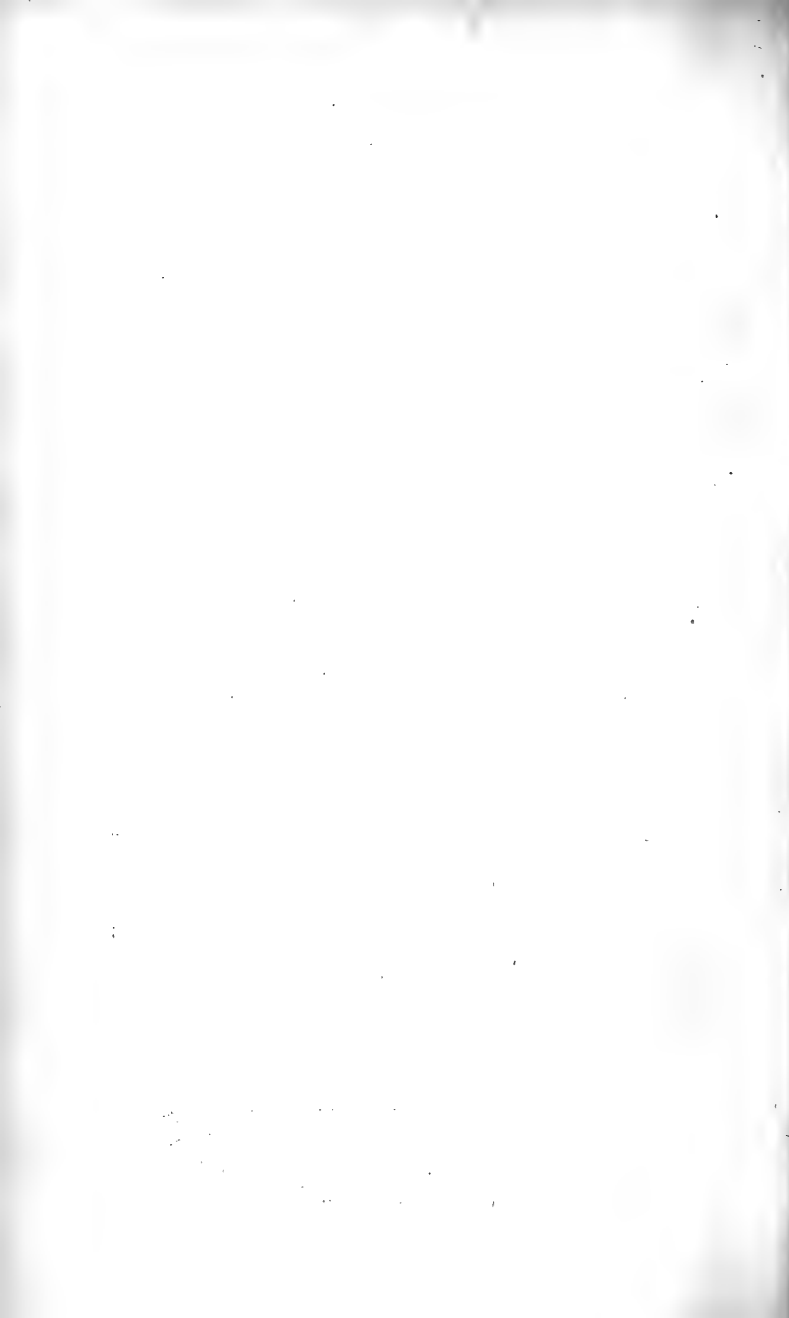
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C O N T E N T S.

	Page
PROCEEDINGS AT THE ANNUAL MEETING AT AMBLESIDE	v.
RULES	vii.
LIST OF OFFICERS	x.
ADDRESSES OF HONORARY SECRETARIES OF THE SEVERAL LOCAL SOCIETIES	xi.
LOCAL SUB-COMMITTEES	xii.
MEMORANDA FOR MEMBERS	xiii.
LIST OF ASSOCIATION MEMBERS	xiv.
REPORTS FROM THE ASSOCIATED SOCIETIES	xv.
REPORT OF ASSOCIATION SECRETARY	xxvi.
TREASURER'S ACCOUNT	xxxi.
PRESIDENT'S ADDRESS: "Some of the Changes of Social Life in England during the last Sixty Years." By the Right Rev. The BISHOP OF BARROW-IN-FURNESS	87
PAPER READ AT THE ANNUAL MEETING:—	
"The Deposits of Metallic and other Minerals surrounding the Skiddaw Granite." By JOHN POSTLETHWAITE	75
PAPERS COMMUNICATED TO THE SOCIETIES, AND SELECTED BY THE ASSOCIATION COUNCIL FOR PUBLICATION:—	
"The Study of Lichens, with especial reference to those of the Lake District." By J. A. MARTINDALE (Ambleside)	1
"Simon Senhouse, Prior of Carlisle." By Rev. J. I. CUMMINS, O.S.B. (Maryport)	25
"Old Roads and Paths." By F. HARRISON (Carlisle)	35
"The Identification of the Roman Stations in Cumberland." By J. B. BAILEY (Maryport)	45



PROCEEDINGS AT THE ANNUAL MEETING.

THE FIFTEENTH ANNUAL MEETING of the Association was held this year in the Lecture Hall, AMBLESIDE, on Tuesday and Wednesday, July 1st and 2nd.

The proceedings of the first day commenced at 1-30 p.m., with a Council Meeting presided over by the President, the Right Rev. the Bishop of Barrow-in-Furness. The Annual Report and Balance Sheet having been read by the Hon. Secretary (Mr. J. B. Bailey), were then thoroughly discussed and adopted. The general position of the Association was considered to be very satisfactory, and hopes were expressed that the various Local Societies would be able during the next session to consider the various points raised in the Report, and communicate the results to the Hon. Secretaries. If this could be done, it was felt that such united action would be greatly to the advantage not only of the Association, but also of the Local Societies. Various matters connected with the *Transactions*, the Library, and the furtherance of Science Teaching, were also discussed.

At 2-15 p.m. the President delivered his address, the subject being, "Some of the Changes of Social Life in England during the last Sixty Years." A hearty vote of thanks having been accorded to the President for his able and interesting address, the Rev. C. H. Chase, in the unavoidable absence of F. M. T. Jones, Esq., President of the Ambleside Society, addressed a few words of welcome to the members present. He was sorry that there was so small an attendance, but the exceedingly inclement state of the weather was undoubtedly answerable for it. The general business of the Association was next proceeded with, the various Reports, etc., being taken as read. Hearty votes of thanks were then accorded to the President, on the motion of the Rev. C. H. Chase, seconded by Mr. Healy, and to the Hon. Secretaries, Editor, and Recorders, on the motion of Mr. Fleming, seconded by Mr. Atkinson.

On the motion of the Rev. H. A. Macpherson, The BISHOP OF BARROW-IN-FURNESS was re-elected to the office of President, after which all the other Officers and Sub-Committees were also re-elected, together with the following Association Members.

Life Member.

BISHOP OF BARROW-IN-FURNESS,

Annual Members.

R. A. ALLISON, Esq., M.P.
 Rev. F. H. J. McCORMICK, F.S.A. (Scot.)
 J. ROBINSON, Esq., C.E.
 W. DILLON, Esq.
 Dr. W. R. PARKER.

The selection of the place for next Annual Meeting was discussed, and left in the hands of the General Sub-Committee, but it was understood that the question of localizing the Annual Meeting be considered.

At 3-30 the following papers were read, viz:—"The Rarer Birds of Westmorland," by the Rev. H. A. Macpherson, M.A.; and "The Deposits of Metallic and other Minerals surrounding the Skiddaw Granite," by J. Postlethwaite, Esq., F.G.S.

The second session commenced at 7 p.m. In the unavoidable absence of J. G. Goodchild, Esq., who had been announced to deliver a lecture on "Humming Birds," the Rev. H. A. Macpherson, at very short notice, kindly undertook to deliver a lecture on "The Migration of Birds," after which refreshments were served out in an adjoining room; Dr. G. H. Bailey giving such as cared, the opportunity of tasting tea sweetened with saccharine.

The next lecture was entitled "Some Recent Advances in Science," by G. H. Bailey, D.Sc., Ph.D., lecturer to the Victoria University.

The usual votes of thanks were awarded to the lecturers on the motion of Mr. C. W. Smith, seconded by Mr J. Holland, and the first day's proceedings closed with a vote of thanks to the President, on the motion of Mr. J. B. Bailey, seconded by Mr. J. Bentley; also to the President and Committee of the Ambleside Society for the admirable arrangements made for the Association Meeting.

On Wednesday, the weather having cleared up, an Excursion was made to the Thirlmere Water Works, thrown open by the kind permission of the Mayor and Corporation of Manchester. The party, which was under the very efficient guidance of E. P. Hill, Esq., drove from Ambleside to Bridge End farm, near the north end of Thirlmere, where the work at the dam, and the boring machines in the tunnel, were inspected. Thence they drove to the south end of the lake, and examined the straining well, the south end of Dunmail Raise tunnel, and the stone-breaking machines. A very pleasant excursion was brought to a close at The Nook (Rydal Park), where the syphon well was inspected.

It is needless to add that Mr. Hill greatly added to the interest of the excursion by his lucid explanation of all the details connected with the working of the Water Works. Hearty votes of thanks were accorded to the Mayor and Corporation of Manchester, and to Mr. Hill.

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. Such members shall be termed “Association Members.”

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, two Secretaries, an Editor, a Librarian, and of ordinary members, two to be elected by each affiliated Society. The President, Secretaries, Editor, and Librarian shall be elected annually at the Annual Meeting, and shall be capable of re-election. The Recorders shall be ex-officio members of the Council.

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.—Association Members pay the sum of 6/- annually, or they may compound for their subscription for life by a payment of £3 3s. od. in one sum.

12.—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.

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

14.—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 Sixteenth ANNUAL MEETING will be held in the Summer of 1891, 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 Secretaries, J. B. BAILEY, Esq., Eaglesfield Street, Maryport ; or H. L. BARKER, Esq., Sunnyside, Silloth.

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SUBSCRIPTIONS ARE DUE—

Association Members	January 1st.
For Transactions	February 1st.
Lecturer's Fee	February 1st.
Capitation Fee	April 1st.

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NOTICES RELATING TO BOTANY to be sent to Wm. HODGSON, Esq., A.L.S., 202 Victoria Terrace, Harrington Road, Workington.

N. B.—Rev. H. A. MACPHERSON, and W. HODGSON, Esq., will gladly answer any questions through the post that Members may wish to ask, with regard to any difficulty they may meet with in their reading on Zoological and Botanical matters respectively.

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 W. C. GULLY, Esq., Q.C., M.P., Farrer's Buildings, The Temple, London, E.C.
 J. G. GOODCHILD, Esq., F.G.S., Museum of Science and Art, Edinburgh.
 T. V. HOLMES, Esq., F.G.S., 28 Crooms Hill, Greenwich.
 R. H. HAMILTON, Esq., Senhouse Street, Maryport.
 F. M. T. JONES, Esq., J.P., C.B., Lesketh How, Ambleside.
 G. LOWTHIAN, Esq., 58 Blenheim Crescent, Notting Hill, London, W.
 Rev. H. A. MACPIERSON, M.A., 20 Cecil Street, Carlisle.
 T. A. MERCER, Esq., Free Library, Barrow-in-Furness.
 R. D. MARSHALL, Esq., Keswick.
 Rev. F. H. J. MC CORMICK, F.S.A. (Scot.), Derby.
 MILES MACINNES, Esq., M.P., Rickerby, Carlisle.
 T. BARLOW MASSICKS, Esq., Millom, Carnforth.
 Rev. H. H. MOORE, St. John's Vicarage, Darwen, Lancashire.
 G. H. PARKE, Esq., College Grove Road, Wakefield, Yorks.
 J. ROBINSON, Esq., C.E., East Barry, Cardiff.
 R. ALLEYNE ROBINSON, Esq., J.P., South Lodge, Cocker-mouth.
 Rev. Dr. TROUTBECK, Dean's Yard, Westminster.
 Dr. M. W. TAYLOR, F.S.A., 202 Earl's Court Road, London.
 Dr. TIFFIN, The Limes, Wigton.
 Major VARTY, Stagstones, Penrith.
 T. WILSON, Esq., Aynam Lodge, Kendal.
 R. J. WHITWELL, Esq., Airethwaite, Kendal.
 Rev. H. WHITEHEAD, Newton Reigny, Penrith.

Reports from the Associated Societies.

KESWICK LITERARY AND SCIENTIFIC SOCIETY.

21st SESSION, 1889-90.

<i>President</i>	...	...	...	...	Rev. H. D. RAWNSLEY, M.A.
<i>Vice-President</i>	...	...	...	...	J. POSTLETHWAITE, F.G.S.
<i>Hon. Secretary</i>	...	...	...	...	J. BROATCH
<i>Hon. Treasurer</i>	...	...	...	...	T. HIGHTON

Committee.

Rev. W. COLVILLE	|	J. FISHER CROSTHWAITE, F.S.A.
A. A. H. KNIGHT, M.D.	|	W. WILSON
L. COLLIER	|	ISAAC HODGSON

Delegates to the Council of the C. and W. Association.

Rev. J. N. HOARE, M.A., F. Hist. S.		W. WOODING NELSON
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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.

1889.

- Oct. 28—PRESIDENT'S ADDRESS.
 Nov. 4—Mr. LEICESTER COLLIER—"Charles and Mary Lamb."
 Nov. 25—Mr. R. HELLON, Ph.D., F.I.C.—"The Chemistry of Photography,"
 with experiments.
 Dec. 9—Rev. C. W. STUBBS, M.A.—"Poetry and Life."

1890.

- Jan. 20—Rev. H. A. MACPHERSON, M.A.—“Our Feathered Friends.”
 Feb. 3—Mr. J. H. MIDGELEY—“The Locomotion of Animals,” illustrated
 by diagrams.
 Feb. 17—Mr. W. R. FITZPATRICK—“Frederick the Great.”
 Mar. 3—Rev. CANON BARDSLEY, M.A.—“The History of Christian
 Names.”
 Mar. 3—Rev. S. R. CROCKETT, M.A.—“Over Central Europe with a
 Knapsack.”

ANNUAL MEETING.

LECTURES.

1889.

- Nov. 18—Mr. J. R. ANDERSON, B.A.—“Our Norseman Forefathers ; their
 Feats and their Faith.”
 Dec. 2—Mr. IRVING MONTAGU—“Scuffles and Sketches, being Wanderings
 of a War Artist at the Front,” with lime-light illustrations.
 Dec. 16—Professor BALDWIN BROWN, M.A.—“The Architecture of our
 great Cathedrals,” with lime-light illustrations.

1890.

- A course of Six Special Fortnightly Lectures on “The Age of Elizabeth,”
 by the Rev. W. HUDSON SHAW, M.A., Oxford University
 Extension Lecturer.

COMMITTEE'S REPORT.—Your Committee have much pleasure in reporting the progress of the Society, which now consists of one hundred and fifty-two members, as against one hundred and thirty last Session. The programme consisted of eight ordinary meetings and three lectures, in addition to which there was a course of six University Lectures delivered under the Oxford University Extension Scheme, by the Rev. W. HUDSON SHAW, M.A., his subject being the “Age of Elizabeth.” The ordinary papers and lectures may be classified as follows:—Literary, one; scientific, one; biographical, two; natural history, two; architecture, one; miscellaneous, four. The attendance at the lectures and meetings has been above the average, and the Committee feel that the work done by the Society is generally appreciated in the town.

At the suggestion of the President a lantern has been purchased by the Society, the cost being borne in great measure by a small subscription. The lantern has proved a most valuable acquisition to the Society, as a means of illustrating the lectures and thus

increasing their popularity. There was a deficit in the amount for the lantern of £6 5s., which has been provided out of the funds of the Society. The Committee wish to record their indebtedness to Mr. E. W. Cowan and to Mr. Still for their valuable suggestions and assistance in the purchase and management of the lantern; and to Mr. Collier for his help in the arrangement of the purchase.

Officers nominated for Session 1890-91. President: Dr. Gore Ring. Delegates: Rev. J. N. Hoare and Mr. J. Broatch. Secretary: Mr. J. Postlethwaite.

MARYPORT LITERARY AND SCIENTIFIC SOCIETY.

14TH SESSION, 1889-90.

President Rev. J. I. CUMMINS, O.S.B.
Vice-President H. BUMBY

Past-Presidents.

Rev. E. SAMPSON | P. DE E. COLLIN | A. HINE

Committee.

J. HEWETSON	|	R. H. HAMILTON
F. KELLY	|	J. B. BAILEY
E. W. LIGHTFOOT	|	C. EAGLESFIELD
Rev. T. HERD	|	J. HAMILTON
Rev. G. PATTERSON	|	Rev. S. O. RIDLEY
W. HINE	|	J. WILLIAMSON

Delegates.

H. BUMBY | R. H. HAMILTON

Hon. Treasurer J. S. ADAIR

Hon. Secretaries.

WILLIAM DILLION | MANICE A. REGAN

The following MEETINGS were held during the Session.

1889

- Oct. 22—CONVERSAZIONE. President's Address, "Simon Senhouse, Prior of Carlisle."
 Nov. 5—R. A. ALLISON, Esq., M.P.—"Edmund Burke."
 Nov. 19—Rev. C. H. PAREZ, M.A.—"Quintilian on Education."
 Dec. 3—IRVING MONTAGUE, Esq.—"Scuffles and Sketches, or Wanderings of a War Artist," illustrated with lime-light.
 Dec. 17 J. A. WHEATLEY, Esq.—"Gems and Precious Stones," with Specimens, and Replicas of famous Gems.

1890.

- Jan. 14—WILFRID LAWSON, Esq.—"Notes of a Tour in the East."
 Jan. 28—CONVERSAZIONE and EXHIBITION.
 Feb. 11—W. H. GOLDING, Esq.—"Cloistered Cathedrals and Ancient Abbeys," with lime-light illustrations.
 Feb. 22—Rev. J. N. HOARE, M.A., F.H.S—"The Ancient Egyptians."
 Mar. 11—The Right Rev. Abbot SNOW—"Dreams."
 Mar. 25—J. B. BAILEY, Esq.—"The Identification of Roman Stations in Cumberland."
 Apr. 8—Rev. H. A. MACPHERSON, M.A., M.B.O.U.—"The Wild Birds of the Sunny South."
 Apr. 29—Annual Meeting, Election of Officers, &c.

LONGTOWN LITERARY AND SCIENTIFIC SOCIETY.

13TH SESSION, 1889-90.

President S. F. MC.LACHLAN, Esq., M.B.

Vice-Presidents.

R. A. ALLISON, Esq., M.P.	|	W. EASTON ROBERTSON, Esq.
Rev. P. CARRUTHERS	|	J. G. GOODCHILD, Esq., F.G.S.
Mr. JOHN WILSON		

Treasurer and Secretary Mr. WM. RODEN

Committee.

Mr. I. RIGG	|	Mr. A. TWEDDLE
Mr. A. P. WILKIE	|	Mr. J. ROBERTSON
Dr. H. LEIGH GILCHRIST	|	Mr. J. G. TOPPIN

Delegates Messrs. WILSON AND WILKIE

The following MEETINGS were held during the Session :—

1889.

- Nov. 5—INAUGURAL TEA MEETING. Music and Readings.
 Nov. 12—A. MOUNSEY-HEYSHAM, Esq.—“Egypt,” with lime-light views.
 Nov. 19—Mr. A. P. WILKIE—“Now and Then.”
 Nov. 26—Mr. PEARS, V.S.—“The Breeding of Horses.”
 Dec. 3—Rev. A. C. WELSH, B.D.—“German Student Life.”
 Dec. 6—Mr. IRVING MONTAGUE—“Scuffles and Sketches,” with lime-light views.
 Dec. 10—Debate: “Is Phrenology True?” *Aff.* Mr. JOHN WILSON; *Neg.* Dr. Mc.LACHLAN.
 Dec. 17—Mr. DAWSON—“Birds of our Marshes.”

1890.

- Jan. 7—Music and Readings.
 Jan. 14—Dr. S. F. Mc.LACHLAN, M.B.—“Narcotics.”
 Jan. 21—Debate: “Cremation *v.* Burial.” *Opens*: Mr. W. RODEN and Dr. GILCHRIST.
 Jan. 28—Mr. J. SINCLAIR—“Our Dales Folk and Wit of Cumberland.”
 Feb. 4—Rev. H. A. MACPHERSON—“Bird Life on the Rhine.”
 Feb. 11—Dr. LEDIARD—“Climate and Disease.”
 Feb. 18—Dr. HADDON—“Facts of Irish History.”
 Feb. 25—Dr. LEIGH GILCHRIST—“Men and Manners.”
 Mar. 4—Dr. Mc.LAREN—“Alpine Climbing.”
 Mar. 11—Mr. WM. RODEN—“In the Wonderland of Chemistry,” with numerous illustrations and experiments.
 Mar. 18—Rev. P. CARRUTHERS—“Sir Walter Scott.”
 Mar. 25—Business of the Society, Election of Officers, &c.

CARLISLE SCIENTIFIC SOCIETY AND FIELD NATURALIST CLUB.

13TH SESSION, 1889-90.

President J. A. WHEATLEY, Esq.

Past Presidents.

The Right Rev. THE LORD BISHOP OF CARLISLE.

ROBERT FERGUSON, Esq.

MILES MACINNES, Esq., M.P.

The Worshipful Chancellor FERGUSON, M.A., F.S.A.

Rev. CLAUD H. PAREZ, M.A.

R. A. ALLISON, Esq., M.P.

Vice-Presidents.

S. J. BINNING, Esq.

| Dr. CARLYLE

Treasurer ROBERT CROWDER, Esq., Eden Mount
Hon. Secretary JOHN SINCLAIR, 6 Hawick Street

Committee.

Mr. R. J. BAILLIE
 Dr. BARNES
 Mr. E. F. BELL
 Mr. GEORGE DAWSON.
 Mr. T. DUCKWORTH
 Mr. F. HARRISON

Mr. R. M. HILL
 Dr. LEDIARD
 Dr. MACLAREN
 Rev. H. A. MACPHERSON
 Mr. J. N. ROBINSON
 Mr. T. T. SCOTT

Delegates.

J. A. WHEATLY, Esq.

| Rev. H. A. MACPHERSON

*The following MEETINGS have been held during the Session, and
 the undermentioned LECTURES given, viz:—*

1889.

- Nov. 4—Mr. J. A. WHEATLEY—"Sir John Hawkwood and the Free
 Lances of Italy, in the 14th Century."
 Nov. 18—Mr. THOS. S. PICTON—"Congoland, its people, constitution,
 wealth, and future development."
 Nov. 25—Mr. J. G. GOODCHILD, F.G.S.—"British Cliffs, Caves, and River
 Gorges."
 Dec. 5—Mr. IRVING MONTAGU—"Wanderings of a War Artist," with
 illustrations.
 Dec. 16—Rev. CANON RICHMOND—"Gainsborough and Romney."

1890.

- Jan. 13—Rev. H. WHITEHEAD—"Parish Registers."
 Feb. 10—HY. J. WEBB, Esq., Ph.D.B.Sc.—"Different Forms of Life."
 Feb. 24—Rev. H. A. MACPHERSON—"Birds."
 Mar. 10—Rev. C. H. GEM—"Tom Hood, the Poet of Wit and Humour."
 Mar. 24—Mr. E. F. BELL—"Folk Tales."
 Apr. 21—Mr. F. HARRISON—"Old Roads and Paths."

During the Season three Field Meetings have been held, and
 about ninety copies of the *Transactions* have been distributed gratis
 among the Members.

AMBLESIDE AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

13TH SESSION, 1889-90.

President F. M. T. JONES, Esq.

Vice-Presidents.

G. GATEY, Esq.

Rev. C. H. CHASE

Treasurer Mr. W. LISTER

Secretary Mr. J. BENTLEY

Delegates.

Mr. C. W. SMITH

Mr. J. BENTLEY

Committee.

Mr. T. BELL
Mr. H. BELL
Mr. J. BROWN
Mr. W. DIXON
Mr. J. FLEMING

Mr. E. HIRD
Rev. C. W. RAWSON
H. REDMAYNE, Esq.
Mr. STALKER, Senr.
Mr. C. W. SMITH

The following MEETINGS were held during the Session :—

1889.

Oct. 15—Rev. J. SHARPE OSTLE, M.A.—“Notes on the Cumberland Dialect.”

Oct. 29—Rev. H. WHITEHEAD, M.A.—“Parish Registers.”

Nov. 12—J. A. WHEATLEY, Esq.—“Diamonds and Precious Stones.”

Nov. 26—J. G. GOODCHILD, Esq.—“Dogs and their Ancestry.”

Dec. 10—IRVING MONTAGU, Esq.—“Wanderings of a War Artist at the Front,” illustrated by lime light,

1890.

Jan. 21—J. F. CURWEN, Esq.—“Warming and Ventilation.”

Feb. 4—R. J. WHITWELL, Esq.—“Dictionaries—Dictionary Makers and Dictionary Making.”

Feb. 18—Rev. H. D. RAWNSLEY, M.A.—“Some more Royal Mummies.”

Mar. 4—B. A. IRVING, Esq.—“Herculaneum and Pompeii.”

Mar. 18—Rev. W. TUCKWELL, M.A.—“The Lake Flora.”

SILLOTH AND HOLME CULTRAM LITERARY
AND SCIENTIFIC SOCIETY.

11TH SESSION, 1889-90.

President Rev. H. M. TODD, M.A.

Vice-Presidents.

JOSEPH GLAISTER

J. M. PAULL, F.G.S.

Committee.

J. BLENKINSOP
G. T. CARR
W. CRABB
JOHN GRAHAM

Rev. S. HEBERT, M.A.
W. M. HUDSON
Rev. W. P. INGLEDOW
THOMAS JOHNSTON

Rev. W. A WRIGLEY

Hon. Treasurer JOHN STRONACH

Hon. Secretary H. L. BARKER

The following MEETINGS were held during the Session :—

1889.

Oct. 16—Mr. R. J. BAILLIE, F.R.A.S.—“Lord Tennyson as a Poet.”

Nov. 13—Rev. H. WHITEHEAD, M.A.—“Parish Registers,”—*continued.*

Dec. 11—Mr. IRVING MONTAGU—“Scuffles and Sketches, or the Wanderings
of a War Artist.”

1890.

Jan. 15—Rev. J. N. HOARE, M.A., F.R.H.S.—“The Ancient Egyptians.”

Feb. 19—Rev. C. H. GEM, M.A.—“Art and Faith.”

Mar. 19—Rev. CLAUD H. PAREZ, M.A.—“Eyes.”

Apr. 9—ANNUAL MEETING.

BRAMPTON LITERARY AND FIELD NATURALIST
SOCIETY.

SESSION 1889-90.

President G. J. JOHNSON, Esq.

Vice-Presidents.

Rev. S. FALLE | Rev. H. J. BULKELEY

Delegates.

Rev. S. FALLE | Rev. J. ROBINSON

Treasurer J. B. LEE, Esq.

Secretary Mr. ISAAC B. HODGSON

Committee.

Mr. J. FARRER
Mr. HUGILL
Mr. JACKSON
Mr. JAMES
Miss MACQUEEN

Mr. RIGG
Rev. J. ROBINSON
Mr. J. STEEL
Mrs. H. Y. THOMPSON
Dr. THOMPSON

The following MEETINGS were held during the Session:—

1889.

Sept. 3, 5, 10—Rev. A. JOHNSON—"The French Revolution."

Oct. 15—Rev. J. BRUNSKILL—"Church Ales." Annual General Meeting.

Oct. 29—Reading of Goldsmith's *Good-Natured Man*.

Nov. 12—Rev. R. BOWER—"Norway."

Nov. 26—Rev. J. N. HOARE—"Cuneiform Inscriptions of Assyria,"
illustrated by diagrams.

Dec. 4—Mr. IRVING MONTAGU—"Wanderings of a War Artist," with
lantern illustrations.

Dec. 10—Mr. POSTGATE—"The Life History of a Butterfly."

1890.

Jan. 14—Mr. J. SINCLAIR—"Our Dales Folk and Wit of Cumberland."

Jan. 17—Rev. C. F. GUNTON and Dr. THOMPSON—"A Trip to Paris, with
description of Paris, Exhibition, and Eiffel Tower," with
lantern illustrations.

Jan. 28—Rev. CANON THORNLEY—"Evolution."

Feb. 18—Rev. H. J. BULKELEY—"Eminent Persons who died in 1889."

Mar. 11—Rev. W. GIBSON—"Thomas Carlyle."

Mar. 25—Rev. H. WHITEHEAD—"A Walk round Brampton."

PENRITH AND DISTRICT LITERARY AND
SCIENTIFIC SOCIETY.

9TH SESSION, 1889-90.

President Rev. H. WHITEHEAD, M.A.

Vice-Presidents.

GEORGE WATSON | W. B. ARNISON

Treasurer J. B. SHAWYER

Secretary H. MCLEAN WILSON

Committee.

Rev. W. B. SCHNIBBEN	|	C. H. GRAHAM
Rev. T. P. MONNINGTON	|	F. KING
J. THOMPSON	|	E. H. KEED
T. LESTER	|	JAMES YATES
Rev. W. MARSH	|	W. BELL

Delegates.

GEORGE WATSON | W. B. ARNISON

The following LECTURES were given during the Session :—

1889.

An Oxford Course of Six Lectures on the French Revolution, by C.
MALLET, Esq.

Dec. 19—Mrs. IRELAND—"Browning."

1890.

Jan. 16—CONVERSAZIONE.

Jan. 23—Rev. CANON MATTHEWS—"Physiognomy."

Feb. 6—J. F. CURWEN, Esq.—"Domestic Sanitation."

Feb. 20—Rev. J. FORDHAM—Chinese Buddhism."

Mar. 6—Rev. H. A. MACPHERSON.

Mar. 28—J. ALTHAM, Esq., M.B.—"Music and Medicine."

WINDERMERE LITERARY AND SCIENTIFIC SOCIETY.

8TH SESSION, 1889-90.

President Rev. A. RAWSON

Vice-Presidents.

CANON STOCK | Mr. B. A. IRVING

Secretaries.

COL. MACDOUGALL | Mr. FRANK BARTON

Treasurer Mr. JOHN HOLLAND

Delegates.

Mr. G. HEALEY | Mr. J. HOLLAND

Committee.

Mr. J. W. ATKINSON	Mr. W. LONG
Mr. S. ATKINSON	Mr. J. LONGTOWN
Mr. J. T. BOWNASS	Mr. F. MARR
Mr. J. BELL	Mr. G. MOIR
Mr. J. BONNY	Rev. J. M. MOSS
Rev. F. BROWNSON	Mr. G. H. PATTINSON
Mr. R. CLEGG	Mr. A. H. RAIKES
Mr. H. COUTTS	Mr. T. THOMPSON
Mr. C. J. HALL	Mr. W. V. YATES
Mr. G. HEALEY	

The following MEETINGS were held during the Session :—

1889.

- Oct. 24—OPENING CONVERSAZIONE.
- Nov. 4—Rev. A. RAWSON—"Uses of an Atmosphere."
- Nov. 18—Mr. E. S. BRUCE—"Fifty Years of Scientific Progress."
Illustrated by Dioramic Views, Photographs, &c.
- Dec. 2—Rev. G. E. P. READE—"Popular Delusions of the Past."
- Dec. 9—Mr. IRVING MONTAGUE (Special War Artist for the *Illustrated London News*)—"Wanderings of a War Artist at the Front."
Illustrated by Lime Light.
- Dec. 27—Promenade Concert by Mr. Johnson's Band.

1890.

- Jan. 7—Mr. JOHN E. MARR—"Greenland's Icy Mountains."
- Jan. 16—Professor FRANK CLOWES—"Accidents from Gas and Petroleum."
Illustrated by Experiments and Lime Light Photos.
- Feb. 10—Mr. W. H. GOLDING—"Engineering Triumphs of our Age."
Illustrated by the Oxy-Hydrogen Light.
- Feb. 25—Dr. MASON—"Westmorland Characteristics and Descent,"

Report of Association Secretary.

Your Council has great pleasure in submitting its Sixteenth Annual Report.

Compared with last year the results are as follows :—

	<i>Members.</i>		<i>Transactions taken.</i>	
	<i>1889</i>	<i>1890</i>	Part XIII.	Part XIV.
KESWICK	130	152	50	50
MARYPORT	90	130	60	50
LONGTOWN	27	41	—	6
CARLISLE	120	130	100	109
AMBLESIDE	85	71	10	20
SILLOTH	40	44	6	—
BRAMPTON	90	99	8	4
PENRITH	202	180	140	120
WINDERMERE	104	120	6	20
ASSOCIATION MEMBERS ...	38	40	38	40
	<hr/>	<hr/>	<hr/>	<hr/>
	926	1007	418	419
	<hr/>	<hr/>	<hr/>	<hr/>

MEMBERSHIP.

The best thanks of the Council are due to the various Local Committees, and especially to the Local Secretaries, for the very satisfactory increase in the number of Members, testifying as it

does to much earnest work on their part. The Council trusts the increase will be maintained.

With regard to the Association Members, there is, again, a small increase, and the Council can only express a hope, over and over again expressed, that this list will extend with greater rapidity than it has hitherto done. If this could be accomplished, much more important results might be obtained.

THE TRANSACTIONS

Have been enlarged from 114 pages in Part XIII. to 194 pages in Part XIV. Many new features have been introduced, and these might be almost indefinitely extended were the demand greater. The Council would be glad if the Local Societies could hit upon some plan by which this desirable end could be obtained. If each Local Society would briefly state on its Annual Programme, that the *Transactions* are published annually, at a cost to Members of 1/- each, also that all the Back Numbers are still in Stock, this might greatly decrease an ever increasing Surplus Stock, and thus tend much to the prosperity of the Association.

As it is, each Local Society, by Rule 8, is "entitled to recommend one original and local paper communicated to such Society for publication in the *Transactions* of the Association, but Societies contributing a capitation grant on a number of Members exceeding 150 Members shall have the privilege of sending two papers."

In addition to this (Resolution, Council Meeting, May, 25th, 1886) "When any affiliated Society would like papers printed other than those in accordance with Rule 8, abstracts of the same can be inserted, subject in each case to the decision of the Council." Thus, even though a Society has not any paper for publication *in extenso*, still a summary or abstract of other papers may be published.

The Editor will gladly summarise such papers, and submit the same to the author before publication.

SUB-COMMITTEES.

In another direction the work of the Association has grown, and it is one to which great importance is to be attached, as it is an attempt to work on the lines laid down by the British Association, with which our Association is affiliated. (See Part viii).

For this purpose your Council recommended the election of permanent Sub-Committees, each of which should engage in some definite work.

The following Sub-Committees have already been appointed, viz. :—

At KESWICK, in Meteorology and Geology.

At MARYPORT, in Archæology, Marine Zoology, Botany, and Geology.

At CARLISLE, in Botany, Entomology, Geology, Ichthyology, and Ornithology.

When these Sub-Committees get fairly to work, the Council anticipates that much good will result therefrom, and it trusts next Annual Meeting not only to notify a still larger number of such Committees, but also the general result of their deliberations.

UNIVERSITY EXTENSION.

In the matter of University Extension the Council has also made a forward movement, *two* Local Associations having elected their Extension Lecturer through the offices of the Hon. Association Secretary. During the coming year the action of Reading Circles as an adjunct to University Extension, or as a separate organisation, will be anxiously watched.

LOCAL COMMITTEES.

The Council would suggest that the various Local Committees, Delegates, &c., be elected at the end of the Session, rather than at the beginning, as is the case in one or two Societies. The benefits of such are obvious.

Local Associations would do infinite benefit to the Council if they would, from time to time, send up Resolutions bearing on the work of the Association. Too much is left to the Council, which cannot thoroughly understand the exact wants of the Local Societies.

The Council would like to see each Local Society take a more real and active interest in the welfare of the Association, in short to look upon itself as an integral part of this larger Association, which, in its turn, is an integral part—in fact one of the largest branches in connection with the British Association. At the head (in 1888) stood the Yorkshire Naturalists' Union, with 2,484 members; then in succession we have the Midland Union of Natural History Society, with 2,000 members; Royal Scottish Geological Society, with 1,162; East of Scotland Union of Naturalists' Society, 1,053; Cumberland and Westmorland Association, 910 (in 1889 the number was 1,007).

For the guidance of Local Committees, the Council would suggest the following as suitable subjects for consideration during the Coming Session, viz. :—

1. How can the issue of the *Transactions* be improved and extended?
2. What can be done in the matter of University Extension, Reading Circles, &c.?
3. What is the best method of working a Local Association?
4. How can Local Associations be formed in other centres than as at present?

5. How can the Library be made of real and permanent benefit ?
6. How can the Association aid in Science Teaching ?
7. How can the work of the Sub-Committees be most efficiently done, and the results preserved ?
8. How can inter-communication between the Local Societies be best fostered ?

The Council ask for special reports on Nos. 6, 7, and 8.

In suggesting these topics the Council is fully aware that the arrangement of a Programme is the great point ; still a flourishing General Association may do much to facilitate the success of the Local Associations.

LECTURERS.

A list of gentlemen who might give Lectures at neighbouring centres has been prepared, and will be sent to each Society requiring it. By this means the Programme can be very easily completed. The Council would refer the Local Societies to Rule 14, viz., that "the travelling expenses of all who assist in carrying out the Programme . . . shall be defrayed by the Society assisted."

The following is the stock of Back Numbers of the *Transactions* on hand January 15th, 1891 :—

No.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.
	45	66	6	2	95	227	248	220	232	33	163	156	222	245

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

BALANCE SHEET FOR THE YEAR ENDING AUGUST 13, 1890

RECEIPTS.	EXPENDITURE.
Balance forward £22 11 6	Assoc. Lecturer, 8 Lectures £42 0 0
Subscriptions towards Assoc. Lecturer's Expenses ... 22 6 3	Postages—Editor 0 12 0
Capitation 803 Members... 21 19 0	„ Librarian 0 11 6
Subscriptions from 28 Associ- ation Members (Annual) 7 0 0	„ Hon. Sec. 1 18 6
<i>Transactions</i> , Part XIV.	Carriage— „ 0 7 5
To Local Societies (291) 14 11 0	Back No.— „ 0 1 4
„ Assoc. Members (30) 1 10 0	Part Expenses, Annual Meet- ing (1890) 1 0 3
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THE STUDY OF LICHENS, WITH ESPECIAL
REFERENCE TO THOSE OF THE LAKE DISTRICT.

BY J. A. MARTINDALE.

(Read at Ambleside.)

THE study of Lichens has never to any extent been popular in England. There have always been, indeed, since botanists became something more than mere herbalists, a few men who have devoted considerable time and attention to their examination and to the elucidation of species and genera; and among these, some—as Dawson Turner, Borrer, Taylor, Mudd, Leighton, and Crombie—have obtained a wide and well-deserved fame for their skill and knowledge. But though we have had leaders, followers have at all times been far too few in number, and, if I may venture to say so without offence, somewhat half-hearted in the pursuit. To speak from my own experience, during the twenty years that I have been engaged in the examination of Lichens, I have only twice had the pleasure of meeting and speaking with anyone that had taken up the study with heartiness. Of course, scattered up and down the country—alas! at too wide intervals—are several persons more or less enthusiastic in the matter; and with some of these I have enjoyed pleasurable and instructive correspondence. But the fact remains, that comparatively few English botanists, of late years at all events, ever give more than a cursory glance at Lichens. Other cryptogamous plants have aroused much more general attention. Fungus-hunters gather together in their forays in large numbers; in every botanical society there are several

bryologists and students of hepaticæ ; lovers of ferns abound everywhere : but the lichenologist is, for the most part, a solitary being, and seems to have become shy of making his predilection known.

The consequence of this general neglect of the study is seen in the meagre knowledge we have at present of the extent of our lichen-flora, and of the distribution of species through our islands. So far as flowering plants and ferns are concerned, I believe there is no country in which plant distribution has been so fully worked out as it has been in our own. But with Lichens the reverse is the case. A few districts have been well searched, as North Yorkshire by Mudd, Shropshire and some parts of Wales by Leighton, and some of the Scotch counties by Crombie ; but of by far the greater part of our island we seem to know next to nothing of the lichen-flora.

And if, through the dearth of observers, we are behind-hand in a satisfactory knowledge of the number of species which grow with us, and of their distribution, there is another portion of the study, and that a still more important one, in which we are much more backward. As regards the life-history of Lichens, their morphology and the relation they bear to other allied classes, there can hardly be said to be any native literature at all. Almost everything we have on these points has been drawn from foreign sources, and we do not seem to have a single observer who has made any extended researches calculated to illustrate the life and development of Lichens.

It is hard to find any valid reason for the almost total disregard of these questions by English botanists. It is true that there are difficulties to be encountered in the investigation. Lichens are of slow growth, and long-continued watching reveals few changes in them. The cells of which they are built up are in general so minute that it is hard to trace the course of their development, and the difficulty is increased by the circumstance that almost every attempt to cultivate them has signally failed. In these respects they are, perhaps, less promising objects of study than Algæ or Fungi, which offer more facilities for investigation, in

some instances from the greater size of their component cells and the distinctness of their contents, and, in others, from the rapidity of their development and the readiness with which they can be cultivated in a form rendering them easy of microscopical examination. Whatever may be the reason, an erroneous opinion has certainly been prevalent respecting them. Schleiden, in his "Principles of Scientific Botany," made the strange assertion, "Lichens offer little worthy of notice,"—a statement echoed, if I mistake not, by Dr. Lankester. The remark of the eminent Swiss lichenographer, Schärer, is sometimes quoted, that the texture of Lichens is too dense and compact to permit their satisfactory examination under the microscope; but a look at the context shows that he was speaking of the difficulty he should himself find, at his advanced age, in cutting sections sufficiently fine.

But if it is to be regretted that Lichens have attracted the attention of so few scientific observers, it is not a matter for much wonder that they have not greatly aroused the curiosity of the unscientific. They are in general too subdued in colour, there is too great a sameness and monotony in their circular outlines, or vagueness in the indefinite patches they form, as they spread over rock, tree, or earth, to draw upon themselves the notice of the people. Many of them indeed are so minute, that a large rock or an aged tree might be covered with them and yet they would be invisible to a person standing but a short distance away. In such cases the only thing that indicates their presence is a delicate suffusion of various shades, which has excited the admiration of poet and painter, but is not pronounced enough to waken interest in the uneducated mind. Looked at more closely, however, we find them, like all else in Nature, clothed with beauty. Let us assist our feeble sight with a magnifying glass, and there are few that do not show an elegance of contour, charming to the eye and wonderful to reflect upon.

"Handsome is as handsome does" is an old saying, and had our Lichens been found of some economic use, they might, in spite of their external insignificance, have come in for some share of attention. But as they lack striking features, so also they want

the attraction of utility. Formerly, in many parts of the country, several species were used as sources from which to obtain dyes, but the Lichens of sunnier countries possess these colorific qualities in greater degree, and for many years our native species have been left quite unused, and they are thus completely passed over as things of neither use nor beauty.

Such being the case, we need not be surprised that we have no English name for these plants, and that botanists have had to borrow from another tongue a designation for the class. There are certainly a few local names given to those species formerly used for the manufacture of dyes. In some parts of Scotland, for instance, such plants are known as *crottles*, in the Highlands as *kork* or *korkalett*, in Wales as *kenkerig*, and in Durham and Northumberland as *stony-rag*; but the more general name is *moss*. Thus those tiny grey cups, edged round with scarlet, are called *cup-mosses*, and we have also the *reindeer-moss* and the *Iceland-moss*. These latter names were indeed given to the species they denote by botanists, and do not spring from the folk. They fit in, however, very well with popular opinion, for almost universally, by persons unacquainted with modern botanical classification, such Lichens as are by any chance brought before their notice are considered to be species of moss. Both the notion and the names are relics of older views, and if we wish to discover what species of Lichens were known to the herbalists of the sixteenth and seventeenth centuries, we must search and shall find them under such names as *Muscus*, *Lithobryon*, or rock-moss; and *Dendrobryon*, that is, tree-moss.

Tournefort, a French botanist and a native of Provence, was the first who separated them from the various dissimilar plants among which they had previously been confounded, and gave them the name Lichen. This was at the close of the seventeenth century. The word was not a new coinage, but one which before his time had been used by mediæval writers to designate some kinds of liverwort. They in their turn had borrowed the word from Greek authors, who meant by it some plant that grew on wet rocks. What it was is uncertain, as the meagre terms in which it is

mentioned do not permit of its satisfactory determination. Very likely it was not what we call a Lichen, as our plants seem to have been known to the Greeks under the name *Splachnon*, *Phascon*, and sometimes *Bryon*, names which now, curiously enough, are applied to genera of true mosses.

In attempting to describe as briefly as possible the leading features in the appearance and structure of Lichens, it seems advisable to depart in some measure from the usual arrangement in botanical treatises, and to avoid, as much as possible, the use of technical language; and perhaps no better method can be adopted than to suppose ourselves engaged in collecting Lichens somewhere in the immediate neighbourhood of Ambleside, and to discuss such plants as we should be likely to meet with.

The best time for collecting Lichens is a bright day that has followed some rainy weather. It does not do very well to gather them when everything is saturated, for the substance of these plants swells with moisture, and when the weather is very wet they swell so much that their shape is considerably altered. But a change greater than that of shape takes place in such circumstances in their colour. In wet weather, their distinctive tints are for the most part lost, as the moisture renders their outer layers translucent, and permits the green colour of the internal cells to shine through and thus modify and obscure the usual colours of the plants. Neither is a very dry day the best that can be chosen, especially if it has been preceded by any long continuance of drought. Under such circumstances, Lichens become very brittle, and satisfactory specimens of some species cannot be obtained, as they break in pieces either while being removed, or in taking them home.

Speaking of the influence of the weather induces me to notice a peculiarity of Lichens which is sufficiently remarkable. It is that they lead a sort of intermittent life. In moist weather growth goes on continuously, but with the occurrence of dry days all progress ceases for a time. The plants dry up and become as it were dead, so that one may take many of them, and crumble them to pieces in one's hand. Their life and activity, however, are only arrested. On the recurrence of favourable weather, they awaken to new life

and proceed on their course of development as if they had received no check. Even the fragments of a plant we may have crushed to pieces are living, and, blown by the wind, may reach some sheltered corner, where they will set about slowly to build up new plants.

Westmorland weather, we all know, is humid, almost to a proverb, and it is not often that in this county we shall be deterred from collecting because of drought. All seasons are equally favourable to the lichen-gatherer, who may almost be said to have no winter. Of course, plants cannot be searched for with any prospect of success when everything is covered with snow, but *that* being absent, we shall obtain quite as satisfactory specimens in December or January as we can in June or July. In this the lichenologist has a great advantage over the student of flowering plants. *He* must seek each in its season, whereas Lichens seem to know no season, and they are as perfectly developed, and as fit for examination, in the midst of winter as they are at any other time of the year.

The appliances we must take with us are neither numerous nor very cumbersome, though, if our excursion be fortunate, we shall find the weight of our "plunder" rather heavy as we return. We shall need a hammer—such a one as geologists use is the best—for many of the plants we seek are so closely fixed to the rocks and stones over which they spread that to detach them is impossible, and we shall have to take a chip off the stone in order to secure our specimen. For the same reason, we must also have with us a stout sharp knife to remove pieces of bark when we wish to collect plants growing upon trees. The other requisites are a lens of moderate magnifying power, some paper—old newspapers serve the purpose—to wrap our specimens in as they are procured (so that they may not be injured by rubbing against each other on our journey home), and a bag or collecting case in which to carry them.

Living as we do in the country, surrounded on all sides by rocky mountains and moors, we shall not have to go many steps before we meet with examples of the plants we are about to study: neither for a first essay is it of much importance which way we turn. Around Ambleside are many places where a rich harvest of Lichens

may be gathered, and whether we remain on the low ground, ascend the slopes of Wansfell or of Loughrigg, or stray further to Nab Scar or Red Screes, we may be sure of obtaining specimens sufficient for several days' leisurely examination.

Red Screes is one of my favourite mountains, as on it I have gathered five or six species not previously described, besides others that are considered rare. There is nothing very wonderful in this, for, as I have said before, England has not yet been thoroughly searched. When it is, there is no doubt that these plants at present known only from Red Screes will be found to grow elsewhere. Indeed, with respect to one of them that is already the case, for I have met with it also on Coniston Old Man, on the northern face of High Street overlooking Mardale, and on the mountains above Mallerstang in the extreme east of the county.

For a first excursion, let us get on to the hills. We need not climb to the top; any place will do where we may have a chance of examining exposures of rock and of searching patches of moory ground. We can examine the walls and trees as we go along, and should also endeavour to spend a little time beside a beck, on the stones in whose bed we shall find species that love moisture.

There may be in our party some young botanist who cannot tell how to distinguish a Lichen from a moss, and it may not be amiss, therefore, to point out one of the more obvious differences. Mosses may readily be known from Lichens by the possession of distinct stems and leaves, much more minute of course than, but similar in appearance to, those of flowering plants. Most of their near allies, the Liverworts, may be distinguished by the same character, but among these latter are a few genera, as *Marchantia*, *Pellia*, *Lunularia*, *Riccia*, which approach Lichens in their form. In these cases, however, the beginner will soon discover essential differences when he examines them with the microscope, for their internal structure is much the same as in the higher plants, and not at all like that of Lichens.

Let us take it then as a general distinction between Lichens and all higher plants, that the latter possess leaves and stems which the former never have. Of course this character by no means

represents the entire difference between Lichens and the classes above them in the scale of vegetable organization, but it is one sufficiently obvious in the great majority of species, and it is the character which gives name to the group of plants to which Lichens belong. The distinction between Lichens and other lowly organisms of the same group—the so-called Algæ and Fungi of our botanical books—must be looked for in other morphological differences, and we had better defer its consideration.

Suppose us now upon our hunting-ground and ready to begin our search. All around us, overspreading the rocks, covering the walls from foundation to coping stone, and encrusting such portions of the ground as have been left bare of other vegetation, we see countless stains and patches; some small, hardly an inch across, others a foot wide or more; many of them nearly circular in outline, others of no definite shape, but extending themselves vaguely and diffusely. Very various in colour are these patches, grey and white being perhaps the most common, though shades of yellow, bronze, and olive abound, while not a few deepen nearly to black. All spread flat upon the surfaces they grow on, clinging so closely that the thinner and duller patches hardly seem distinct from the substratum itself. A greater contrast than they present to the rest of vegetation can hardly be conceived: earthy, arid, to all appearance dead, they seem the last things to which a name originally meaning "full of life," could be applied. Every one has seen them, comparatively few reflect on the mystery of their being, nor many note their exceeding variety in form, consistence, and colour.

These patches, earthy-looking, powdery, or filmy, are individual plants. For the species to which they belong they represent and perform all the functions of the roots, stems, and leaves of higher plants. Botanists have given the name of *thallus* to such vegetable structures as these, in which we can recognise no differentiation of parts, no member of separate origin, no organ with definite function. And however greatly we might at first sight be inclined to ascribe leaves or stems to some Lichens, in these we can make no such mistake. Their upper surface from centre to circumference is of

uniform character, presenting nothing like a stem ; nor when we remove a portion of a plant from its base of support do we discover the slightest trace of a root. All parts of the thallus are perfectly alike, and, so far as regards the absorption and assimilation of food materials, whatever function one part of it can perform is equally shared in by the rest.

In the great diversity of Lichen thalli of this kind, it is quite impossible, in a general survey, to notice and describe all their variations. We have supposed ourselves to be upon a botanical excursion, but reality is too strong for me, and language fails to convey correctly the many differences our eyes, armed with a magnifying glass, would readily detect were we actually among the plants in their place of growth. Let us notice a few species where the differences are more pronounced.

The thallus of one, *Lecidea lucida*, which we meet with very commonly, may be taken as the type of several others. You have doubtless noticed it frequently, spreading irregularly over the shady parts of stones in walls. To the naked eye it looks like a thin powder of a pale yellow colour, but examined under a lens it is seen to have in reality greater consistence. The magnifying glass also reveals what the eye fails to distinguish—minute round bodies scattered here and there over the surface. These are also yellow, but more shining than the thallus. They are the organs of reproduction, which I shall speak of presently. In other Lichens the substance of the thallus, instead of being powdery, is aggregated in little granular heaps, and the granulations vary greatly in size, not merely in different species, but also frequently in one and the same. Such a Lichen is *L. decolorans*, or *granulosa*, which we should certainly meet with abundantly in the course of our search, covering large spaces of peaty earth, with its gray granulations. This Lichen has borne various names, for, from the different appearances it assumes, forms of it have often been mistaken for distinct species. One name formerly given to it was *L. quadricolor*, from plants of it being sometimes parti-coloured, the thallus being gray, and the fruit varying from flesh colour when young through a livid green to a dull black in old age.

As the granulations increase in size they have a tendency to become flat, and so scale-like thalli are formed which have a very distinct aspect. Some botanists, indeed, have founded genera to contain these squamulose species, but the distinction is entirely artificial, and every gradation can be found between the granulose and the squamulose thallus. On the moors around us, also growing on earth, there is a species, *L. atrorufa*, with a thallus of this kind, good specimens of which are very handsome; and I remember well how much I admired it when for the first time, now many years ago, I gathered it near the foot of Ravensbarrow Crag. Better examples, however, of the squamulose thallus are afforded by species met with in limestone districts, and some of them are very common to the south of Kendal.

But the most frequent type of these crustaceous thalli is neither powdery, like *L. lucida*, granulose like *L. decolorans*, nor scaly like *L. atrorufa*. To the naked eye it seems smooth and continuous, though it is rarely really so, for through the lens we find the surface to be minutely cracked. The cracks penetrate more or less deeply into the substance of the thallus, and, when numerous, divide it out into tiny irregular spaces called *areolæ*. This type of thallus can, in most instances, be shown to have been formed by the confluence of separate scales or grains which, as they increased in size, crowded upon each other, and finally coalescing, left nothing but the narrow chinks to tell of their original separation.

A very common Lichen of this sort, and when well developed a cheerful-looking plant, is *L. geographica*, which has derived its trivial name from the map-like aggregations formed when several plants grow contiguously. Each plant is surrounded by a radiating black border, and when neighbouring individuals meet as they spread over the stone, the borders serve to separate each from the others, and the whole group looks like a map divided into counties or provinces. This resemblance is heightened by the round black fruit with which each plant is dotted over.

Species with continuous or areolated thalli are so numerous that it would be wearisome to mention a title of their names, and perhaps the most animated description of them would fail to give

pleasure. No words can adequately express their character, and to be enjoyed they must be actually and carefully examined.

In thus briefly sketching some of the forms of crustaceous Lichens, one very attractive feature has been almost entirely passed over. Lichens owe a great deal of their beauty and interest to the forms and colours of their organs of reproduction. These are of two kinds, but one of them is so minute in size as seldom to be noticed. The larger one, which botanists call an *apothecium*, is the organ in which the spores—bodies representing the seeds of flowering plants—are elaborated. The apothecia vary to a much greater extent than the thalli; though their external differences are few in comparison with their internal.

All the examples I have chosen as illustrative of the forms and variations of the crustaceous thallus have been taken from one genus. But exactly similar forms occur in other genera, the generic characters being found in the structure of the fruit.

Thus the difference which separates the two genera, *Lecidea* and *Lecanora*, is the kind of border which surrounds the apothecia; in *Lecanora* this border is composed of the thalline substance, in *Lecidea* it is formed of a different tissue.

Very interesting apothecia are those characteristic of the *Verrucaria*. Here each fruit is a little black or coloured cone having a minute pore at the summit through which, when mature, the spores are emitted. The stalked apothecia of the *Calicia* are extremely peculiar, looking like Lilliputian pins or nails, and their dusty heads are usually crowded with a brown mass made up of thousands of spores.

But perhaps the strangest and most striking of all lichen-fruits are those found in certain Graphids, or letter-lichens. We have several species of them in Westmorland, some growing on trees, others on stone. The name given to this tribe is derived from the shape of the apothecia, which instead of being round, as in most genera, are long and narrow, sometimes simple, but often forked at various angles. A branch of a tree on which these plants have located themselves appears as if written over with characters having a wonderful resemblance to Eastern writing—Hebrew, Arabic, or

Chinese. One might fancy on looking at a stone or tree so taken up, that one had come upon some fairy inscriptions, and that, could the writing be deciphered, they would give information respecting the politics or the amusements of the "canny folk."

But I must hasten on and draw your attention to plants with a different form of thallus. Mingled with the crustaceous species already noticed, are others much more vegetable in appearance. These also lie flat upon the surface, but are not so closely attached, and when moist most of them can with a little trouble be removed entire from the substance they clothe. On their under side we often observe tufts of fibres which might be supposed to perform the office of roots. This is not so, however, and it has been made out that their only duty is to hold the Lichen to its support. Most frequently thalli of this kind are foliaceous in appearance, but it would be a great mistake to consider them leaves. They make up the whole vegetative body, and to regard them as leaves would be equivalent to making an entire plant to consist of one leaf. The popular notion of a leaf is derived from the ordinary growths of our trees and flowering plants, and the name would be denied to the thorns of berberries and gorse, to the tendrils of vetches, and the bladders of the *Utriculariæ*, which, however different in appearance and use, botanists recognise as modifications of leaves. The common opinion, then, that the distinction between leaves and stems is to be found in their shape and colour, does not stand the test of scientific examination, and the only valid distinction is one of position. Stems or axes bear leaves—leaves and organs of foliar origin are borne upon axes. Tried, therefore, by this test, these thalli cannot be leaves, for they form the whole substance of the individual plant.

The number of Lichens with foliaceous thalli is not nearly so great as that of the crustaceous kinds; but even here they are too many for me to describe individually, and I must content myself with one or two instances.

The bright yellow *Physcia parietina*, though much smaller than many others, seems to deserve first notice from its cheerful aspect. Everyone must have noted it, clinging around farm buildings,

barns, and stables, which seem to have a special attraction for it, though it by no means exclusively confines its presence to such edifices, but may be found generally distributed in lowland districts. It is one of the Lichens, too, that seems to like a seaside residence, and maritime rocks are frequently brightened by its gay circles.

Other common species of similar shape, but differing in colour and in the internal structure of the apothecia, are members of the genus *Parmelia*. Everywhere we meet with the crispy-looking *P. saxatilis*, which does not restrict itself to stones, as it should do if it acted up to its name. Then there is the pale greenish-yellow *P. conspersa*, the lobes of whose thallus are so frequently sprinkled with black dots, which indicate in this species the second and complementary reproductive organ.

The brown circles of *P. fuliginosa*, a great part of whose upper surface is covered with a soft-looking growth resembling the pile of velvet, are also extremely abundant. I always regard this plant with a feeling akin to gratitude, as it was through it I first made the acquaintance of Dr. Nylander, the man most versed in lichen-lore of this or any other time, whose kind assistance and advice have been so freely given to me for almost twenty years.

The *Peltigeræ* are large, coarse-looking, somewhat leathery plants, creeping over moss and rock, and bearing their shield-like apothecia on marginal lobes, which they often erect like fingers. One of them, *Peltigera canina*, was at one time thought serviceable in cases of hydrophobia; and another, *Peltidea aphthosa*, a bright apple-green plant with brown warts, was held to be a specific in the infantile disorder called "the thrush." Needless to say they are neither used at the present day.

I shall only mention one more, *Lobaria pulmonacea*, which can be found in this neighbourhood on trees. Its thallus is lobed in a strikingly divergent manner, and the upper surface is marked by numerous depressions, the elevations between which give it a peculiar reticulated appearance. In those times when plants were believed to carry in their form and appearance a key to their medical properties, the "lung of the oak," as it was called, was supposed of great efficacy in diseases of the chest. The tribe to

which it belongs is that in which Lichens attain their maximum development, and in tropical countries there are numerous species of great luxuriance and beauty.

These are but a few of the foliaceous Lichens we meet with in this neighbourhood, but time will not permit me to mention more, as there are other forms to notice, and the internal structure yet to be considered, and I must hasten forward as quickly as I can.

The third modification of the thallus is that of those Lichens which assume the form of miniature leafless shrubs. Some species, indeed, carry this mimicry of higher plants a step further, and add to their stems and branches simulacra of leaves. I need hardly say again that these are only instances of the playful humour of Dame Nature, and that in these particular plants we still have only one organ, the thallus, which performs, as in all other Lichens, the functions distributed in flowering plants between root and stem and leaf.

Of these shrubby Lichens a very good instance is to be found in a species widely spread throughout the British Islands on moorish ground, where among the ling, heath, and short grasses, its gray bushy growths fill up the gaps left by other vegetation. In more northern countries, as in Scandinavia, and in mountainous districts like Switzerland, its development is much finer than with us. In Norway, during winter, it is often fed upon by reindeer, which seek it under the snow, and on this account Linnæus called it *Lichen rangiferinus*, which has been Englished into "reindeer moss."

In reality there are two species so closely alike as to be with difficulty separated without recourse to chemical tests, and that to which Dr. Nylander has restricted the name, does not seem to be at all common in England. Our form, sub-species, species, or what you will, is the *Cladina sylvatica* of Nylander, but it may well keep the popular name of reindeer moss, especially as it is not probable the reindeer themselves would know the difference.

The reindeer lichen belongs to a tribe the members of which are almost protean in their diversity, and which has always been the crux of lichenographers. Forms of them may be met with almost everywhere, growing on earth and dead wood. Among the most

charming of them is the pretty cup-moss, which is doubtless well known by sight to every one.

Besides the *Cladonia*, species of two other genera of similar structure are to be met with commonly enough on rocks and walls in this neighbourhood. Some of them are coralline in appearance, and from this circumstance one species in each genus bears the name *coralloides*. Very beautiful they are when closely examined, but our Westmorland representatives lose much of their interest from being so frequently being barren.

Whoever has spent a short time in larch plantations must have been much struck by the grisly beards which depend thickly from stems and branches. None, however, of our British plants emulate the luxuriance they attain in continental forests. A few inches in length is the utmost they reach to here, while there they frequently exceed a yard. These beards are species of *Usnea*, to one of which the name *barbata*, or "the bearded," was given, and it is to this species that our British forms belong. I cannot do more than mention the names of other genera,—*Ramalina*, *Evernia*, *Alectoria* (one species of which looks almost like tangled pieces of hair from a horse's tail), and *Cetraria*. To this last genus belongs a somewhat leafy species, the so-called "Iceland moss" of the druggist, but which may be found on the summits of many of our Westmorland hills—not that it confines itself to elevated places, for I have gathered it on Cliburn Moss at a very moderate elevation indeed.

The three modifications thus hurriedly described—the Crustaceous, the Foliaceous, and the Shrubby—include all the forms that the thallus of Lichens assumes as regards external shape and division. From the most powdery to the most shrub-like there is an unbroken connexion of intermediates that shows the absolute identity of the organ so modified. All the plants I have referred to belong to the main section or family of Lichens. There remain some aberrant plants differing not so much in shape as in colour and consistence. We meet with examples of these around Ambleside, but they are more plentiful and diversified upon limestone rocks and earth.

When wet many of these *Collema*ceæ, as they are called, seem

almost shapeless pieces of brown, dull green, or olive jelly, and when dry they shrink remarkably into thin films or flakes of a dull black. The two principal genera are *Collema* and *Leptogium*; the species of the latter being much the more shapely. But if externally they yield in graceful form to the species of the true Lichens, yet as microscopic objects they have compensating advantages. The gelatinous nature of their thallus permits their internal organization to be most distinctly seen, and their examination is productive of much pleasurable instruction.

It is probable that within a short distance around Ambleside there are about three hundred Lichens to be found growing. No catalogue of these plants for any part of Westmorland has yet been drawn up, and this number is merely a guess, though I think it will be found to be a close approximation to the truth. From this estimate it will be seen how few comparatively of the species I have been able to notice on this occasion. But the plants adduced are all in some way or other representative, and give a fairly accurate view of the external characters of the whole class.

It is the universal experience of beginners that they mistake at times different varieties or states of the same plant for entirely different species, and *vice versa*, that they confound, from their external similarity, totally distinct plants. In the beginning of the study, the most learned professors fell into the same errors, and examination of the herbaria left by Acharius and other distinguished botanists of the last and early part of the present century proves how mistaken they often were in their notions of species.

The only way to determine these plants correctly is to submit them to examination under the microscope. This is often a slow process, but is always an interesting one. The microscope reveals to us the inner structure of the minutest plants, and we are often astonished that Lichens, whose thallus or whose reproductive organs betray hardly the slightest outward dissimilarity, are yet quite different in their internal anatomy. But not only is the microscope necessary for the discrimination of species; it is also of the highest use in enabling us to unriddle their nature and kinship. Not that by its means we are quite able to do this, as

witness the strife which has gone on now for twenty years as to whether Lichens are a distinct class, or only slightly modified Fungi.

It will not be without use, nor I hope without interest, therefore, if I delay you a short time longer to consider these plants under the aspect revealed by the microscope.

When sufficiently thin sections of a Lichen thallus are placed on the stage of this instrument, and examined with an adequate power, we perceive that in every instance they are made up of cells of two kinds, one of which contains chlorophyll, or some modification of it, while the contents of the other are transparent. In this respect Lichens agree with all higher plants, a few species excepted, and with the Algæ, but they are completely different from the plants known as Fungi.

The function of chlorophyll, which gives the green appearance to vegetation, you are doubtless acquainted with. It is by its means that plants are enabled to assimilate the carbonic oxide of the air and so to obtain materials for building up their structure. Plants destitute of it are, like animals, unable to live on inorganic substances, and are compelled to make use of organic matter elaborated previously by some chlorophyll-producing plant. Thus Fungi live on vegetable and animal matter already organized, and it is to this necessity that their destructive—and also in many cases their useful—action in the general economy of the world depends. Though some of them do us very considerable damage, as in the case of “dry rot,” which destroys our timber, and in the various blights which make a prey of our crops, yet there are others whose activity is beneficial, either as in the case of the yeast plant by altering and preparing for us useful products, or in other instances by removing or changing putrid matter which might become a source of danger.

But to return to our Lichens. All of them possess cells containing chlorophyll or some modification of it, but the manner in which the green cells are arranged among the clear or non-chlorophyllous cells is not the same in all. In the larger number of Lichens the green cells occupy a definite position and appear

stratified, as it were, between different layers of the remaining tissue ; in the rest no such stratification exists, but the green cells are distributed throughout the whole thallus, or in a few instances seem to form the greater part of it.

In every case, whether stratified or unstratified, the coloured cells seem to lie loose and unattached among the other anatomical elements. This want of connexion at first gave rise to the opinion that they were asexual reproductive organs, analogous in some degree to the gemmæ and bulbils of higher plants, and accordingly the name *gonidia* was given to them. The supposed function of reproduction attributed to them seemed to early botanists to explain everything that was necessary respecting them, and for a long time no inquiry as to their mode of origin was entered upon.

At length a French botanist, Tulasne, conducted a very skilful series of researches into the nature of various organs of Lichens and Fungi. In the course of his enquiry he sowed some Lichen spores, and watched their development over a space of many months. He saw that the spore put out filamentous cells which branched again and again. At certain points on these cells he discovered that others of a different order arose, and he watched their development till gradually a tissue was formed which produced in its interior chlorophyllous cells like those of mature plants. Not having his work at hand while I write, I am uncertain whether the plants lived to produce perfect thalli, but I believe they did not. However, he had seen enough to convince himself that the green cells—the gonidia—were produced from the other primitive tissue by a process of differentiation.

Dr. Nylander, to whom I have already referred as the greatest living authority on Lichens, took up the question of the origin of these green cells with reference to their production in later stages of the life of the plant. His examination proved to him that they arose amongst the hyaline cells which lie just above the gonidial layer—I am referring to stratified thalli—or in that part of the plant where its vital activity is greatest, that at first they were in direct connexion with the tissue which produced them, and that it

was not till the generating cells were resorbed that the gonidia lay loose among the other tissue.

These researches by Tulasne and Nylander as to the origin of the gonidia were in neither case entered upon from any doubt as to the complete unity of the Lichen thallus, for at that time Lichens were taken by everyone without question to be what they seemed—simple autonomous plants, just as much as a daisy or an oak. It was not till rather more than twenty years ago that any doubt whatever was thrown on this belief, or that the teaching of Tulasne and Nylander was challenged.

To understand the reason which led to the assertion of a dual nature in Lichens, we must refer to certain differences among the gonidia themselves. Not only do they occupy, as we have seen, different positions in the thallus, but there are other differences of moment between the gonidia of one plant and those of another. These differences are in respect to the character of their cell wall, the colour of their contents, and their mode of division and aggregation. Dr. Nylander has carefully studied them with regard to all these points, and classified the different forms that occur, giving to each distinctive names. I do not purpose to trouble you with these distinctions, as it would occupy too long. It is only necessary to remember that gonidia do differ to some considerable extent in different species of Lichens.

Well, rather more than twenty years ago, Professor Schwendener, a German botanist, began to study the thallus of Lichens, and, in two out of three parts of the work in which he gave to the world the result of his investigations, he represented the gonidia as growing in natural and orderly course out of the other tissue, and described and figured the way in which he conceived them to arise from the other thalline cells.

About this time Schwendener's attention seems to have been drawn to the great resemblance some gonidia bore to organisms known as uni-cellular Algæ or Protophytes, which lead an apparently free and independent life on moist rocks, earth, and the bark of trees. He then suddenly and completely changed his views, and asserted that he had never had any reason to believe that the

gonidia grew out of the rest of the thallus, but that such connexion as he had seen and described between these various parts of a Lichen, might be better explained as a parasitism of a fungus upon an alga. His new view he embodied in a small work that he published in 1869. The theory at once aroused great attention among botanists, and it was discussed from various standpoints. From that day to this the dispute has gone on, and, though lichenologists still oppose the theory as contrary to many certain facts, it has latterly obtained a large number of adherents, chiefly owing to its acceptance by Sachs, whose text-book on Botany is so generally used and admired; and perhaps it may be true to say that the advocates of the hypothesis are at the present time in the majority.

But the theory now accepted is a modification of that originally proposed. As now explained, it is much more plausible than the crude view Schwendener enunciated at first. The assertion that the clear cells of a Lichen, or what he called the fungus, preyed upon and destroyed the green cells, was too contrary to every-day experience to be long persisted in. Some advocates of the theory present it now in another guise, and assert that each Lichen is made up of two plants differing in origin and nature, and belonging indeed to quite distinct classes, which lead together a mutually dependent life. The clear cells, they say, form the body of a fungus which is unable of itself to assimilate carbonic-oxide, and therefore lives on the waste products of the green cells or algæ, which in turn benefit so greatly from the shelter afforded by the fungus, that it is doubtful whether they could in some instances live without it.

To consider all the *pros* and *cons* of the argument, which already has given rise to a considerable literature of its own, is quite impossible now. I shall only say that I do not yet see my way to accept it even so far as to admit that there are two plants in each Lichen; while all the facts that I have been able to glean respecting the morphology of Fungi are quite inconsistent with what I know to be the case in Lichens. Even if it could be proved that the green cells are no part of the Lichen—that is, of the plant whose

reproductive organs are so well known—it seems to me that Lichens would still remain distinct and apart as a class by themselves. The only change would be that Lichens must be considered less perfect plants than they had previously been thought to be by lichenologists, and it might entail some alteration in the classification of certain genera. But, except in a few imperfect species, the mode in which the gonidia first make their appearance in the thallus is totally opposed to the view that they are extraneous bodies, and I hold, with Dr. Nylander, that it is more likely to be true that the so-called algæ are imperfect states of Lichens, than that a Lichen should consist of two distinct plants.

But interesting as is this subject, I must leave it, as it is necessary to say a few words on those organs which produce the young germs of new individuals, and so preserve the species from generation to generation.

Every individual plant, from the time of its maturity to its decay, not only spends its energies on obtaining food for its own nourishment, but makes preparation for the continuance of its species after its own death, and each is fitted with organs necessary for this distinct function. In flowering plants two organs have been long known whose co-operation is necessary for the production of perfect seed, but it is only recently that the corresponding parts have been discovered in those tribes which do not bear flowers. Even now there are many plants in which after the most careful search they have not been discovered, but, as time goes on, the number of these constantly diminishes, and doubtless it will ultimately be found, that those which prove to be quite destitute of them are nothing more than imperfect states of other perfect plants.

In Lichens the two organs of reproduction seem to be certainly identified, though the precise manner of their action still requires further investigation.

Of the two, one has been long known, being often the most conspicuous part of the plant it belongs to. This is the apothecium, whose varied external shape among crustaceous Lichens I have already briefly sketched.

The other has not long been identified. Owing to its extreme minuteness, and the depth to which it is sunk in the thallus, it for the most part escaped notice, while in the few cases in which it was obvious enough to attract attention, its nature was misapprehended. Tulasne was the first to find it in many plants, to suggest its importance, and to give it a name. The *spermogonium*, as this organ is called, is a tiny sac either sunk in the thallus to its very summit, or nearly so. Its boundary wall is formed of a very fine tissue of interlacing filaments, and on its inner face project a multitude of very minute elongated cells either simple or jointed. From the ends of each cell, or from each joint, a still more minute cell buds out, which, when mature, separates from its parent and falls into the internal cavity, where it mingles with the myriads of other similar cells produced in the same way.

These tiny cells, or *spermatia*, are so minute that it would take a thousand of the longest placed end to end to reach an inch, while it would need eight times as many of the smallest; and as to their breadth, many of them are only the fifty-thousandth part of an inch across.

But we must say a few words about the apothecium, in whose interior are produced the spores, which, when mature, are capable of reproducing new individuals. In order to examine it under the microscope, it is necessary to cut a very thin slice vertically. From such a slice the structure of the whole and the relation of its parts may be clearly made out.

The base and sides are made up of a tissue which, varying much in different species and genera, is evidently of the same origin and function in all. From the upper part of the basal tissue a large number of filaments grow out parallel to each other and fill the whole space within the border, their upper ends forming the disc of the apothecium as viewed from above. Lying between the filaments just mentioned are a number of larger cells, also springing out of the basal tissue, and in these, which are called *asci*, the spores are produced.

Although all apothecia are composed of the same simple elements, there are such numerous differences of detail, that in no

two species are they exactly alike, every separate part of their structure being subject to a large number of modifications, either of size, or colour, or else of arrangement.

The border in some genera encloses nearly the whole of the internal organs, covering them over at the top, and leaving only a tiny pore by which the spores may escape into the external world. In others it is reduced to the smallest dimensions, and is thrown back out of sight by the growth of the internal parts. In the same way the basal tissue varies, now being thick and dense, now loose and thin. The filaments, the asci, the spores, in fine, every part, is subject to almost innumerable variations.

But, of all the parts, none exceed the spores for variety of form and beauty of organization. Varying in size from the ten-thousandth to the eightieth part of an inch, in shape from a simple sphere to a long slender worm-like body, in colour from the utmost transparency to an almost inky black, and being, moreover, either simple or variously divided by internal partitions, they are objects of the most surprising beauty and delicacy.

The first beginnings of the apothecium have been observed in very few Lichens, and only in very few instances has the part played by the spermatia been observed, and it is quite uncertain whether the apothecia of different families and tribes all arise in the same way. Stahl is the only one who has published details of its early development, and that only for species of *Collema*. From his observations it would seem that the course of development is very like that which occurs in certain seaweeds, and quite different from what fungologists say takes place among the Fungi. I can confirm this so far, that after dissecting many apothecia in their very early stages I have never been able to see anything resembling the organs described for such plants as *Ascobolus*, *Peziza*, and others.

I must now bring my necessarily brief account of these plants to an end. I should like to speak more fully on several points than I have been able to do, especially on the internal structure of the apothecia and thallus, but limits imposed upon me by circumstances forbid. I can only add that I shall be extremely gratified if I have

given any one of my hearers a little pleasure, and if I shall have shown that even in the humble plants most of us pass by without a glance or without a thought, there is a variety and a beauty of structure worthy of the Divine hand that made all things.

How mysterious it is that in things so small, with so little external grace, there should yet be in their most secret parts—where, from the beginning of creation till these latter days, the eye of man has never pried—so much that is exquisite in design, so lavish a profusion of detail, and such fitness and perfection in the whole.

SIMON SENHOUSE, PRIOR OF CARLISLE.

BY REV. J. I. CUMMINS, O.S.B.

(Read at Maryport.)

THOSE who are acquainted with Carlisle Cathedral may recollect a large ancient tomb which stands very prominently in the north transept. It is an altar-tomb, covered with a plain, black marble slab. The inscription, which had long been defaced, was restored a few years ago by the present representative of his family, and now declares the tomb to be that of Simon Senhouse, Prior of Carlisle. There is always something pathetic about the last of an ancient line; and the last of the old Priors who for four hundred years ruled in unbroken succession the Cathedral Monastery of Carlisle has not a little of this pathetic interest gathering round his name. The fate of the monks of England was tragic enough to stir a chord of sympathy even after three centuries have passed away. But Prior Senhouse's name excites our interest for other reasons. He is not quite a stranger to us. The scene of his life is laid in "merrie Carlisle," the capital of our county. In person he was the scion of an old Cumbrian family long and honourably connected with Maryport. And he lived in the early part of that wonderful 16th century, which saw so many changes, and which is still so full of interest to us as the great debateable ground of English history.

The city of Carlisle, though built on the site of a Roman station, a British town, and a Saxon settlement, really owes its foundation

to William Rufus, and has the distinction of being about the only good deed of one of the worst kings that ever sat upon the English throne. Its important position as a border fortress and the capital of a newly-conquered district led to its rapid development. During the next reign a noble church was built here by the priest Ethelwald and dedicated in honour of the Blessed Virgin Mary. When finished the munificent founder offered it to the Augustinian canons, then recently introduced into England, built them a monastery, and became their first prior. Seeing the importance of the city, and that there was no bishop nearer than Durham and York, Henry I. erected it into a bishopric. This was in 1133; the Episcopal chair was fixed in the church of the Augustinians, and their prior, Ethelwald, became the first bishop. These details are necessary to explain the unique position which Carlisle held amongst the English bishoprics. It was the only cathedral of Austin canons in England. The older English cathedrals were divided into two classes, the Monastic and the Secular, according as they were served by the regular order of monks or by secular canons. The distinction disappeared in the changes under Henry VIII., though traces of it still survive in the very different constitution of the Chapters of the new and the old foundation. Previous to the 12th century the regular cathedrals, the minsters, were exclusively in the hands of the Black Monks or Benedictines. They had retained many of the bishoprics founded by the early apostles of England (who were members of their order) such as Winchester, Rochester, Durham, and the Primatial See of Canterbury. The rest of the cathedrals were served by secular canons. When Henry I., therefore, founded his new see at Carlisle and gave it to the canons of St. Augustine, it was an innovation but a natural one. They were a new order in England, and at that time very popular. King Henry had recently endowed convents for them in other towns. The monastery and church at Carlisle were already in existence, and when the new Cumbrian bishopric was fixed in the revived city, and the existing church was chosen as the cathedral, it was only right that the honours of the Chapter should be conferred on the community to whom the church

belonged. But the example was never imitated, and Carlisle remained to the end the solitary instance of a Cathedral Priory which was regular but not Benedictine. These monastic cathedrals had certain characteristics which marked them off from their fellows. Besides fulfilling the usual duties of Divine service in the church, their canons lived together in community, observing a special rule of life and governed by their own superior. The head of the Chapter was not styled Dean as in the secular cathedrals, but Prior, or Cathedral Prior, to distinguish him from other priors who were only collegiate. All the members of the community were canons. They had the right to elect their own prior, and originally the bishop also. In course of time the freedom of election in case of the bishop was much curtailed, but the choice of the prior remained free and was one of the most valued rights of the monastery. Carlisle convent had been liberally endowed by Bishop Ethelwald and King Henry; and in spite of many losses and the ravages of incessant war it acquired considerable property in the course of four centuries. Many livings were in its gift, such as Stanwix, Hayton, Thursby, Sebergham, Dalston, etc. The Austin canons, differing in this respect from other religious Orders, used to appoint their own members to these parishes; the work of the parent convent being thus diversified by parochial duties in the country where the village churches, dependent upon the cathedral, were often served by small communities of two or three canons.

The position of Carlisle on the English Border gives it great prominence in the annals of the period, a prominence which the priory shares with the castle. For instance, during the troubled reign of Stephen the city was occupied by the Scots. Thither King David fled after the battle of the Standard. There, too, in the cathedral he knighted Henry Fitz-Empress, in 1149; and it was in the castle that he himself, "the sair saint for the crown," died in 1153. So disturbed was the country at this time that the bishopric was vacant for nearly sixty years, its possessions were alienated, and for a time the canons were driven away from their convent. A century or so later the cathedral saw some stirring

scenes. More than one Parliament met here, the sessions being perhaps held in the convent as they were at Westminster in the chapter-house of the abbey. In 1305, standing before the High Altar, the bishop (Halton) solemnly excommunicated Robert Bruce for the murder of his rival, Earl Cummin, in the church at Dumfries. The next year King Edward was at Carlisle, and again in his presence the Papal Legate, Cardinal D'Espagna, "accursed in terrible wise Robert Bruce, the usurper of the crown of Scotland." In 1307 the aged King, dying but still dauntless, offered up in the cathedral the litter in which his failing limbs had been borne; and then—resolute old hero as he was—mounted his war horse at the Priory gates for his last march to Scotland. And here, a few days later, the dead body of England's greatest warrior and wisest king was borne sadly back on its way to his last resting place at Westminster. It was only when his feeble son renounced the wise policy of his father that Cumberland felt the full brunt of the calamities in which the successful rebellion of Bruce had involved both countries. The weary border warfare that ensued dragged on for centuries. As they looked out from their walls over ravaged fields and burning homesteads, the burghers of Carlisle learnt what was meant—in the 14th century at least—by "Home Rule for Scotland!" Rapine and bloodshed, siege and foray varied with their changing fortunes the monotony of life in the "merrie citie!" Bands of mosstroopers, headed by a Musgrave or a Douglas, rode through the valleys; and not unfrequently on some fine day, when "the sun shone fair on Carlisle wa'," a sheaf of them would hang dangling by the neck over the Scots gate! Sometimes even the sturdy monks of the priory had to lend a hand for the defence of the city. Their convent was close up against the west walls, and at least on one occasion, in 1315, the canons amply justified their name by successfully defending the cathedral against the Scots; though three years afterwards they could not save it from the ravages of fire. So the story of the Priory passes on, uneventful, save when marauding Scots appeared beneath its walls, or a Lord Warden gathered troops there for a foray over the Border; one Prior and Bishop passing away after

another, until we come, about the middle of the 15th century, to the days when it received into its ranks the humble hero of our story, the youthful Simon Senhouse.

I am afraid we can't claim Prior Senhouse as strictly a native of Maryport, for he was not born at Netherhall, or Alneburgh, as it was then called. We might like to imagine him climbing as a boy over the hill on which the town now stands, or playing about the old manor house down by the Ellen, the peel-tower of which still remains. But unfortunately for the accuracy of this pretty picture, the Senhouses did not come to Netherhall until some time after his death. Our hero sprang from the family whilst it was still in its old home at Seascale ; and there he was born somewhere about the middle of the 15th century. The genealogy tells us that he was the son of Thomas de Sevenhouse, or Senhouse, of Seascale Hall, in the parish of Gosforth, by his wife, a daughter of Sir Richard Huddleston, Knight-Banneret, of Millum Castle. It was his nephew, John Senhouse, who, in 1528, married Elizabeth, heiress of the Eaglesfields of Alneburgh, and thus brought Netherhall into the possession of his family. Nor must you expect very full details of his youth, or indeed of any part of his uneventful life. He would probably be sent as a boy to be brought up in the cloister-school of the cathedral city. The school is historical ; many traces of its existence meet us in the old records ; and it is the lineal predecessor of the present Grammar School. It was taught by the canons, one of whom enjoyed the title of "Scholarcha," or Rector Scholarum, the office being endowed with portions of the livings at Stanwix and Dalston. Here we can fancy young Senhouse attracted by the blameless lives of his masters and the beauty of the services of the Church, and these early impressions may have determined the course of his life. Perhaps he was of gentle, studious disposition, with little zest for the more active professions. His youth coincided with the Wars of the Roses, when England was rent asunder by civil strife, and none but the most combative could have found pleasure in public life. From the school he would pass to the novitiate, where he would be exercised in new duties, proved in patience, obedience and the

unselfishness needed for conventual life, until his vocation tested by a year's probation, he would then be admitted to profession and received into the ranks of the community. This would be under the priorship of Thomas Haithwaite. Likely enough he would then be sent to complete his studies at one of the Universities. The regular orders had the custom of sending their more promising youths to study there, the Austin canons having a famous house at Oxford, St. Frideswide's, afterwards the cathedral of that city. I have not found any record that Senhouse did actually study at Oxford, but the practice is certain; and we may well suppose that one who afterwards became prior of his house was in his younger years amongst its more promising members. Returning home, his days would pass by in the peaceful round of conventual duties, engaged in teaching and private study, in priestly work among the people, and above all, in the punctual performance of the daily service, the stately ritual of the cathedral church. So passed quietly by the uneventful life of our hero, until the day when on the death of Prior Gondebour, in 1507, the votes of his brethren called him to the highest position within their gift, and he was duly installed Cathedral Prior of Carlisle.

Carlisle Cathedral was not then the fragment, beautiful but mutilated, which we know it now. The church is only about half the size that it was in Prior Senhouse's time. The Norman nave was standing then as Ethelwald had built it four hundred years before—a miniature Durham, with its simple, massive piers, its plain rounded arches, and its barbaric dog-tooth decoration. Our old enemies the Scots destroyed this as well as many of the conventual buildings in the 17th century; and only two bays are now left to suggest to antiquarian eyes its former grandeur. But of the monastery which Senhouse governed considerable portions remain, nearly all of which are in some way connected with him. The later Priors of Carlisle were not idle rulers. They had all the Churchman's fondness for architecture; and their works show them to have been liberal patrons of all the arts. It has been remarked that "the half-century preceding the destruction of the monasteries witnessed a great revival of architectural activity."

Painting, sculpture, and the allied arts flourished as well; there were schools for music and singing, besides the free school in the cathedrals; and at this very time, in Senhouse's youth, the first printing press ever seen in England was being set up in the Abbey of Westminster. Now, tastes of this kind, great works nobly conceived and well achieved are not bad tokens of the discipline of a house; they are hardly compatible with great disorders; they are signs of good administration at least, of wealth worthily employed. Senhouse and his brethren deserve whatever credit may be inferred from the fact that during this time extensive buildings, with all that these imply, were going on in Carlisle. Not long before, for instance, that beautiful chancel which is still the glory of the city had been completed; and each prior in turn took pride in adding to its beauty. To Senhouse himself are attributed the curious paintings on the screens behind the stalls, representing scenes from the Legends of St. Augustine and St. Anthony. Prior Gondebour, under whom Senhouse passed much of his religious life, built the Fraternity or Refectory, which is still standing—a magnificent hall, eighty feet by thirty, in the late perpendicular style. He, too, may have begun the Tower of the Prior's Lodge, now the Deanery; but it was Senhouse who completed or added to it, and he certainly decorated it. The quaintly painted oak rafters of the principal room are his work, and bear his name and device. The gatehouse leading to the Cathedral close dates from nearly the same time, the inscription round its archway recording that it was built by Christopher Slee, his immediate successor. One other personal trait of Prior Senhouse has been recorded, suggestive of his religious feeling. He used as his device or motto, the well-known distich:—“*Vulnera quinque Dei sint medicina mei*”—an old Latin pentameter, which may be thus freely paraphrased:—

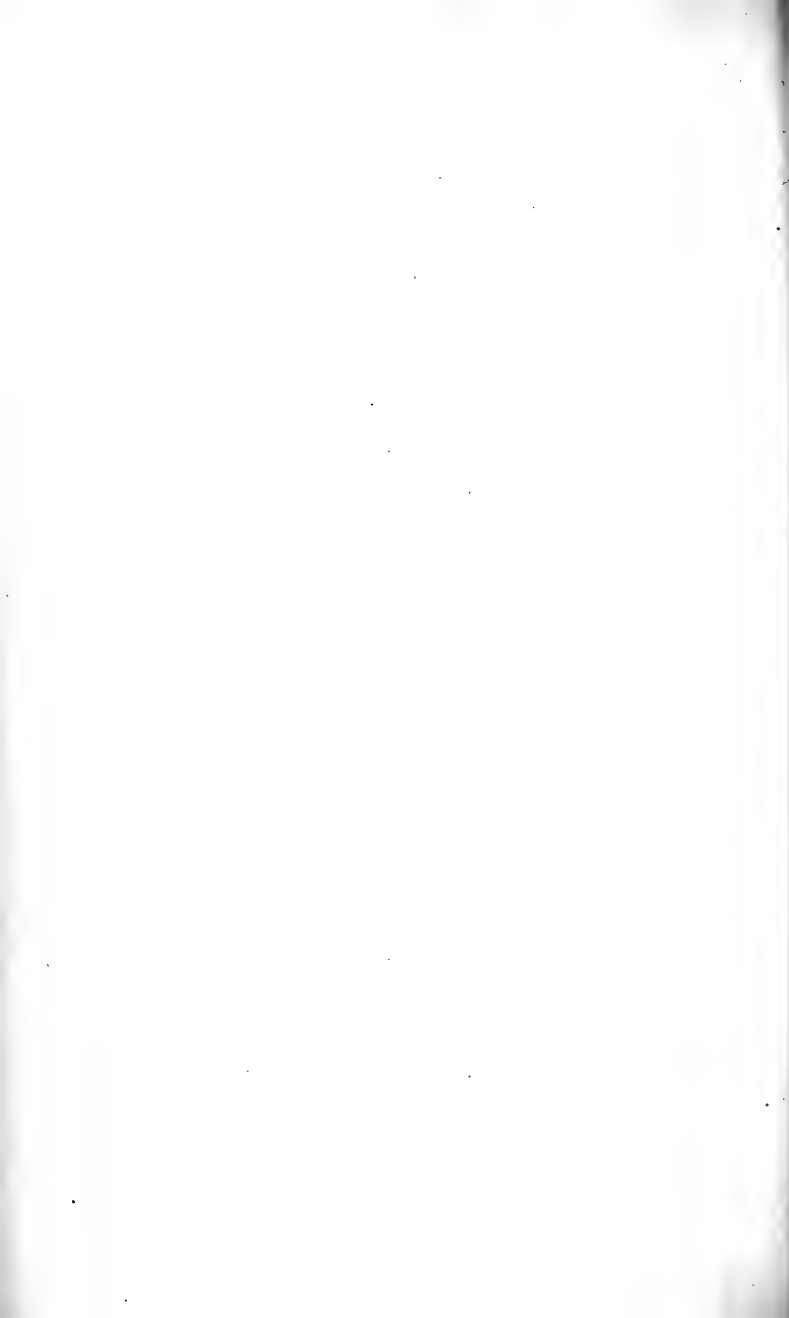
May the five wounds of my God
Be the healing of my soul.

Veneration for the Wounds of our Lord was widely spread in those days in the North of England—a soldier's devotion perhaps, well suited to men who lived near the Scots border. More than a century before the Banner of the Five Wounds had rallied to

unexpected victory our knights and bowmen at Neville's Cross; and a few years later when the Northern Counties rose in the Pilgrimage of Grace to protest against the suppression of the monasteries, the same banner waved over their ranks. It is an interesting coincidence that the last popular rising in defence of the monks should have been made under the sacred emblem which Senhouse used as his device.

Simon Senhouse died in 1520, the last of the Priors of Carlisle—the last at least who died Prior and was buried as such in his cathedral. Happily for himself he did not live to see the storm which was soon to break over his monastic home and to sweep away the order to which he belonged. I may but distantly allude to this subject. This is neither the time nor the place to discuss the suppression of the monasteries under Henry VIII. But I may be pardoned for saying that by the most competent modern authorities another judgment than the old one is now being passed upon the monks, and one much more favourable to them. For the first time the original records of those days of terror are being thrown open to the public. Men are beginning to realise that the old accusations against the monasteries rest upon nothing better than the word of enemies and plunderers; and as Edmund Burke has said of a similar subject, "It is not with much credulity that I listen to any when they speak ill of those whom they are going to plunder. I rather suspect that vices are feigned and exaggerated when profit is looked for in the punishment. An enemy is a bad witness; a robber is a worse." Few then will regret if they see at length lifted the cloud of calumny which has hung so long over these old monks; few but will be glad to learn that Senhouse and his brethren were not the idle, dissolute men that they have been represented; and that the life led by them in Carlisle Priory, as elsewhere, was an earnest, religious life—one spent in the worship of God and in faithful service of their neighbours. But whatever the varying verdict that may be passed upon it by the changing ages, the Order of which Prior Senhouse was a representative passed away. A few broken arches are all that is left of the cloisters which he often paced. But the halls which he built or

beautified still shelter the Dean who stands in his stead. The refectory in which he presided still speaks of the stately splendour of his old home. The church in which he worshipped still exists in most of its former beauty. And—most pathetic relic of all—there may still be seen in his cathedral the plain marble tomb, long voiceless, speaking now once more, beneath which all that is mortal of him rests! A curious custom grew up in later days in regard to this tomb, and was continued for centuries. It was used as the table whereon the tenants of the cathedral came each year to lay their tithes and rents. A strange usage!—and if it is not fanciful so to regard it, an act of unconscious homage from the tenants to the last representative of those old monks who had been their lords so long!



OLD ROADS AND PATHS.

BY F. HARRISON.

(Read at Carlisle.)

THE study of this subject has the advantage of being within the reach of all. They are objects that must be familiar to most of you. No one can take a walk abroad without getting on to some road or pathway. If you are making for the open country, possibly some lovely rural lane will invite you on and on by the attractions of its rural splendours. Some ancient highway may carry you over the country upon a longer and more important journey, or you may wander in the solitude of some lonely footpath. But any or all of these abound with interest, and will not fail to supply matter for reflection to the thoughtful mind.

When we consider the origin of some of our ancient roads and paths, we are carried at once to the earliest races of men that wandered over the hills and through the valleys of this fair land of ours—glorious old England. But if in our walk we should begin to note all the objects of interest that may be seen from almost any of our old roads and paths, we see opening out subjects for a course of lectures, rather than for a short paper of a few minutes' duration.

“All roads lead to Rome” was undoubtedly true when the Imperial sceptre of the Cæsar's ruled the whole known world; when Rome was the centre of civilization and the seat of government of the greater portion of the civilized world. And here in our district we have the impress of Rome, “Proud mistress of the world,” in many of the old roads and paths of this district even to-day.

I purpose to take you for a few minutes on to some of the old roads and paths of our own district. It matters little where we begin, we find the earliest origin, if not of our roads, of our ancient paths, some of which in remote districts have been trodden by human feet without interruption for thousands of years. There is a right of way over Crossfell top, which has never been questioned; and we have evidence that men have passed that way for two thousand years. Until the Roman occupation we had few, if any, roads in these islands. The wandering tribes of the earliest races were perfectly satisfied to find a track or path through the forest, which was all they needed in the way of communication. Watling Street, it is said, existed from the earliest times as a highway, but this is open to question, as it was probably only a well-beaten track.

Few, if any, examples of pre-Roman roads can be pointed out in this country, although "tracks" exist which have been used from the very earliest times, dating in fact from the pre-historical period.

But as soon as the Roman legions landed on our shores, road making began in earnest. They had chariots and wheeled carriages, and baggage to convey and take with them, and there being no roads, they of course had to make them, which they did. We can trace their movements over these islands to-day by the wonderful roads which they constructed, many of them serving the purposes to-day for which they were first constructed. Notwithstanding nearly two thousand years having passed away, they are still wonderful examples of engineering skill and human enterprise.

The Romans gave great attention and prodigious labour and expense to the making of military roads. They were too skilful generals to advance far into an unknown region without having a certain way of retreat if it should be required. It is recorded that the Emperor Severus lost fifty thousand men in the construction of the great North Road which enters Cumberland at Brougham Castle. The great highway was made regardless of the cost either of material, wealth, or human life, the natives being pressed into the work as well as his own well trained legions.

Possibly the oldest road in England is the Watling Street, which runs all the way from the wall in Northumberland, through Durham

and Yorkshire, right away to Dover. From the great road from York, over Stainmore, leading to Carlisle by way of Penrith, there is a branch from Brougham to Kirkbythore, which striking from Kirkbythore, almost due north, goes nearly over Crossfell top. Still continuing its northerly direction, and dropping down towards the Tyne valley near to Whitley Castle on the border of Northumberland, it continues its course on to the wall which it strikes at Carvoran, or Green Head, from which it still goes on right to Bewcastle and thence into Scotland. You can trace this road for miles over the great wastes over which it passes still—in dry seasons in particular. Owing to the soil having been disturbed, the herbage is quite of another kind, short and grassy as compared with the heather by which it is bounded. For miles on the east side of Crossfell you may follow through what is now one vast solitude, although no one can do so without thinking of the wonderful people who once ruled there, and made those ancient solitudes echo and re-echo to the prancing of the war horse; and that upon those craggy heights fluttered the banner of Imperial Rome. The market town of Alston, as many of you will know, is planted on a steep bank of the Tyne. The main street is remarkably steep; I do not know what the gradient may be, but few market towns have so steep a main thoroughfare. This Alston street has always been a severe strain upon horses with heavy loads.

Now there has very lately been laid down in this main street of Alston a paved causeway in the centre of the street, to relieve heavily-laden horses—an exact *fac simile* of the old Roman system for getting heavy weights up steep gradients, and this was the great principle laid down in the construction of the Maiden Way over Crossfell nearly two thousand years ago. These roads varied in width from four to fourteen yards, crossing the rivers and streams mostly by fords. The Romans did not build bridges, except where positively needed. I do not think any remains of a bridge have yet been found on this mountain range. The road generally consisted of a regular pavement, formed by boulders or rock laid in gravel, and joined together.

The Maiden Way over Crossfell, which I have already dwelt upon,

possibly might not have been made until a later period than the great road over Stainmore, which would, no doubt, be the most important, coming as it did right down the great plain of Cumberland upon Wragmire Moss—a splendid specimen of engineering skill, and which may still be seen. The road was carried over the mire upon a frame-work of solid oak, which sank with the weight of the material placed upon it. This has served its purpose for long ages, and is still serving it to-day.

It is a singular fact, that after the construction of the Maiden Way by the Romans, no further attempt at road making over the Crossfell range of mountains was attempted for about one thousand six hundred years. There was a track over Hartside for pack-horses and foot passengers, but nothing in the shape of a road until early in this century, when Macadam carried over his splendid road from Alston to Melmerby—undoubtedly the greatest undertaking over the Pennine range since the Maiden Way was constructed. Macadam has placed his stamp upon the country almost as strongly as the engineers of ancient Rome themselves.

The pack-horses seem to have passed in a regular gang from Penrith to Alston twice a week, by a road over Penrith Fell to the old bridge over the Eden, between the two Salkelds. Langwathby bridge was not built until 1682.

The old drove roads, most of which were mere tracks, abound with interest. The rights to drive to certain old established fairs are very curious, and the origin of them is entirely lost. This can only be accounted for on the ground that before the enclosure of these lands a right was exercised that even the Enclosure Acts did not interfere with.

These old drove roads are altogether very peculiar, but the decline of the great fairs, and railway communication, has caused many of them to be entirely lost. Nothing has interfered more with our old roads and paths than the railway system throughout the country. Some have been diverted, whilst many a lovely path has been entirely lost even in this immediate vicinity. For example, the beautiful path to the Spa Well, notwithstanding the efforts of the Footpaths Association, is in danger of being lost, the

Caledonian Railway Company having made no provision whatever for the public. Under the circumstances it has been robbed of its rural character, by the fact that you have to pick your way over a dozen lines of rails, and at the same time keep a sharp lookout for engines and stray railway waggons. Let us in imagination take a walk outside the city of Carlisle, on a pleasant evening in mediæval times. We pass through the gate at the Citadel, and get on to one of our old roads, old even then. One is now known as the Collier Lane, the oldest highway into the city of Carlisle that I know of. We pass on, leaving the Water Gate Lonning on our right, and so on over what is now Lancaster Street, past the Hospital for Lepers, which is still known as Old St. Nicholas, and near what is now known as Regent Street, to a point at Millholme Bank, formerly an inn, where even to-day you can find the old road, with little change from mediæval times, coming out at what is now the low end of the village of Upperby.

In other words, you have the old road which was there before the time of the Romans, from Millholme Bank to Upperby, and it has undergone little if any change. From about Regent Street to Millholme Bank it has been diverted and lost, other roads being substituted. But up the Collier Lane it is again original, over the same land, so far as I can make out. I venture to say, without much fear of contradiction, that the Collier Lane has been a road for two thousand years. Aye, when Botchergate was green fields, and the populous district in the rear of the station was only disturbed by the citizens taking their "dander" along the Water Gate Lonning.

To the north of the city you would pass out over the old bridges, past the end of the houses called Eden Terrace, coming out nearly opposite Stanwix Church. Upon the banks you can distinctly see the track of the old road to the north. This track, and that down the river at Etterby Wath, were the only roads leading north until comparatively modern times, when the new bridge was built, and the great road to Scotland opened out. I have no time to say anything about them; they would form an excellent subject for a

paper themselves, with all the halo of the old coaching days, and all the romance of the road from Carlisle to Gretna Green.

I will just mention the road leading to the west, and then I have done with the roads leading out of Carlisle. Passing out at the Irish Gate, the great highway ran along Caldcotes, and certain historical facts go to show this to be an old road. We know that King Edward I. passed along Caldcotes with his army in 1307, on his ill-fated expedition against Scotland; and that his body would be carried through Caldcotes again from Burgh-on-Sands there can be little doubt. From the fact that about this time the king's magazines for supplying the armies engaged against the Scots were situated at Skinburness, there would be a deal of traffic along Caldcotes, and not only that, but it would be the road from Carlisle to the great Abbey of Holme Cultram, which would be in its palmy days about this period (1307), and for a long time after. Several of the kings of England have visited the Abbey, and knelt before the high altar, so that, without doubt, many a splendid pageant has passed along Caldcotes in its time.

I am reminded that the title of my paper is "Old Roads and Footpaths," so I must endeavour to say a few words upon footpaths, with which our own district is rich in the extreme; possibly no city in the kingdom is surrounded by finer, or has more of them. Almost in every direction you can, if you will, leave the highway, and wander along some ancient pathway, "far from the madding crowd," and through scenery of the loveliest kind, along the rivers and streams of the great plain of Cumberland. We have seen that some of our old roads date from pre-historic times. The paths are more ancient still. Men wandered upon these tracks before the time of roads at all, and in particular those by our river sides.

Primæval man, when he wandered through our valleys, would no doubt have good reason to keep by the river sides for the supply of his natural wants; and it is a remarkable fact that by nearly all our river banks the public have a right of way, constantly used for the most part by the people. Where there is not such a right, you may be sure that it has been interfered with at some time by some

selfish mortal who wanted to monopolise to his own enjoyment what was the birthright of his countrymen of every class and degree. Whilst advocating the free exercise of public rights at all times, I believe trespass should ever be denounced. Property in land has its rights, and also its responsibilities. These should ever be observed by all interested, and much would thus be done to preserve and conserve to the people their ancient rights of way, which have come down to us a priceless boon from the earliest times.

LIST OF FOOTPATHS.

BOTCHERGATE, BOTCHERBY, AND WETHERAL DISTRICT.

- 1.—Around Saucerics, and along side of River Eden.
- 2.—Across Saucerics by the Weavers' Bank.
- 3.—From Eden Bridge, around Swifts, by Eden Side.
- 4.—From Swifts Row, across Swifts from Turf Hotel.
- 5.—From Eden Bridge, across Sands to Swifts at Turf Hotel.
- 6.—From Botcherby Lane End, along Eden Side to Pow Maughan Beck, thence to Warwick Road near Waterloo Inn.
- 7.—From River Eden, along Old Eden by California Cottage to Warwick Road.
- 8.—From Eden Bridge, across Sands to Swifts at Watering Place.
- 9.—From Eden Bridge, along River side to Swifts.
- 10.—Skirting Stoney Holme, and continuing by Eden side to Botcherby Lane End.
- 11.—Across Stoney Holme, joining No. 10.
- 12.—From the Waterworks, by Petteril side, and over Bridge to Petteril Bridge and Warwick Road.
- 13.—From Petteril Bridge to Botcherby Mill.
- 14.—From Broad Street to Botcherby Mill.
- 15.—From Warwick Road through Durran Hill Park.
- 16.—From Botcherby Village to bottom of hill near Durran Hill House.
- 17.—From Harraby Toll Bar to lane near Petteril Bank.
- 18.—From Hill Top, London Road, along Petteril side to Carleton.
- 19.—From Carleton to Newbiggin Bridge and to Wreay, along the Petteril.
- 20.—From Upperby to Blackwell.

- 21.—From Carlisle to Durdar by the east side of Caldew, under Railway Arch and behind wood at Rifle Range.
- 22.—From Rifle Range foot Bridge east side of Caldew, past Farm House to Durdar and Dalston.
- 23.—From Carleton to Brisco.
- 24.—From lane nearly opposite Scotby Station, Midland Railway, to lane near Garlands.
- 25.—From lane at extreme south end of Scotby, by way of Scotby Shields to Wetheral Pasture.
- 26.—From Scotby, under North Eastern Railway, across Warwick Moor to Moorhouse.
- 27.—From Inn at Warwick to Holme House.

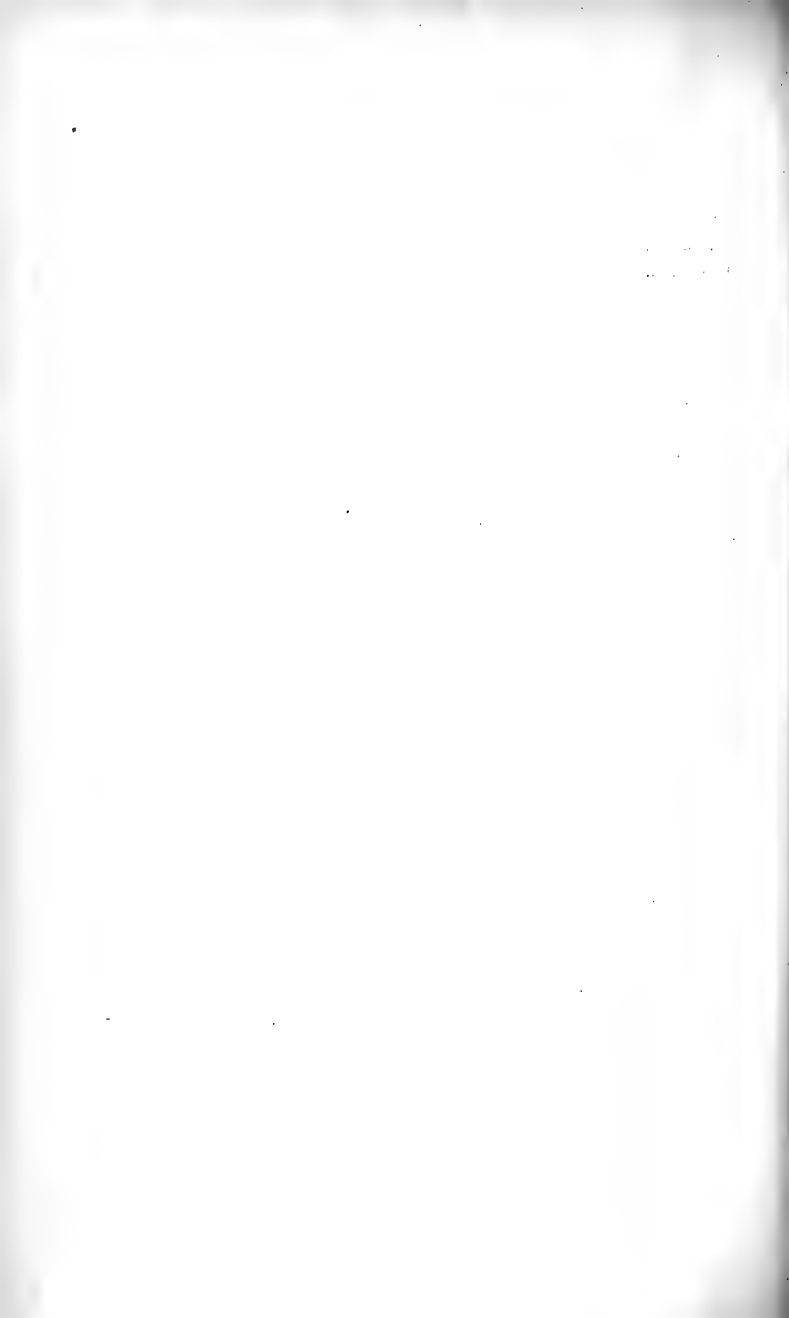
CALDEW GATE DISTRICT.

- 1.—From Moorhouse Road, below Cornhill, through lands belonging to Mr. James Sibson and Mrs. Mark, to Prior Rigg.
- 2.—Along the Banks of the Eden *via* the Bone Mill to Grinsdale.
- 3.—From Dalston Road by way of Newlaithes Hall to the Wigton Road.
- 4.—From Newtown to Raffles.
- 5.—From Newtown to behind Bellevue.
- 6.—From Cummersdale to Blackwell.
- 7.—From Holme Head to Cummersdale and Dalston on both sides of the River Caldew.
- 8.—From Holme Head Bridge to Blackwell Road.
- 9.—From Grinsdale to Kirkandrews and Beaumont.
- 10.—From King Rigg on the Wigton Road to Newby.
- 11.—From Little Orton to Prior Wood.
- 12.—From Cummersdale to Halfway Houses on Dalston Road.

STANWIX DISTRICT.

- 1.—From Eden Bridge, along Cricket Field, past and above the Baths, to Etterby Scour.
- 2.—The Old Footpath from St. Ann's Hill to Spa Well. (The Caledonian Railway Company have placed engine sheds and lines across this footpath.)
- 3.—From Edentown to Belah Gardens. (This was blocked some years ago by the late Mr. John Wright.)
- 4.—From the North British Crossing, Stainton, to Spa Well.
- 5.—Along the River side from Etterby Wath to Cargo, and then on to Rockliffe.
- 6.—Across Kingmoor, past Park House, to Kingstown Old Toll Bar.

- 7.—From St. Ann's Hill to Moorville, through Belah Gardens.
- 8.—From Kingmoor to Brunthill, by Chapel House.
- 9.—From Stanwix, through Knowefield Nursery to Tarraby.
- 10.—From the Mill House to Linstock.
- 11.—From Rickerby Park to White Close Gate.
- 12.—From Tarraby to Houghton.
- 13.—From bottom of White Close Gate, through Lane to Knowefield and
Tarraby.
- 14.—From Eden Terrace, along Eden side to Rickerby Holmes.
- 15.—From Houghton to Greymoor Hill.
- 16.—From Tarraby to Houghton, thence to Kingstown.
- 17.—Four a'Butt Lonning, from Gosling Bridge, Moorville, to Harker Grange,
and thence to Houghton House.
- 18.—From Kingmoor, by Lowry Hill to Kingstown.
- 19.—From Kingmoor, by South Wakefield to Moorville.
- 20.—From the Smithy at Houghton to Brunstock.
- 21.—From Etterby to Stainton.





THE IDENTIFICATION OF THE ROMAN STATIONS IN CUMBERLAND.

BY J. B. BAILEY.

(*Read at Maryport.*)

I MUST ask your kind indulgence in bringing the following paper under your notice. That the subject is an important one will be almost generally allowed, at least by antiquarians. That justice has been done to it in the past will not, at any rate, pass muster so easily; at least, to judge from the perfect maze in which we find ourselves when we come to ask what are the names of the various stations along the line of the Roman Wall. True, the names of the stations within the limits of Northumberland are given—and accepted almost without hesitation; but once across the Cumberland Border, this state of things exists no longer—chaos is at once evident. That this is no mere figure of speech, may be seen from the following list, which gives a few of the names that have been applied to each successive station after Amboglanna.

Petriana has been placed at Castlesteads, Old Carlisle, Lanercost.

Aballaba, at Watchcross, Stanwix, Brampton, Papcastle, and Castlesteads.

Congavata, at Watchcross, Stanwix, Burgh, Moresby, Brampton.

Axelodunum, at Burgh, Stanwix, Maryport, Drumburgh, Hexham, Bowness, Watchcross.

Gabrosentis, at Drumburgh, Burgh, Bowness, Malbrey, Skinburness, and Linstock.

Tunnocellum, at Bowness, Drumburgh, Skinburness, Stanwix, South Shields and Tynemouth.

Glannibanta, at Bowness, Lanchester, Old Carlisle, Ravenglass, Maryport, Morpeth, Tynemouth, Kirksteads, Whitley Castle.

Alionis, at Whitley Castle, Bowness, Jarrow, Burgh.

Bremetenracum, at Brampton, Drumburgh, North Shields, Ribchester, Boustead Hill, Whitbarrow.

Olenacum, at Maryport, Old Carlisle, Burgh, Drumburgh, Wardley, Blackrode, Ilkley.

Virosidum, at Maryport, Stanwix, Gateshead, Warwick, Adel, Warrington, Bowness.

That the whole subject is in an unsatisfactory state, we are not alone in thinking, for no less an authority than Dr. J. Collingwood Bruce, speaking on this state of affairs in his "Lapidarium Septentrionale," 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."

If, then, it be only to endeavour to dissipate this ignorance, it will be well to consider the various methods that have been employed from time to time to find "the key which will make all plain."

One theory can at once be dismissed;—for even the following absurdity is advocated by a writer who is apparently anxious to secure a Notitia name for a pet station. Near it was found a coin of Constantine, hence he infers it must have been occupied at any rate within measurable distance of Notitia times; ergo—it may have been a Notitia station!

In saying this much, I have not the slightest wish to throw ridicule on the labours of the many eminent antiquarians who have produced the list to which I have just referred; my only wish is to examine the methods by which they have arrived at their conclusions, as in the face of such a complicated list the matter can lose nothing by the ventilation. Of course one cannot treat so wide a

subject with the consideration it deserves, in the limits of a single paper; still, enough can be given in outline to bring out the main arguments, and to point out a fresh theory, should the old ones be found wanting.

We shall begin, then, by considering the principles that have been advocated by antiquarians in their attempts to unravel the much-vexed question as to the identification of the various stations, but specially with regard to those more immediately connected with Cumberland. For this purpose we shall divide the various authorities dealing with the subject into three classes, viz: First, Those who have been mainly guided by sound; Secondly, Those who have considered the question almost entirely as an etymological one; and, Thirdly, Those who have followed a much more rational principle, namely, that of geographical sequence, such sequence being decided—so far as the Roman Wall is concerned—by the Notitia.

Before dealing with these various classes, it may be as well, for a few moments, to clear the ground by a few general explanations. Thus, the "Notitia" of which we shall often have to speak, was the Military and Civil Service List of the Roman Empire. It is generally supposed to have been compiled towards the close of the Roman occupation of Britain; in fact, we are told that we may for certain reasons "infer, with some degree of confidence, that it was compiled in or about the year 403." (Hodgson Hinde, Introduction to *History of Northumberland*, p. 19.) It contains, so far as Britain is concerned, lists of the various stations, together with the garrisons, under the immediate government of the Dux Britanniarum and the Comes littoris Saxonici.

The "Itineraries of Antonine" give us the names and distances from each other of the towns and stations on the principal military roads. This great Itinerarium is supposed to have been compiled about A. D. 320. (*Celt, Roman, and Saxon*, 3rd Ed., p. 145.)

Another list is known as the Ravenna List. This was compiled by an "anonymous geographer of Ravenna, who wrote about the middle of the 7th century," this list being probably made from maps of the various provinces on which he treats. (*Celt, Roman, and Saxon*, pp. 145, 536.)

The Rudge Cup, of which we shall also have to speak, is an "ornamental bronze cup which was found in a rubbish pit at Rudge in Wiltshire more than a century ago, having the names of five towns (in connection with the Roman Wall) in an inscription round the rim. It seems to have been made for a club or society of persons belonging to these towns, probably hunters." (*Celt, Roman, and Saxon*, p. 257.) Dr. Bruce (*Lapidarium Septentrionale*, p. 206,) says, "it was intended as an offering to the presiding deity of some spring," and he apparently suggests Gilsland.

Having said so much, we are now free to enter upon the discussion of our question. As we have said, the first set of antiquarians has mainly determined its allocations on the strength of the similarity of sounds; i.e., granted that the modern name of a town bears a somewhat fanciful resemblance to the name of a Roman station, it was held that a correct allocation had been made. Thus Appleby, on this account, is supposed to be the modern representative of the ancient Aballaba; Ireby, of Arbeia; Moresby, of Morbium; Hexham (= Hextoldesham), of Axelodunum, etc. As a variation of this method, the Maryport camp is supposed to be the ancient Olenăcum, from the fact of the camp being near the Alne or Olne (now Ellen); the name Derventione, for a similar reason, being given to the camp at Papcastle. We can at once dismiss this method from our consideration, as, by the light of more recent investigations it has been shown, with a tolerable degree of certainty, that at least Arbeia and Morbium are in Yorkshire, and Derventione either in Durham or Yorkshire. (*Trans. C. and W. Arch. and Antiq. Soc.*, pt. 1, vol. iii. p. 93; *Arch. Æliana*, pt. 24, vol. viii. p. 287.) Axelodunum and Aballaba are also as clearly at other stations, as we shall shortly see.

The allocations made on the strength of etymology are likewise open to very serious objections; in fact, many leading antiquarians of the present day are apparently quite agreed that there can be no more uncertain method employed—and in truth we seem as though we ought to accept this as a final decision. But why? In the first place, too frequently the descriptions conveyed by an etymological rendering are such, that they may be made to suit,

not one station only, but several stations on the wall. Thus, following the Gaelic source, we have :—

Aballaba = The town on the bank.

Gabrosentis = The fortress on the river.

Axelodunum = The fortress on high ground.

Olenacum = The station on the hill.

All of which are certainly more general in their terms than we should have wished ; and hence, as such, the possibility of arriving at a just decision is rendered doubly difficult. But this difficulty, great as it is, is still further increased by the fact that such derivations are not derived from one stock, but from two. I of course refer to the Gaelic and Cymric branches of the great Celtic stock. Granted, however, that allocations *were* made on the strength of etymology, we shall evidently have to decide, in the first place, whether *all* the towns, or how many, owe their names to this method ; and, in the second place, from which of the two stocks the derivation has been made.

Clearly, it is assumed by those who have engaged in etymological speculations, that the names of *all* the towns have been so given ; i.e., in accordance with some geographical or other local feature in the immediate vicinity of such station. Now-a-days new towns are constantly coming into existence in different parts of the world, and their names, far from being etymologically derived, are the familiar names of the old country. Had the old Roman soldier no such sentimental ideas—no such love of home—no dwelling on old associations in his new home in a foreign country ? Surely such names as Uxellodum, Segodunum, Aballo, Alicana, Condate, Mediolanum, etc., speak strongly in favour of this love of home. Can we wonder, then, at the uncertainty of this method ? But this uncertainty can be shown in a still clearer light ; for not only do the authorities of each separate school differ in every allocation they make, but even when two or more allocations are made from the same stock, the same uncertainty exists—there are as many different names resulting as there are derivations. This may be better understood from the following table, where the first set of derivations are from the Gaelic, and the second from the Cymric.

<i>Notitia Name of Station</i>	<i>Gaelic Derivation*</i>	<i>Modern Allocation</i>	<i>Cymric Derivation†</i>	<i>Modern Allocation</i>
ABALLABA ...	Balla = a town, Ba = bank "The town on the bank."	Castlesteads ...	Y bala bach ... "The little hill."	Stanwix
CONGAVATA ...	Con = the height, Ga = an angle Vat = a ford "The station on the height at the nook ford."	Brampton ...	Con cafad = Comp gafad "The hollow round."	Burgh
AXELODUNUM ...	Uchel = high, Dun = fort ... "The fortress on high ground."	Watchcross ...	... ..	Drumburgh
GABROSENTIS ...	Gabr, Cadr, Cadir = a fortress, Os, Oz, Ouse = a river, En = on "The fortress on the river."	Linstock ...	Gafr rihos ... "Goat fell or marsh."	Bowness
TUNNOCELLUM ...	(1) (2) Dun a' chaoil "Fort of the firth."	Stanwix ... Bowness ...	Tyn o celch "The encircling Tyne."	South Shields
GLANNIBANTA ...	(1) Glan = glen, plain, Ban = boundary, height "The station at the boundary of the plain." "The station on the height in the plain." (2) Cladh na bhfianta ... "The heroes' camp."	Kirksteads ... Maryport ...	Glanybant "The brink of the height."	Tynemouth

<i>Notitia</i> <i>Name of Station</i>	<i>Gaelic Derivation*</i>	<i>Modern</i> <i>Allocation</i>	<i>Cymric Derivation†</i>	<i>Modern</i> <i>Allocation</i>
ALIONIS	Lona=marshy plain "The camp on the marshy plain."	Burgh ...	Y llion "The meeting of the floods,"	Jarrow
BREMETENRACUM ...	Bre (Briga)=a fortified town, Men (main)=stone, Tu= coast, Rac=a creek "The stone-built fort on the creeky coast."	Boustead Hill	Bre madryn (madyn) "Foxhill,"	North Shields
OLENACUM	Ol y nac "The station on the hill."	Drumburgh ...	Y llyn ach "The pool of water."	Wardley
VIROSIDUM	Vir=a bend, Os=projection, It=a confluence "The projecting bend covering the confluence."	Bowness ...	Mir ros=Fair Fell, Mir rosydd =Fair Fells	Gateshead

* *Trans. Cumb. and West. Arch. and Antiq. Assoc.*, pt. 2, vol. i. pp. 86, 148; pt. 2, vol. ii. p. 204.
† *Arch. Æliana*, pt. xxiii. vol. 8, p. 50.

From the above list it will be gathered that on the strength of the Gaelic derivations, all the twenty-three stations are placed actually *on* the wall, i.e., between Wallsend and Bowness, the apparent inference being that the Wall in itself was a perfect military barrier; whilst according to the Cymric derivation, only eighteen have been placed actually on the Wall, the superfluous names being placed at the mouth of the Tyne; the apparent inference here being that the Wall was *not* a perfect barrier, but that its weak point was at the mouth of the Tyne.

The question then is, Was the Wall in itself a perfect barrier, or was it not? and if not, where was its weak point? We should have no hesitation in allowing that it was *not* a perfect barrier, as indeed a mere glance at the map would show. Are we then to cast a reflection on the builder of the Wall? Granted that Hadrian planned and carried out the building of this mighty Wall—whose remains still speak eloquently of its former grandeur—we must allow that so great a master mind would certainly grasp the weakness of the situation, and guard against a possible outflanking of the Wall, by including a series of camps whose garrisons should effectually prevent such a thing taking place, or at least, render it exceedingly difficult of accomplishment if attempted. That the danger was real we have abundant proof in the appearances presented by the camps at Maryport (*Celt, Roman, and Saxon*, p. 452), Ribchester (*Ibid* p. 211), Papcastle *C. and W. Antiq. Soc. Jour.*, pt. 2, vol. 3, p. 342), and other places, for when they have been explored, abundant traces of fire were everywhere evident.

Thus, at a very early date there was an absolute necessity for a series of forts or camps on the west, the object of which was the prevention of the outflanking of the Wall by the Picts and Scots, who were ever ready to take any advantage that might arise. It is also certain that there was a series of camps to protect the eastern extremity of the Wall; but the necessity for such apparently occurred only at a much later period, i.e., when the Saxon pirates commenced their periodical descents on the coast. To check their ravages was the duty of the Comes littoris Saxonici (Warden

of the Saxon shore). Under him the fleet could act effectively so far as the northern half of the coast was concerned, although the camp at the mouth of the Tyne would be a very useful auxiliary.

If anything else were wanting to disprove this etymological theory, it may be found in the strange conclusions to which the various allocations bring us. Thus the 1st Cohort Spaniards—a military cohort—is placed at Drumburgh, i.e., in a camp which has an area of only three-quarters of an acre. To get them packed in so small a space would have been a sheer impossibility. Besides, even if the camp had been large enough, there seems no reason to account for the presence of so important a cohort in such a cramped position. The same remark applies also to the *Ala Herculea*, also placed at Drumburgh.

Again, the *Elia Classica* is placed at Stanwix merely on the supposition that this place may have been a seaport in Roman times. Where is the proof that it was? More than this, the Rudge Cup and Ravenna lists clearly disprove the allocations, as will appear shortly.

Speaking broadly, the third set of antiquarians, namely, those who favour geographical sequence, are divided into two classes:—(1) Those who, whilst agreeing to geographical sequence, fancy that the altars found at the western stations, when read by the light of the *Notitia*, seem to imply that there has been some inversion of the names in the *Notitia* list. (2) Those who agree that seventeen or eighteen of the stations are actually on the Wall itself, between Wallsend-on-Tyne and Bowness-on-Solway, the remaining stations being looked upon as supporting stations to the south of the Wall, either stretched across the county from E. to W., or at the western extremity. To these we might add a third set, namely, those who have indulged in etymological speculations, but we have shown such speculations to be of very doubtful character. Besides, arguments used during the discussion as to the views of the first two sets, will be useful in further deciding as to the strength or weakness of the contentions of this third set. We must first deal with those who apparently place such confidence in the power of the altars to unravel the mystery.

It has been stated that the Roman cohorts continued to reside in the stations which were assigned to them on their coming into Britain, and that they never moved from these stations without the most urgent necessity. (*Lyson's Cumberland*, c. lxiii.) This may have been the rule, but it certainly was one which had many exceptions, especially in the immediate vicinity of the Wall. Thus any allocation made on the strength of such rule ought to be received with a certain degree of caution. Still there are undoubted cases in which the allocations can be accepted as conclusive.

It has been stated that "when in the ruins of a station inscribed stones are found, bearing the name of a cohort mentioned in the Notitia, the inference is natural that, in most cases at least, the imperial Notitia will furnish us with a key to the ancient designation of the station. The argument becomes irresistible when, in several successive instances, the designations thus obtained correspond exactly with the order of the places as given in the Notitia." (*Cumb. and West. Antiq. and Arch. Soc. Trans.*, pt. i. vol. 3, p. 64.) On the face of it, this seems a most reasonable and effective method; still, it is one that we cannot accept without the strictest investigation, as on the very surface difficulties appear. Thus, two or more cohorts may be shown by the altars or inscriptions to have been stationed at the *same* camp. According to the Notitia, each of these cohorts may have been stationed at a *different* camp. How are we to decide in such a case? for two or more names could not be applied to the same station. As a case in point, the 2nd Cohort of the Lingones, according to the Notitia, was at Congavata, and the 2nd Cohort of the Thracians at Gabrosentis, both stations "per lineam valli." Altars dedicated by each of these cohorts have been found at Moresby. Hence, according to the theory above propounded, this place may be either Congavata or Gabrosentis. As it cannot be both, which is the right one, if either?

To reverse the case. Altars or inscriptions by the 1st Cohort of the Dacians, stationed at Amboglanna, according to the Notitia, have been found at Birdoswald, Lanercost, Netherby, Old Wall, and Bewcastle; by the Ala Petriana, stationed at Petriana, at

Lanercost, Hexham, Kirkby Thore, Plumpton Wall, and Carlisle; and by the 1st Cohort of Spaniards, stationed at Axelodunum, at Maryport, Netherby, and Ardoch. In such cases, how can we hope to have the slightest chance of deciding to which stations we shall apply the Notitia names?

But, for another reason, this theory is uncertain, for it cannot be final. One might well ask, Supposing that within the next few years we have discoveries of other important altars, how would the allocations be affected thereby? Shall we in such cases have to begin the allocations over again? If so, this is not a very cheering prospect for those who expect to find "the key that shall unravel the mystery" in the altar theory. That this is no fanciful argument, we shall see by taking the case of Ribchester. Originally considered to be the Rigodunum of Ptolemy, the name next selected for it was Coccium (Iter x.), but even this name is now in danger of giving place to another, for we are told (*Celt, Roman, and Saxon*, p. 64) that "an altar, now preserved in St. John's College, Cambridge, which has only recently been correctly read, seems to identify Ribchester with Bremetonacæ, in which case the Roman topography of this district requires a new investigation and re-arrangement." J. Hodgson Hinde again, suggests that the name on the altar is not Bremetonacæ, but Bremetenracum. (*Arch. Æliana*, vol. iv. pt. 2 o.s., p. 112.) How then are we to secure finality?

Surely, then, a theory which introduces so many probabilities and possibilities, ought to be looked upon with grave suspicion. Moreover, we must not expect the Notitia to prove anything and everything. When it states that a cohort was present in a certain camp, we are surely to infer that such statement refers to a fact which was true in Notitia times; but to infer that therefore it was true for times far removed from Notitia times, is to put upon it a construction that it evidently will not bear.

As there seems, then, no possibility of proving geographical sequence by altars. An ingenious method has been devised to account for the apparent failure in the plan. Altars having been found at Papcastle, Moresby, and Maryport, apparently identifying

them as Aballaba, Congavata, and Axelodunum, the idea grew that somehow the list had got inverted. The following list illustrates this method.

	<i>Ferguson.</i>	<i>Longstaffe.</i>	<i>Watkin.</i>
<i>Petriana</i>	Castlesteads	Old Carlisle	Old Carlisle
<i>Aballaba</i>	Papcastle	Papcastle	Papcastle
<i>Congavata</i>	Moresby	Moresby	Moresby
<i>Axelodunum</i>	Maryport	Maryport	Maryport
<i>Gabrosentis</i>	Malbrey	Skinburness	
<i>Tunnocellum</i>	Skinburness	Bowness	
<i>Glannibanta</i>	Old Carlisle (?)		Whitley Castle
<i>Alionis</i>	Bowness		
<i>Bremetenracum</i>	Drumburgh		
<i>Olenacum</i>	Burgh		
<i>Virosidum</i>	Stanwix		

But it may not be unreasonable to point out that several apparent inconsistencies appear in the allocations already named on this plan.

Thus, at Old Carlisle, if it be Glanvoenta, we have in Notitia times the Coh. I. Morini. But such a regiment stationed here would surely be of but little use; apparently we require a cavalry regiment, to judge from the network of roads radiating to all points of the compass, and that such a regiment was stationed there, we have abundant testimony in the altars found near the station. For the same reason, the 6th Cohort Nervians would scarcely be a satisfactory garrison for Stanwix, with its important connections. Here, especially, would a cavalry regiment be an absolute necessity.

Again, the position of a cavalry regiment at Burgh seems quite inexplicable; and although the presence of a cavalry regiment in the earlier portion of the Roman occupation was an absolute necessity at Maryport, such does not seem to have been the case at a later period.

Still, we may fairly ask whether there is any probability that we may ever be able to rely upon the unsupported testimony of altars. To do so implicitly, we should require to have certain information on at least two points, viz: (1) That the cohort mentioned in the

Notitia can be definitely proved to have been at the station to which we wish to give the name, in or near Notitia times. (2) That all the altars have been found that are likely to be found. The bearing of the latter has already been shown when speaking of Ribchester. To these a third point has been insisted on, viz., that there is a certain amount of credibility to be attached to an allocation, when it can be proved that a cohort has been at a station for a considerable period of time.

As to this idea of continuity, we might endeavour to settle this matter by a consideration of the various dates at which the stations were held by certain cohorts, in so far as these dates can be inferred from the altars. Let us, in the endeavour to do this, take the Maryport camp as a typical example. According to the Notitia, the 1st Cohort of the Spaniards was stationed at Axelodunum, of course in Notitia times. Now, some sixteen altars, by six different dedicators, have been found near this camp, and hence it has been inferred that the position of the ancient Axelodunum has been determined. Apparently such inference is the only one that could logically be drawn; but, after all, a close consideration of the matter will show that the reality is in appearance only, not in fact.

Of course, the finding of these altars points indisputably to the fact that Spanish cohorts *were* in garrison at the Maryport camp, but they do not therefore prove that the cohorts were present in Notitia times. But to remove the matter from the range of mere speculation, the date of such occupation can be certainly fixed, for some four of the altars were dedicated by Marcus Mænius Agrippa, a tribune of the Spanish cohort who lived during the reign of Hadrian, and therefore about the year A.D. 117. That they left is certain, for not only have we proof of their presence in North Britain, but they were at Netherby about A.D. 221. More than this; we have unmistakable proof of the presence of Dalmatians during the reign of Antonius Pius, A.D. 137—160. And we have to account for the presence of at least a third cohort, the Bætasiensians—but whether before the Dalmatians or after them, we have no direct evidence. But a careful consideration of the great find of altars in 1870 may probably answer, not only that question, but also that of the cohort that buried the altars.

Two facts are brought very prominently under our notice in the account that is given us respecting the discovery of these altars in the *Lapidarium Septentrionale*. They were not buried each in a separate pit, but in some cases two and three in one pit, one above the other. Nor do the altars interred in the same pit all belong to the same cohort. But the question as to who buried them is apparently set at rest, for in one case at least, a Spanish altar is buried *above* a Bætasian one, from which we must infer that the Bætasians at least buried the altars in that pit, for the Spaniards could not bury their altars *above* those of their successors. In the same way, we have a Dalmatian altar buried above a Bætasian altar; and this apparently points to the conclusion that the Bætasians buried this lot also. Moreover, they must all have been buried, almost certainly, at the same time, else the second burial would have discovered those of a previous one.

If this be so, then we have the sequence of cohorts as—first Spaniards, then Dalmatians, and after these Bætasians; and, indeed, the general appearance of the altars bears out this theory, as I have attempted to show in an earlier paper (“The Maryport Camp—What was its Name?” *Transactions*, No. xii.) As certainly the date of the interment must have been an early one. Strangely, the list of coins found shows a break in continuity between A.D. 200 and A.D. 240. Can the interment have taken place somewhere between these two dates? Dr. Bruce agrees that it was so, for he says (*Trans. C. and W. Arch. and Antiq. Assoc.*, 1870, p. 175), “The latest of these altars probably belongs to the reign of Antonius Pius,” and “they were buried at least two centuries before Stilicho.”

It is evident that, if buried by either Dalmatians or Bætasians, the date could not have been in Notitia times, for then the Dalmatians were at Brancaster and Broughton, and the Bætasians at Reculver (*Celt, Roman, and Saxon*, p. 307). But if it be held that they were buried by Spaniards, then it must have been by a returned cohort. But where are the altars that prove this point? for those found in 1870 and 1880—and almost as certainly those found previously—are clearly out of evidence.

That a cohort *did* occupy the camp after the withdrawal of the Bætasians we may argue from the acknowledged importance of the station, as also from the unbroken succession of coins after A.D. 240 down to Notitia times.

That the *Spanish* cohort did *not* return, I shall attempt to show shortly, its presence in the later empire being apparently required elsewhere.

So far, then, as the Maryport camp is concerned, we have found no proof of continuity; but, on the contrary, frequent changes. Had we taken other stations along the line of the Wall, in connection with the Dacians, Tungrians, Ala Petriana, etc., we should doubtless have arrived at the same conclusion. In fact, the words used by Dr. Bruce with regard to the Maryport camp may, with equal justice, be applied to other camps. He says (*Trans. C. and W. Arch. and Ant. Assoc.*, vol. i. p. 187), "The diversity of troops named on the altars shows that a quicker exchange took place than was usual."

It is true that altars have been found apparently supporting the idea of an inversion; but then, as I have attempted to show, altars may be made to prove almost anything; and only let the idea of inversion be granted, the chaos in which we are now placed will become even more pronounced. We must first clear away the altars from our minds altogether—they have not been found necessary in deciding hundreds of places in other parts of Britain, and they are not an absolute necessity even here.

If, then, our argument be sound with regard to the Maryport camp, the case for inversion fails in a very important particular. Moreover, only three stations out of eleven have been decided on the strength of altars, namely, Maryport, Moresby, and Papcastle. The very slender character of the clue, so far as the two former places are concerned, has already been pointed out, and we shall presently have something to say to the same intent with regard to Papcastle. Still, without accepting this as a final decision, we shall have to consider the question by the light of other existing lists, to see whether they corroborate or refute such conclusions.

At least two lists will need our consideration. First we shall take the list of names on the Rudge cup, and secondly, a selection from the Ravenna list. These two lists are :—

<i>Rudge Cup.</i>	<i>Ravenna.</i>
Banna	Æsica
Amboglanna	Banna
Uxelodum	Uxeludiano
Aballava	Avalaria
Mais	Maia
	Fanocedi

Taking the first of these lists, we may be fairly allowed to draw the inference that all the stations were placed somewhat closely together. It may, of course, be argued that this is but a gratuitous assumption ; still, we must remember that it was the policy of the Romans to isolate the cohorts of like nationality, and for very obvious reasons. Thus, in all probability, friendships sprang up amongst the garrisons of the neighbouring stations. Hence we may with tolerable certainty assume that the hunters of Banna, whoever they may have been, drew round themselves a set of kindred spirits, actuated by the same object, and selected from the neighbouring stations. What that object was we can only surmise, but Dr. Bruce seems to think that the Rudge Cup was a libation cup. If so, and Maryport was the Axelodunum of the Notitia, we might well ask what interest the hunters of Banna could have in a station so distant as Axelodunum, or how the garrison at the latter station could ever join in the libation, the hunt, or whatever else was intended ; for we must remember that wherever Banna was—and its position is by no means certain—still it was in the neighbourhood of Esica and Amboglanna—a fact very clearly demonstrated. The Ravenna list points to the same conclusion.

Apparently, then, these lists lend no authority to the theory of inversion. We may still ask with propriety what use an inverted list would be. The Notitia is either a correct list or an incorrect one. If correct, it cannot be inverted ; if inverted, it cannot be a record of what existed. As the last important Roman list connected

with this country, we should expect it to be at least of equal authority to the Itineraries of Antonine. That the necessities of the case required a perfect list we may rest assured ; otherwise what use would an inverted list—accidentally inverted, too !—be to a Roman general, unless indeed to lead him on to disaster. That such was not the characteristic of the Roman topographer we may readily allow.

Baines, in his *History of Yorkshire*, pt. 1, vol. i. p. 316, says : “It gives one a very high impression, not merely of the industry of Ptolemy and the earlier geographers, but of the immense pains taken by the Roman government, that even an attempt should have been made to fix the position of so many places, especially in the British Islands, at a time when not more than one half of their total area was subject to the Roman dominion, and when even that portion which they professed to rule was very partially subdued.” And this statement applies to those of later date with even greater force.

Clearly, then, the Romans were very particular as to having a correct knowledge of the leading topographical details of the country. Their military roads, as given in the various Itineraries of Antonine, are wonderful specimens of their work, and show the places in almost unbroken sequence ;—as military lists they would otherwise have been valueless. It would seem very unlikely that the Notitia should be of less authority than the older Itineraries.

But it has been remarked that many of the sepulchral monuments refer to the heirs of the deceased persons, and that this might be looked upon as a proof of continuity. Thus, amongst others found near the Maryport camp, is one inscribed :—

D. M.
MORI REGIS
Filiū Heredes
Eius Substitutue
Runt vix a lxx

But this proves little, as, even should it prove continuity, it does not necessarily prove the continuity of the Spanish cohorts ; for

there is nothing by which we can show that Morus-Rex was a Spaniard, or that the stone itself was representative of the Spanish cohorts. More than this, if the argument is to hold good, we may the more certainly argue that the Spanish cohorts settled for some considerable period at Ardoch in North Britain, for they were clearly there after they had been at the Maryport Camp. There we have a sepulchral monument by the heirs of a centurion of the 1st Cohort of the Spaniards. The inscription is—

Dis Manibus
Ammonius Da
mionis C Coh
r Hispanorum
Stipendiorum
xxvii Heredes.

F C

(For a fuller discussion of this question, see "The Maryport Camp—What was its Name?" *Transactions*, No. xii.)

There is thus an undoubted weakness running through the length and breadth of this method of allocation, and till some better method of allocation be propounded, we must continue to doubt the correctness of the allocations fixed by this method. Time, or continuity, *must* be proved; probability is not certainty, and no system can be sound which tries to patch up a method to suit the altars. Should the altars suit the allocations arrived at by another method, so much the better. We must draw our inferences from observed facts, not seek facts to establish a theory, however plausible it may appear.

But not to multiply cases,—a very simple argument might have shown how very unreliable this method would be likely to be. Suppose a cohort to have been stationed at, say Maryport. Suppose further, that its presence there was testified to by the erection of altars. Suppose yet again, that the same cohort had also been stationed at Papcastle, and to have testified to its presence there by an entry of the name of the station in a book or official list. Suppose yet again, that after a lapse of 1500 years some enthusi-

astic antiquarian unearths the altars at Maryport, would he be justified in saying that the ancient camp of Papcastle had been found, merely because there is agreement between altars and list? Clearly such reasoning would be absurd.

For a few moments we shall now have to consider the views of the other set of antiquarians, who, leaving altars entirely out of consideration, agree as to the fact of geographical sequence pure and simple. Even this set is not unanimous in its allocations, for whilst one portion accepts Watchcross as a permanent station, another portion rejects its claims. Thus, *with* Watchcross as a station, we have eighteen stations—and *without* it, seventeen stations—actually on the Wall, the remaining six, in the latter case, being drawn across the isthmus from Tynemouth to Maryport. These views are shown in the following table:—

	<i>Horsley and Wright.</i>	<i>Hodgson.</i>
<i>Tunnocellum</i>	Bowness	Tynemouth
<i>Glannibanta</i>	Lanchester (Horsley)	Lanchester
<i>Alionis</i>	Whitley Castle	Whitley Castle
<i>Bremetenracum</i>	Brampton or Plumpton	Brampton or Plumpton
<i>Olenacum</i>	Old Carlisle	Old Carlisle
<i>Virosidum</i>	Maryport	Maryport

J. Hodgson Hinde (*Arch. Æli.* Vol. iv. pt. ii. p. 109, o.s.), however, combats this view of supporting stations, placing *Bremetenracum* at Ribchester, *Olenacum* at Ilkley, and *Virosidum* at Adel. In the face, however, of the unanimous testimony of both sections of antiquarians who favour geographical sequence, whether by means of altars or otherwise, we can leave this objection without further consideration.

We must therefore at once face the difficulty if we are to hope for success. True, the idea of geographical sequence is practically conceded; but how it is to be applied is by no means so unanimously agreed upon. Speaking on this point, Dr. Bruce (*Lapidarium Septentrionale*, p. 270), says, “as all stations which have been indisputably identified form an unbroken chain proceeding from east to west, we should expect the same state of

things to continue until the catalogue was exhausted." Whilst Mr. Ferguson, (*C. and W. Antiq. Trans.*, vol. 3, p. 93), after discussing the two sets of stations in sections 52 and 63 of the Notitia, says "that the Notitia always gives military stations in geographical sequence, and not any how." Granted then that the accuracy of the Notitia list has been so abundantly proved to be correct up to Amboglanna, it appears as though we might take it as a safe guide in fixing the remaining stations. Of course in this case there will be an undoubted difficulty, as there are more camps than there are available names, but that this difficulty is more apparent than real will appear as we proceed with our argument. We need scarcely ask to whom we owe the Notitia list. Clearly it is not a complete list of *all* the camps on the Wall, or in its immediate vicinity. Why then are some admitted, and others omitted?

It must be remembered that when the Duke of Britain assumed the sole command, his forces were much less than his predecessors had, and this through the withdrawal of the 20th legion. Consequently he would have to make the most of the reduced forces under his command, and that numerous changes took place in the various garrisons we may assume with a tolerable degree of certainty. If this be so, we have an additional element of uncertainty as to the altar test.

Clearly there was no necessity that he should preserve to us in his list the name of *every* camp within his command—certain of them were of much greater importance to him than others—what then more natural than that he should select those most fitted for his wants, and that therefore the names of these places alone are preserved to us? That the majority of the changes would be on the western flank we have shown to be a fair subject for discussion.

We ought, then, if we are to identify these places, to look upon the Notitia list as an exact skeleton, so to speak, of all the more important stations under the command of the Duke of Britain—important, so far as those not actually on the Wall itself are concerned, as strategic points; as opposed to mere, what we may term, way side stations. Such places would most certainly be

placed at the intersection of important strategic roads, so as to cover every possible want in the matter of providing ready and efficient help in all dangers that might threaten both the eastern and western ends of the Wall. In short, his organisation would be military rather than political, and its centre was evidently Eburacum, the legionary headquarters. A glance at a road map will show how perfect these arrangements were on both hands.

The road running northward from Eburacum divides at Cataractonium. One part—Iter. 1—pursues its northward course, crosses the Tees (ad Tisam) at Piercebridge (Magæ?), and soon arrives at the important strategic centre Vinovia, (Binchester on Wear), whence the road runs to Chester-le-Street (Epiacum?) on the one hand, and to Lanchester (Longovicum?) on the other, each of these places in turn becoming the centre of a series of roads communicating with various points on the eastern half of the wall.

Returning to Cataractonium, the second part of the road—Iters. 2 and 5—crosses Stainmore, successively passing Lavatre (Bowes) and Verteræ (Brough), till it arrives at Braboniacum, which has been identified with the modern Kirkby Thore. As on the eastern branch, so on this western, a number of strategic roads break away covering the western half of the Wall, as those on the east covered the eastern half. Thus, the first road radiating from Kirkby Thore was the Maiden Way, viâ Whitley Castle (Fanocedi?) to Magna, then—Iter. 2 and 5—viâ Brocavum and Voreda to Luguwallum, and lastly viâ Whitbarrow, thus communicating by a series of strategic points with all the most assailable portion of the command of the Duke of Britain, i.e., from Birdoswald to Moresby.

We have then first to fix the names of the stations from Amboglanna up to and including Moresby. In all there are at least twelve camps. These camps are Lanercost, Castlesteads, Brampton, Watchcross, Stanwix, Burgh, Drumburgh, Bowness, Skinburness, Malbrey, Maryport, and Moresby. Now some of these stations are of much less importance than others, hence, according to the ideas already advanced, they would not have *Notitia* names. Thus, *Watchcross* is favoured as a *Notitia* station by Lysons, Horsley, Wright, and Mc.Lauchlan alone. Dr. Bruce

(*Roman Wall*, ed. 3,) says "it was probably not a permanent camp, but only a summer camp, as no remains of ramparts have been found other than of earth." *Drumburgh* we have already shown to have been wanting in the essentials of a Notitia camp, whilst, according to the principles we have already enunciated, *Skinburness* and *Malbrey* must be rejected with the two former. We are thus left with eight places, all of which show tolerably satisfactory claims to being Notitia stations; hence to these we allot the eight Notitia names after *Amboglanna*, as follows:—

		<i>Recognised as Notitia stations by</i>
<i>Petriana</i>	Lanercost	Maughan
<i>Aballaba</i>	Brampton	{ Godwin, Camden, Horsley, Hodgson, Wright, Maughan, Mc.Lauchlan
<i>Congavata</i>	Castlesteads	} Practically unanimous
<i>Axelodunum</i>	Stanwix	
<i>Gabrosentis</i>	Burgh	
<i>Tunnocellum</i>	Bowness	
<i>Glannibanta</i>	Maryport	
<i>Alionis</i>	Moresby	Ferguson, Longstaffe

The garrison of *Petriana*, according to the Notitia, was the *Ala Petriana*. Inscriptions by this *Ala* have been found at Hexham, Carlisle, Plumpton Wall, and Kirkby Thore, together with Lanercost. Hexham could scarcely claim to be the *Petriana* of the Notitia, and the names of Carlisle, Plumpton Wall, and Kirkby Thore, are known almost beyond dispute. We are therefore left with Lanercost, to which, being next in order to *Amboglanna*, we give the name *Petriana*. This, it may be noticed, is an allocation corroborated by inscriptions, and as such ranks with the Northumberland stations. Besides, it was a very suitable station for the *Ala Petriana*.

Brampton was apparently a strong position; hundreds of cart-loads of stone have been taken from it, and the ground is still strewn with stony fragments, tiles, etc.; and, more important still, it appears to have been held at a late period, as some five thousand

coins of the later empire have been found. True, it was almost direct south of Castlesteads, but it was on what is known as the Stangate, and in direct communication with Castlesteads, and also with Voreda and Brocavum: and hence was of strategic importance. According to the *Notitia*, its garrison was a *Numerus Maurorum Aureliatorum*—clearly not an old established company on the Wall, as indeed the term *Numerus* implies. (*Arch. Handbook*, Godwin, p. 22.) The Rudge Cup apparently favours this allocation. As we have already said, its intention was apparently that of a libation cup, used by the *Hunters of Banna* and their friends, in a circuit comprising the towns named on the cup. Thus, beginning at Banna, we leave Magna (Mais?), and then by way of the Stangate viâ Aballaba, arriving at Axelodunum (see next paragraph); returning to Amboglanna by the Wall, where it was again near Banna. And this order also agrees with the Ravenna, which, keeping the Wall, passes Esica, Banna, and Axelodunum; returning by the Stangate to Aballaba and Maia, both to the south of the Wall, and so on to Fanocedi (Whitley?), and Brocara (Brougham).

We now come to the name Axelodunum (Uxelodunum). This name appears in the following three lists, viz:—

<i>Notitia.</i>	<i>Rudge Cup.</i>	<i>Ravenna.</i>
Esica	Banna	Æsica
Magna	Amboglanna	Banna
Amboglanna	Uxelodum	Uxeludiano
Petriana	Aballava	Avalaria
Aballava	Mais	Maia
Congavata		Fanocedi
Axelodunum		Brocara

Here then we have three independent lists, all pointing to the fact that Axelodunum—wherever it was—was in the neighbourhood of Amboglanna, the last of our identified stations. Taking the *Notitia* as our guide, it is the fourth station after Amboglanna, and is therefore probably within some fifteen or sixteen miles of that station. If this be so, the name must unquestionably be given to

Stanwix, the striking similarity between the three lists strongly favouring such conclusion.

If this allocation be correct, the garrison was the *1st Cohort of the Spaniards*. Now an equestrian cohort would be undoubtedly placed at such an important station, at any rate late in the empire. To go back a little in the history of this cohort; about the year 120, as we have shown, it was at Maryport, but removed a short time afterwards, apparently into North Britain, at Ardoch, in advance of the Antonine Wall. In the ordinary course of events it would then return, and doubtless take up its position at Stanwix. The position of this station seems to necessitate the presence of a cavalry cohort. True, the station was only a small one—too small, in fact, for so large a cohort; but, when we consider that it would probably have to assist in the defence of Luguwallum, as well as the advanced post at Netherby—the *Castra Exploratorum* of the *Notitia*—the difficulty at once vanishes; at least one authority, Mc.Lauchlan, agrees with this allocation.

That Bowness—or at any rate Skinburness—is *Tunnocellum*, is strongly supported by eminent antiquarians, including Lysons, Ferguson, Longstaffe, Horsley, and Wright. According to the *Notitia*, the garrison of *Tunnocellum*, the 18th station in the *Iter*. “*per Lineam Valli*,” consisted of the *1st Cohort Elia Classica*, i.e., a Cohort of Marines. Hence, we may very reasonably suppose that *Tunnocellum* was a town on the sea coast, and, following the order of sequence, on the West Coast. Although altars, etc., have been found here, still there are none that testify to the presence of the *Elia Classica*, but, as I have attempted to show, they are not needed. But etymology—without, however, placing too much trust in it—comes to our aid. The Rev. W. Lytteil, writing to me on the subject, says, “I regard *Tunnocellum* as derived from the Gaelic *dun a' chaoil*, signifying “the fort of the firth—or, the fortress of the strait.” By adopting this derivation the difficulty vanishes. How very aptly it suits the position of the camp at Bowness, the map of Cumberland bears abundant testimony; of the two places I should certainly prefer Bowness as the site of the ancient *Tunnocellum*.

The claims of the Maryport camp to be *Glanoventa* (*Glannibanta*),

I have already discussed at length ("The Maryport Camp—What was its Name?" *Transactions*, No. xii.), but a short *resumé* may be not out of place. Amongst the various names applied to this station we find Axelodunum, Glanoventa, Olenacum, Virosidum, and Volantium. The name Volantium may be speedily dismissed, whilst of the other four, one—Axelodunum—has been decided merely on the testimony of altars; but as I have shown the inefficiency of this method of proof, and have placed Axelodunum elsewhere, we must also dismiss this name, if the argument be sound. I shall have occasion shortly to speak of two of the remaining three in connection with other stations, and thus, for the present, we shall merely refer to the name *Glanoventa*, which is next in sequence. There is probably not any direct authority favouring this allocation, though it has been stated by Dr. Bennet (*Lysons' Cumberland*, p. cxlii.), 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 Antonius," whilst Baines (*History of Yorkshire*, vol. 1, p. 331) says it is either Cockermouth (Papcastle?), or some town on the coast of Cumberland. That it would form an admirable termination to the 10th Iter., must, I think, be admitted; and if this be allowed, it at once places the 10th Iter. on an equality with all the other Itinera with regard to their apparent plan of starting or ending at a seaport. Into the vexed question of the 10th Iter. we cannot enter, that would require a paper by itself; but, granted that Maryport is Glanoventa, and that authorities are also correct in allocating Galava at Keswick, Alone at Ambleside, and Galacum at Kendal, much has been done to decide this vexed point.

Canon Mathews, in a recent paper, says that "the total mileage to Glanoventa agrees with the position of either Whitley Castle or Old Carlisle." We may add that Maryport fulfils the same conditions.

That Moresby was a Notitia station we may well accept on such eminent authority as that of Longstaffe, Watkin, Dr. Bruce, and Ferguson, and its name, still in sequence after Glannibanta, would be Alionis. According to the Notitia, the garrison was the 3rd

Cohort of the Nervians, but no altars or inscriptions have, as yet, been found testifying to their presence here. Still, having been at Whitley Castle, Chesterholm, and Brough (Stainmore), all of them within the immediate defences of the wall, they might very easily have been transferred to Moresby in the Notitia times, when the Duke of Britain clearly made a re-disposition of at least some of his troops.

We are now clearly at the limit, so far as the main defences of the Wall are concerned, and we have three Notitia names yet to account for. We must hence enquire what camps are best suited for communicating readily and expeditiously with the stations already named, i.e., from Moresby to Birdoswald, and connecting them in turn with the head-quarters (Eburacum). Acting on the suggestions already thrown out, there are, strangely, just sufficient strategic points to exactly coincide with the three names still remaining. Hence our allocations will be :—

<i>Recognised as a Notitia Station by</i>		
<i>Bremetenracum</i>	Papcastle	} Ferguson, Longstaffe, Hübner, { Watkin, Jackson
<i>Olenacum</i>	Old Carlisle	Generally agreed on
<i>Virosidum</i>	Whitbarrow	Lysons

According to the Notitia, the garrison of Bremetenracum was a Cuneus Armaturarum, i.e., a body of men-at-arms. We must not, I think, assume that this was necessarily a *small* body, and that, therefore, it would only require a small camp for its protection. Lavatre, Verteræ, and Braboniacum were, at the same time, defended by detachments, and yet they were camps of undoubted size and strength. Two inscribed stones have been found at Papcastle, both referring to the Cuneus Frisionum Aballavensium. Mr. Jackson says (Vol. 4, *C. and W. Antiq. and Arch. Assoc.*, p. 136) that this proves Papcastle to have been Aballaba, whilst Dr. Bruce (*Roman Wall*, Ed. 3, p. 373), speaking of the inscription, says, that "it is a designation which it is difficult to describe." To my mind there is no difficulty at all, if we at once divest our minds as to any preconceived notions derived from altars, &c. Is it not

more likely to relate to a Cuneus *from* Aballaba, rather than to one actually *at* Aballaba? It must be observed that the Notitia garrison of Aballaba was a Numerus *Maurorum* Aurelianorum, i.e., a company of *Moors*—the Aurelian, whilst the Papcastle inscription is a “Cuneus Frisionum Aballavensium,” i.e., clearly a company of *Frisians*, the Aballavensium, otherwise, a company of Frisians from, or belonging to, Aballava.

Now, Frisians were from the coast of Holland, and hence could have no claim to be called *Moors*. Thus the Papcastle inscriptions cannot by any stretch of the imagination give the slightest countenance to the name Aballava as applied to Papcastle.

True, the inscription refers to the presence of a company of Frisians—the Aballavensian—but this does not necessarily prove that Papcastle was Aballava. We may as well argue that because a certain English regiment is called the Cumberland regiment, that therefore the place where it is stationed is necessarily Cumberland. The very idea is absurd.

But we may probably have some little confirmation of our allocation. The Notitia garrison of Bremetenracum is a Cuneus *Armaturarum*, i.e., a company of men-at-arms—whether *Moors* or *Frisians* is not stated—but still it is a Cuneus, and in so far is in perfect agreement with both the inscriptions found.

Time will not allow us to enter more fully into the antiquities of Papcastle, although to clearly establish our claim it must be pointed out that Papcastle was a most important strategic centre, roads running to Moresby, Maryport, Old Carlisle, and the Wall.

The next point of strategic importance—I might say the most important point—is Old Carlisle. That it was a Notitia station is almost generally allowed, though its Notitia name varies according to the different writers. The perfect network of roads radiating from this station at once bear direct testimony to its great strategic importance. Its name—following again in direct sequence—would be Olenacum; and this is the name that has already been given to it by Horsley, Hodgson, Wright, Mc.Lauchlan, and Godwin.

The Notitia states that the garrison of Olenacum was the *Ala Herculea*. That an *Ala*, as distinguished from a *Cohort*, should

be stationed here, seems to confirm the allocation. Besides, several altars of the Ala Augusta have been found here, and it has been suggested that this same Ala had various names, according to the Emperor. If so, and the continuity be proved, then the allocation is fairly assured.

Moving still further away, but in the direction of the direct communication with the ITERS. 2 and 5, the next important station to my mind seems to be Whitbarrow. To this station, then, I propose to give the last remaining name on our list, namely, Virosidum. That it was an important camp, its size, position, and connections at once prove. True, it is a station that has received but passing notice, yet Lysons (*Hist. of Cumberland*, p. cxxxvii.) considers it "to have been a place of some importance," whilst (*Ibid.* p. cxlv.) he further seems to have considered it to have claims to rank as a Notitia station, and to have been named Bremetenracum. Its garrison must have been the 6th Cohort of the Nervians, as this cohort was apparently stationed at Esica (Great Chesters), and also at Brugh (Yorks), it would have been easy to transfer it to Whitbarrow. A mere glance at the map of Roman Cumberland will at once show its strategic importance, and a visit to the camp will more than bear this view out. In fact, roads radiate to all points between Magna—which it reaches viâ Plumpton—and Whitley Castle, and Moresby. Its most important connection is that with ITERS. 2 and 5, by which the line of communication was kept up with Eburacum, the headquarters of the Duke of Britain, as I have already shown.

Thus, its position amongst the camps at Kirkby Thore, Brougham, Plumpton, Keswick, Old Carlisle, places it, so to speak, as practically the focus of all the strategic points, covering from Moresby to Magna, and their connecting link with headquarters. More than this, Whitbarrow and Papcastle bear exactly the same relation to one another that Bowes and Brough do, for whilst the latter are placed one on each side of the pass over Stainmore, so guarding that important pass, the former guard the pass through the heart of the lake mountains, being likewise placed one at each end of such pass; this may be something more than an undesigned

coincidence. We have thus established an unbroken circuit of camps from Eburacum viâ the 1st. Iter., thence along the Wall from east to west, and back again to Eburacum viâ the supporting stations and the 2nd or 5th Iters.; and if there be no other merit in such an arrangement, it is, at any rate, a reflex of the Roman character, as indeed exhibited in all their works, namely, straightforwardness.

To conclude, the allocations suggested in this paper are :—

<i>Petriana</i>	Lanercost
<i>Aballaba</i>	Brampton
<i>Congavata</i>	Castlesteads
<i>Axelodunum</i>	Stanwix
<i>Gabrosentis</i>	Burgh
<i>Tunnocellum</i>	Bowness
<i>Glannibanta</i>	Maryport
<i>Alionis</i>	Moresby
<i>Bremetenracum</i>	Papcastle
<i>Olenacum</i>	Old Carlisle
<i>Virosidum</i>	Whitbarrow

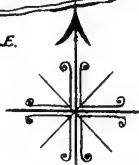


MAP

Showing the positions of the Skiddaw granite and associated Rocks, and the principal Mines in the Skiddaw group of Mountains. Drawn by

J. POSTLETHWAITE,
F. G. S.

SCALE:-
1 INCH TO A MILE.



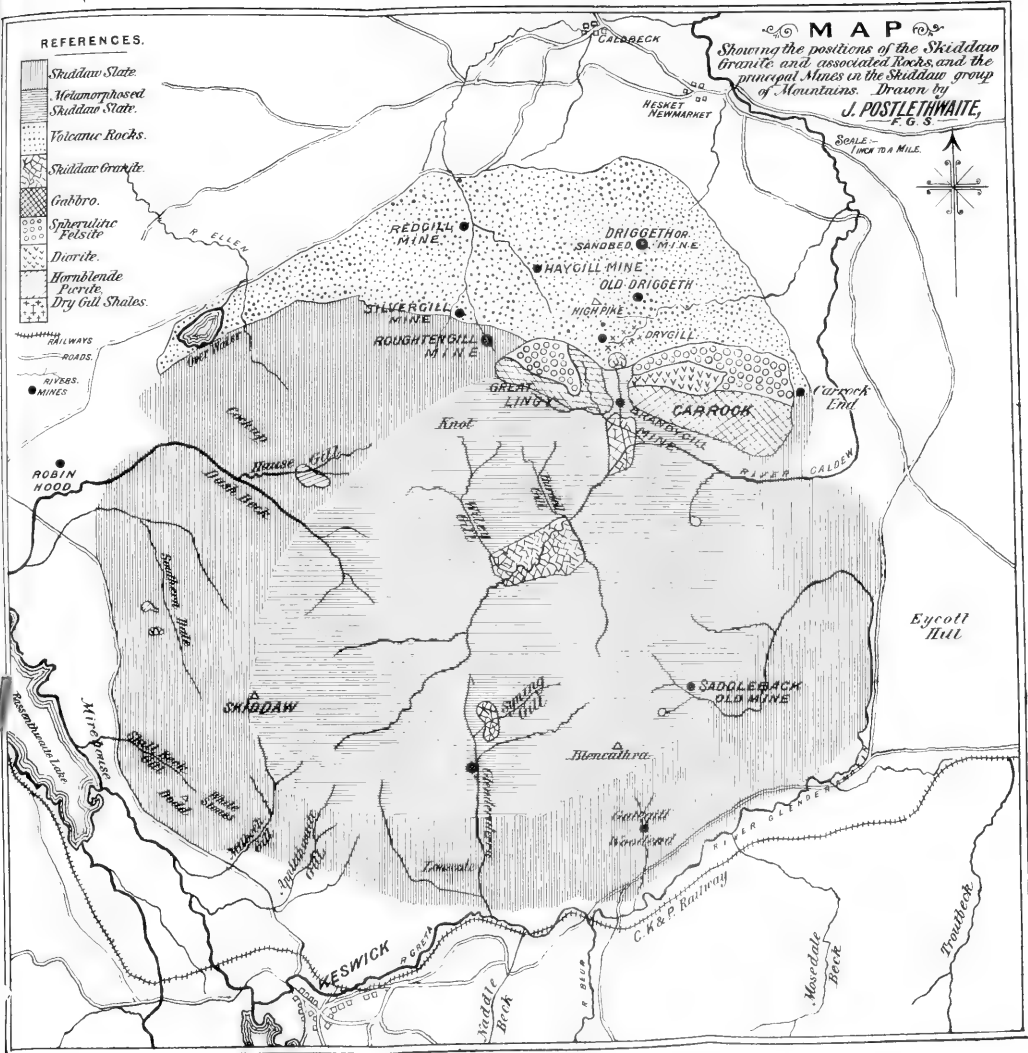
REFERENCES.

-  Skiddaw Slate
-  Metamorphosed Skiddaw Slate
-  Volcanic Rocks.
-  Skiddaw Granite.
-  Gabbro.
-  Spheralite
-  Felsite
-  Diorite.
-  Hornblende
-  Porphyry
-  Dry Gull Shales.
-  RAILWAYS
-  ROADS
-  RIVERS
-  MINES

MAP

Showing the positions of the Skiddaw granite and associated rocks, and the principal Mines in the Skiddaw group of Mountains. Drawn by J. POSTLETHWAITE, F.G.S.

SCALE 1 INCH TO A MILE.



THE DEPOSITS OF METALLIC
AND OTHER MINERALS SURROUNDING THE
SKIDDAW GRANITE.

By JOHN POSTLETHWAITE, F.G.S.

(Read at the Ambleside Annual Meeting.)

A TREATISE on the mineral deposits which surround the Skiddaw Granite, must necessarily deal with the whole of the area embraced in the Skiddaw group of mountains, comprising a surface of about eighty square miles, mostly mountain and moorland. The dominant rock of this area is Skiddaw Slate, but there is a broad belt of volcanic rock, of the Eycott Hill series, extending along the northern side of the area; also several intrusive masses and dykes of felsite, diorite, gabbro, and picrite, in addition to the granite, which occupies the central portion of the area. Very little of the granite is visible on the surface, a small patch being exposed in Syning Gill, between Skiddaw and Blencathra, a larger mass at the upper end of the Caldew valley, and a third a little lower down the course of the river. The largest exposure measures about a mile in length and half a mile in width, and the three no doubt form portions of one mass which extends over a large area at a moderate depth beneath the surface; its presence being indicated by the changes produced in the surrounding and overlying Skiddaw Slate. These changes have been described in detail elsewhere, therefore, it will be sufficient to state here that there are traces of metamorphism, in a higher or less degree, extending over

an area which measures about six miles from east to west, and five miles from north to south, being rather more than one-third of the area under consideration. Of the remaining two-thirds, on which the granite has not produced any change, there are portions which have been subjected to a considerable amount of lateral pressure, the slate being tilted, crumpled, and cleaved; indeed, the once horizontal beds may now be seen in a vertical position, or inclining at any angle between the vertical and the horizontal. In some places, however, there is no trace of cleavage, and the slate splits readily along the bedding planes.

The volcanic rocks on the northern margin of the Skiddaw group of mountains consist of ancient lavas and ashes which have undergone a considerable amount of alteration. The materials composing these ash beds and lava flows may have issued, either from the great vent near Keswick or from a subsidiary vent situated somewhere between Eycott Hill and High Pike, and the beds as they now exist probably represent the remains of a covering which once overspread the whole of the Skiddaw group, and may have extended some distance to the north and west of it. Near the eastern end of this belt of volcanic rock, and adjoining the Skiddaw Granite in the lower part of the Caldew valley, there are several intrusive masses of felsite, diorite, and gabbro. The felsite occupies a considerable area on the top of Carrock, and a somewhat smaller area on Great Lingy. It is a coarsely grained felsite, of a pale red or brownish-grey colour, with scattered greenish crystals which show a spherulitic structure. Between Brandy Gill and the summit of Carrock there is a mass of diorite composed chiefly of felspar and hornblende, highly crystalline, and rather coarse grained. At the north-western end of the diorite, near the head of Brandy Gill, there is a small exposure of granitic rock in which the crystallization is imperfectly developed. Below, and to the east of the spherulitic felsite on Great Lingy, and below the same rock on Carrock, there is an exposure of gabbro, the base of which consists of large crystals of opaque white felspar (plagioclase) and interstitial quartz, and through it are scattered crystals of dark olive-green diallage, a mineral very nearly allied to hypersthene,

also occasional grains of magnetite and apatite. This rock is generally coarsely crystalline, but sometimes fine grained.

The hornblende picrite of Little Knot is a coarsely crystalline rock of a dark olive-green colour. It is composed largely of hornblende; but it also contains small quantities of quartz, felspar, iron peroxide, epidote, apatite, and calcite. It forms an oblong mass, about six hundred yards in length, by forty yards in width, and extends from the ridge of Little Knot, at the northern end of Longside, down nearly to the bottom of Southern Dale. There is also a large mass of hornblende picrite of like nature exposed in Hause Gill, a tributary of Dash Beck, a little to the north of Dash Farm.

On the Dodd (Skiddaw) there are several dykes of Mica-trap. They consist chiefly of felspar and mica, with a little quartz and hornblende, also some calc spar in cavities. The felspar is generally much altered.

Two small masses of diorite, probably portions of dykes, are exposed at Threlkeld Mine, in Gategill, Blencathra, where they have been cut into by the stream at the bottom of the gill. A slender dyke of similar character occurs at Robin Hood Mine, Bassenthwaite; the latter is about half a mile in length, and from three to six feet in width.

The Skiddaw group of mountains is intersected by an important fault, which extends through the depression occupied by Windermere, Rydal and Grasmere Lakes, thence through Dunmail Pass and the Thirlmere Naddle and Glenderaterra Valleys. In Skiddaw Forest it appears to bifurcate, the eastern branch passing along the valley of the Caldew, and the western branch along the depression occupied by Dash Beck, thus dividing the Skiddaw group into three sections of nearly equal size. The mountain mass is also flanked on the south by the great fault which forms the boundary between the Skiddaw Slates and the volcanic rocks, and on the west by the fault which passes through the valley of the Derwent. The outer portion of the mountain area is much cut up on every side by mineral veins, of which there are two sets, one having a prevailing east-and-west, and the other a north-and-south bearing.

On the northern margin these veins have been very productive, and on the south-eastern margin scarcely less so; but those on the southern and western sides, although perhaps quite as numerous, have yielded very little ore. One of the latter—a copper vein—may be traced for a distance of four or five miles, and at one part of its course, called White Stones, on the south-western flank of Skiddaw, where several other veins intersect or diverge from it at various angles, an immense mass of quartz has been thrown out; indeed, so great is the quantity, that a mining engineer with whom I once visited the place, remarked that it appeared to be the home, or headquarters, of all the veins in the district.

The mineral deposits occurring in the Skiddaw group of mountains, and in the rocks and veins just described, are of very varied character; they contain many rare and beautiful varieties, more probably than are to be found in any area of equal size in the United Kingdom, or even in Europe. The deposits occur almost exclusively at the edges of the mountain area, and appear to be more closely associated with the intrusive masses and dykes of diorite, felsite, and gabbro, than with the granite itself; indeed, the central portion of the area has hitherto proved to be entirely barren. The prolific veins of the Caldbeck Fells area are in close proximity to the felsite, gabbro, and bastard granite on Carrock and Great Lingy, and the bearings of those that have yielded the largest quantities of ore are east and west, being nearly parallel to the longest axis of the intrusive masses of igneous rock. Owing to the position of these veins, lying as they do between the masses of igneous rock and the lower ground to the north, they must have received the drainage from the igneous rocks during the whole of the time that these rocks and veins have occupied their relative positions. Both the veins and igneous rocks probably owe their origin to the volcanic disturbances which took place during the Silurian period, and the early part of the Old Red Sandstone period. The opening of the fissures, now occupied by veins, no doubt gave rise to an upward flow and circulation of highly-heated water, charged with mineral matter of various kinds, which would be thrown down on the sides of the fissures when the temperature became sufficiently

reduced, either by approaching the surface or by mingling with colder currents. The deposits first formed were probably at a higher level than any part of the surface of the Lake District, as it now exists, and have since been removed by denudation, together with some thousands of feet of rock, consisting of Silurian and Carboniferous strata, which at one time probably extended over the whole district. The many valuable deposits of ore found on high mountains, prove that these deposits must have been formed when the surface was at a much higher level than it is now. Of these I may mention Greenside, Roughtengill, Threlkeld, Dale Head, Goldscope, Yewthwaite, and Old Brandley ; the first named being two thousand four hundred feet above the sea. At Old Brandley there was a valuable deposit of lead ore at the ridge of the mountain,—one thousand four hundred feet above the sea—and extending downwards to a depth of about thirty fathoms. Below that point there was no ore found worth naming, although several long levels were driven, and extensive explorations made.

Mr. J. Clifton Ward calculated from the size of the vacuities in the liquid cavities, of the quartz in the Skiddaw Granite, Eskdale Granite, Buttermere Syenite, St. John's Quartz Felsite, and other granitic and granitoid rock ; also in the vein quartz occurring in the central portion of the Lake District, that these rocks must have been formed, and the vein fissures filled, under a pressure equal to from twenty thousand to thirty thousand feet of rock. And further, that the water by which the quartz and other minerals were deposited must have been at a very high temperature. As the volcanic energy gradually decreased, the deposition of mineral matter would proceed to lower, and lower, levels ; and thus those portions of the vein fissures nearest the surface would be filled first, and the deep-seated portions more recently. The flow of thermal water was not confined to the vein fissures, but also accompanied the intrusive masses of igneous rock, and probably continued to find its way upwards, around the sides and through the joints of these rocks for a considerable time after they were solidified and partly cooled. Satisfactory proof of this has been obtained during the quarrying operations in the St. John's Quartz Felsite at

Threlkeld Quarry, several joints having been met with, the sides of which are coated with crystalline quartz, galena, and blende. Similar quarrying or mining operations in other masses of igneous rock would no doubt afford like evidence of thermal action.

In process of time the last trace of volcanic energy disappeared, the thermal waters ceased to flow, and the veins became conduits for the reception of surface drainage; then the water flowing in the opposite direction, that is downwards instead of upwards, would attack and dissolve some of the minerals previously deposited, and where circumstances were favourable, re-deposit them at lower levels in the same veins but under altered conditions, fresh combinations being formed by the addition of other minerals held in solution by the solvent fluid. This process has prevailed to a large extent in the veins of the Caldbeck Fells, decomposition products forming the largest proportion of the ores raised, while the sulphides of lead, copper, and zinc, were of secondary importance. This is no doubt due to the proximity of large masses of igneous rock on the side from which drainage would fall into the veins. The rain descending upon the igneous masses, having in its passage through the rock dissolved and carried away a certain amount of mineral matter, which on reaching the veins would unite with the minerals already deposited, or with those which were then being deposited there. It is to this combination of influences that the mines of the Caldbeck Fells are so justly famed for the great variety of rare and beautiful minerals which they yield, and of these, Roughtengill stands pre-eminent. It also stands foremost with regard to the richness of its deposits, which extend over a length of six hundred fathoms, yielding lead, copper, and zinc ores in workable quantities, and in a great variety of forms and colours, together with manganese and iron (limonite), also barytes and other non-metallic minerals.

Driggeth, or Sandbed Mine, ranks next to Roughtengill in importance. It too, has yielded lead and copper in considerable quantities, also some zinc ore and barytes. There was very little galena raised at Driggeth, almost the entire yield of lead ore consisting of decomposition products.

Silvergill, Hay Gill, Red Gill, Dry Gill, and Carrock End Mines, all situated in the Caldbeck Fells District, and more or less under the same conditions as Roughtengill and Driggeth, have yielded small quantities of lead and copper ores, chiefly decomposition products.

Brandy Gill can scarcely take rank as a mine, so little has been done in it, but its veins rank next to those of Roughtengill with regard to the number of rare and beautiful minerals which they contain. Their position between the masses of felsite and gabbro on Carrock and Great Lingy, on the eastern and western sides, with the bastard granite on the north, and the Skiddaw granite on the south, is peculiarly favourable for the production of these rare minerals.

On the southern side of the igneous rocks on Great Lingy, and within the area of metamorphosed Skiddaw Slate, surrounding the Skiddaw Granite, there are some veins of manganese. These may be seen in Burdell Gill, Wiley Gill, and at Knot. They seem to have been formed and filled under conditions totally different from those which were brought to bear upon the veins on the northern side of the igneous rocks, as there is in the former a total absence of that variety in their mineral contents, which is the most prominent feature in the latter, indeed there is only a little limonite, crystallized quartz and calcite associated with the manganese.

Leaving the Caldbeck Fells District, and journeying round to the south-east, the Blencathra veins and mines next claim our attention. Most of these veins are like the Caldbeck Fells veins, in being associated more or less with igneous rocks, but differ widely from them in other respects. The Woodend and Gategill veins are the most noteworthy of the group, and they have yielded, and are still yielding large quantities of lead and zinc ores, which have remained in the condition in which they were first deposited, no decomposition nor combination with other minerals having taken place. Formerly these veins were worked by separate mines, under their respective names, but they are now embraced in one, called Threlkeld Mine. The bearing of Woodend vein is about 10 degrees east of north, and of Gategill vein 25 degrees west of

north ; they form a junction in the northern part of the mine, and Gategill vein being the older, is displaced about 20 fathoms. These veins do not, like the principal veins in the Caldbeck Fells, skirt the mountains, and run parallel with the igneous rocks, but they pierce both the mountain and the dykes of igneous rock at right angles, and probably penetrate the Skiddaw Granite, although they cannot be traced into it on the surface. Both of the veins contain ore in fair workable quantities on each side of the junction, but the twenty fathoms of ground between the points where the Gategill vein joins the Woodend vein on the eastern, and leaves it on the western side, is the richest portion of the mine. The dykes of diorite which are older than the veins, were probably formed at the same time as the system of east and west faults, and the diorite was consolidated, although the flow of thermal water had probably not ceased when Gategill vein fissure was formed and gave fresh impetus to it. The thermal action having continued until Gategill vein was filled, a fresh disturbance took place, Woodend vein fissure was formed, and the thermal action again revived, and continued in operation until the new fissure was filled. Thus, the deposition of ore between the points of junction, would continue double the length of time that it was in operation in other portions of the veins, the junction being re-opened, and becoming part of Woodend vein, as it had previously been of Gategill vein.

A remarkable feature in these veins, is the small quantity of quartz associated with the ores, donk being a more prominent concomitant ; but they contain, in addition to the ores of lead and zinc, a great deal of iron pyrites, which is undergoing decomposition at a rapid rate, the water flowing from some parts of the mine being highly charged with oxide of iron in solution. A deposit of limonite formed by this mineralized water in the low level at Woodend (now Threlkeld) mine, is described in a paper on "Mineral Springs near Keswick."*

A decomposition similar to the one in progress at Threlkeld mine was completed long ago in some of the neighbouring veins. The large vein at Saddleback Old Mine, in the Glenderamakin

* Trans. Cumb. and West. Assoc., No. xi. p. 142.

Valley, is almost filled with limonite of a dark brown and orange colour ; indeed, it is so plentiful, that an attempt was made a few years ago to mine and send it to market as a pigment, but the cost of carriage rendered it impracticable. A considerable quantity of limonite also occurs in some of the veins in the Glenderaterra valley.

There are several important veins in the last named valley, and one of the number no doubt occupies the great fault fissure which has formed the line of weakness, along which the valley has been excavated. This vein bears some resemblance to the Caldbeck Fells veins with regard both to the number and character of the minerals it contains, consisting of the ores of lead, copper, zinc, and iron, together with large quantities of friable quartz, and a little barytes and chalcedony. Some of the ores are decomposition products. The mining operations on this vein are of a superficial character, and very little ore has been raised. A shaft was sunk on one portion of it to a depth of thirty fathoms, and levels were driven off north and south at fifteen fathoms below the surface, and two more at the bottom of the shaft, but not to any great distance ; and from these workings about one hundred tons of lead ore, and four or five tons of copper ore were raised. Some lead and copper ores were also obtained from a level about fifty fathoms north of this shaft. A little lower down the valley another shaft was sunk a few fathoms, and some ore was obtained from it. It appears that wherever these veins have been worked a little ore has been found, but hitherto they have not yielded sufficient to cover expenses. The whole of these works are either in the chialstolite slate, spotted schist, or mica schist adjoining the granite in Syning Gill, and it is much to be regretted that there is not sufficient ore to render the works profitable, and cause deeper and more extensive excavations to be made in these interesting metamorphic rocks ; which, no doubt, bear the same share in the formation of the decomposition products in the Glenderaterra veins as that borne by the igneous rocks in the Caldbeck Fells District.

Proceeding further to the west we come to the great vein of Skiddaw, which stretches from near Ravenstone to Lonscale, along

the lower part of the mountain. It occupies the very position, which, according to some authorities, should be most favourable for the deposition of minerals, but the most noteworthy feature connected with its mineral contents is extreme barrenness. It contains in some places abundance of quartz, with traces of copper throughout the greater part of its length, also here and there a little maganese and barytes. The reason for this barrenness is not very apparent, the presence of quartz shows that there has been a certain amount of thermal action throughout the entire length of the vein, while at White Stones it has been remarkable for its intensity, and must have continued a great length of time. There are no igneous rocks between the vein and the higher ground, but it is very nearly, if not quite, in touch with the chiastolite slate on that side, both in Millbeck and Applethwaite Gills. The Trap dykes on Dodd cannot influence the vein, as they are on the wrong side. Short levels have been driven on the vein in Sandy Gill, above Mirehouse, and in Applethwaite Gill, small pits have also been sunk at various points on the back of the vein, but they did not open out anything that would warrant more extensive explorations.

Some of the veins which join the Skiddaw vein at White Stones contain immense quantities of quartz, and one of them, in which a mine was opened a few years ago, yielded about one hundred and fifty tons of sulphate barytes, also some fine lumps of galena embedded in the barytes.

The strongest of the veins which unite with the Skiddaw vein at White Stones, is one that takes a north-westerly course down Skill Beck Gill, to near Mirehouse, where it disappears beneath the thick alluvial soil. It contains abundance of quartz, and some galena; and a level has been driven on it, just above the road, near Mirehouse, but it does not appear to have yielded much ore. There are also lead veins on Cockup, in Dead Beck and Dash Beck Gills, and extensive excavations have been made in some of them, but they have not been remunerative.

At Robin Hood there is a vein closely associated with the slender dyke of diorite at that place. It runs parallel with and close to

the dyke, and contains a considerable quantity of white opaque quartz, in some of which may be detected small specks and flakes of antimony. A shaft was sunk a few fathoms at the point where antimony was first found, and afterwards a level was driven on the vein for the purpose of unwatering the shaft. About twenty tons of oxide of antimony were obtained, chiefly in the shaft, but it is doubtful whether the quantity raised was sufficient to cover expenses. There are now few traces of the work done in this mine, the upper part of the shaft has been covered over and filled in, the mouth of the level walled up, and all the material brought out of both shaft and level has been removed and used for road repairs.

Thus, we find that all the veins on the southern and western sides of the Skiddaw group of mountains are practically barren. They have been proved to be lacking in workable deposits of ore like those at Threlkeld and some of the Caldbeck Fells mines; and, with the exception of the antimony at Robin Hood, there is an almost entire absence of those rare minerals for which the Caldbeck Fells mines are so famed.

There is nothing in the position and surroundings of the veins and mineral deposits of the Skiddaw group that would tend to reveal the laws which govern the deposition of minerals, or afford any evidence that would be of service in guiding miners in their search for metalliferous ores, either here or elsewhere. We may learn something of the laws which regulate the decomposition and changes which take place in minerals already deposited, but those which governed the original deposition are still wrapped in obscurity. In the Caldbeck Fells District the best ore-bearing veins run parallel to the axis of the higher ground, and in a position which causes them to receive the drainage from the higher ground; while in the Blencathra mines the best deposits are found in veins which penetrate the mountain at right angles. On the other hand, the Skiddaw vein, which occupies the same position on the south as that occupied by the best Caldbeck Fells veins on the north,

contains little more than a trace of ore : the same may also be said of a vein at White Stones, which occupies the same relative position as the most fruitful of the Blencathra veins. We may, therefore, safely infer that the surface configuration of the ground did not in any way influence the original deposition of the ores, but that it did, to a considerable extent, influence the formation of secondary, or decomposition products.

SOME OF THE CHANGES OF SOCIAL LIFE
IN ENGLAND DURING THE LAST SIXTY YEARS.

*The Presidential Address given at the Annual Meeting of the
Association at Ambleside, July, 1890,*

BY THE RIGHT REV. THE BISHOP OF BARROW-IN-FURNESS.

It is my duty as filling the honorable office of President of this Association for the present year, to give a short address to you at your annual meeting. We are finishing this year one of the decades of the 19th century—only ten years more remain to it. And the fact reminds me that if I live to see the end of the present century, I shall have reached the threescore years and ten, which are the ordinary limit of human life. As we grow older, anniversaries are perhaps not such pleasant things as they were when we were young. We are more ready to look back to our own youth, and to think pensively of the times that are gone, than to look forward hopefully to the future. And so, my duty of giving an address to you to-day has set me thinking of the many and great changes that have passed over England since my own birth, just sixty years ago, and of the very different state of things which surrounded me in my own childhood, and in the days of my earliest recollections.

It is one of the privileges of advancing years to prose about the memories of youth. And at the risk of being egotistical, I should like to talk to you about some of those things, and (so far as can be done in a brief sketch) to compare the England of fifty or sixty

years ago with the England of to-day. I shall not touch upon anything ecclesiastical or political, though much might be said under both of those heads.

It seems to me almost as if I had been born into a different world from that in which we live now. The nation had then recovered itself from the great strain of the long European war, in which England had (at one time almost alone against combined Europe) withstood the power of the first Napoleon. During that war, every other thought had been thrown into the background: taxation was at the highest possible point, and most people lived very simply and frugally. I have heard my father say that, as soon as the peace came, there was at once a very marked change, in the growth of comparative luxury in every rank and class of society. And soon the nation woke up to that great outburst of activity—social, scientific, intellectual, industrial—which has lasted to our own day.

I have lately read over again two books which embody in the form of fiction accounts of the life and manners of the times to which they relate. One is Charles Reade's novel, "The Cloister and the Hearth." It gives many excellent sketches of life and manners on the continent of Europe, as they were about four hundred years ago—not entirely drawn from the writer's imagination, but founded largely upon a contemporary book, the *Colloquies of Erasmus*. The other is a work familiar (I hope) to you all, for there is no book better worthy of study, as giving a good idea of the England of fifty or sixty years ago. The "Pickwick Papers" were completed in 1837, and I well remember spelling out the green covered monthly numbers which my big brothers left about in my nursery (though of course I understood them very imperfectly), and the fascination which the pictures exercised upon my childish mind. And you know every Naturalist Society of the present day ought to look back with respect to the Pickwick Club, as being in some sense its forerunner! It was Mr. Pickwick's essay on the Natural History of the Sticklebacks in Hampstead Ponds which had established his greatness. What a curious change it marks in the manner in which the two gener-

ations regard natural history! In 1836, to study Sticklebacks seemed ludicrous! What an interesting account has been given of them by a well-known naturalist within the last few years, of the nests which they make, and of their habits of life generally! How much more have we learnt to watch and love the minutest details of God's works in Nature!

Reading over again those two books, "The Cloister and the Hearth," and the "Pickwick Papers," it seems to me that (except for the great religious change of the Reformation) the world of 1830 was more *like* the world of 1490 than of 1890, and that the last sixty years have wrought greater changes than the three centuries which went before: certainly no period of sixty years in the whole history of the world has seen so many.

Take first this great fact, that railways have been practically the growth of the last sixty years. The small line from Stockton to Darlington began (I believe) about 1825; but the railway from Liverpool to Manchester was first opened in September, 1830, and at that time the communication between the north and south of England was still by the old stage coaches, travelling seven or eight miles an hour. These, of course, were chiefly for the wealthier classes, who wished to travel fast and could afford the expense. If the poor travelled at all, they went in wagons, and a journey which is now performed in a day, would take them two or three weeks. I well remember the weary length of a journey from London into Suffolk in the stuffy inside of a stage coach. And among the pleasanter memories of my childhood are the long drives from London to Brighton, or some other seaside place, or to a house in the country, sleeping at an inn on the road. It is difficult now to realize that, within the memory of some of us, Cumberland was practically farther from London than Rome or Madrid are now. I suppose, if I had been told then that my own later years were to be passed in Cumberland, it would have seemed to me a greater banishment than it does now to your own children if they have to go out and settle in Canada. And this tendency to draw together the different parts of the world seems to be increasing. How strange would have appeared, even twenty years

ago, the practice by which so many persons who happen to have sufficient wealth or leisure go habitually to the south of France or to some other warm climate, to avoid the cold of an English winter! Certainly the various nations of Europe are more closely bound together in commerce, and have more intercourse with each other than the north and south, east and west of England had, only sixty years since!

I might go on to speak of smaller changes, yet changes which would strike us very forcibly, if they came suddenly. For instance, imagine London, as it was sixty years ago, without a cab or an omnibus! or think that in those days there were no policemen, only the old watchmen. One wonders how in the world order was preserved, or crime checked! Or compare Mrs. Gamp with the modern trained nurse—a sufficiently startling contrast!

But I pass on to the social state of England in other respects. I have already said that I know no more instructive reading, more especially as regards the state and habits of the middle classes fifty or sixty years ago, than the earlier works of Charles Dickens. Take for instance the description in the “Pickwick Papers” of the life of the well-to-do Kentish yeoman, at Dingley Dell, a personage who (I fear) has nearly vanished out of the land during the last fifty years. One of the few changes which I very greatly regret, is the decay of purely rural life—the yeomen and statesmen now well nigh extinct—the farmers in many districts more or less impoverished—while the agricultural labourers are indeed more educated and better off, but are changed in character and far less numerous. I confess to a regret for the loss of the smock-frocked labourers of my boyhood. For it seems to me that the village folk, ignorant perhaps and prejudiced, but kindly, simple, hardy, healthy, and the most numerous class of the community, were the backbone of England.

Or, to turn to changes which are very markedly for the *better*. Throughout the book to which I have been referring, you will see on almost every page some evidence of the general drinking habits of the nation, for instance the large consumption of brandy and water at all times and on every possible excuse. Drunkenness

(and that in the case of personages whom we are meant to like and rather to respect) is represented as frequent, and as no cause for shame. And my own remembrance of school and college life entirely corresponds to this. The habitual or confirmed drunkard, of course, is not often found among the young. But we were all from childhood accustomed to the free use of stimulants. The young schoolboy at a boarding school had his beer at dinner as a matter of course; little boys and girls coming down to dessert after dinner to see their parents' guests, were supplied with their half-glass of wine. In my undergraduate days the tankard of ale was habitually passed round after every breakfast party, and nearly every one drank some. I suppose my statement will astonish some of the younger total abstainers here (for no doubt there are some such present); but it is a simple fact, that up to the time when I came to be vicar of Kirkby Lonsdale in 1862, I had in my whole life (so far as I can now recal to my memory) only known personally *one* total abstainer! Now of course I do not for a moment wish to imply that total abstainers are the only people interested in true temperance (in fact I am not one myself) but I do think that all these things point to a very extraordinary change of the general sentiment in such matters.

Again, what *some* boarding schools (at all events) were like, we may read in the pages of "Nicholas Nickleby." It may be hoped and believed that few schools were altogether like that conducted by Mr. Squeers. But let me remind you that Dickens did habitually draw from life. He saw the grotesque side of things, but he wrote what he saw: and almost always with the distinct purpose of abating evils which he knew to exist. And I have to-night with me a curious illustration of the fact, which I can show to any one interested in it. It is the original advertisement of Mr. Squeers' academy, cut out from the *Times* by a relative of my own, at the time when "Nicholas Nickleby" was being published. And I do not envy the feelings of the prototype of Mr. Squeers, if he bought that green covered number to beguile the tedium of the long stage coach journey from the George and Blue Boar, Holborn, to the

north. I will just read it. Those of you who know "Nicholas Nickleby" well, will recognise it at once, as almost word for word the advertisement of Mr. Squeers. I omit the names.

"EDUCATION.—By Mr. ———, at ——— Academy, near Barnard Castle, Durham, youth are carefully instructed in the English, Latin, and Greek languages, writing, common and decimal arithmetic, book-keeping, mensuration, surveying, geometry, geography, and navigation, with the most useful branches of the mathematics, and provided with board, clothes, and every necessary, at 20 guineas per annum each. No extra charges. No vacations. Further particulars may be known on application to Mr. ———, agent, — Great Marylebone Street. Mr. ——— attends at the George and Blue Boar, Holborn, from 12 to 2, daily."

I must turn now to a more important change still. I mean the change in the social condition of the poor. But as to this, I must have recourse to the memory and the writings of others; for naturally a child or a little schoolboy (as I was then) would not concern himself greatly with such matters. Thus, I do not remember to have heard much, at the time, of the sufferings of the children employed in mines, or of the efforts made for their relief by Lord Shaftesbury, to whom chiefly the nation owes its deliverance from that crying sin. But I have a vivid recollection of the chimney sweeps of those days—boys, sometimes stolen for the purpose as children*—more often sold by their parents; and driven by their masters to climb up chimneys; beaten if they would not or could not go up—fires lighted underneath to smoke them out, if they would not come down again—backs and elbows and knees bruised and torn by the bricks in climbing—half-starved—left unwashed, though the neglect of this in their occupation brought on a dreadful disease. And yet, whatever philanthropists might say, it was impossible to persuade people to have their chimneys swept by machines. Happily after a time the employment of these boys was forbidden by law.

As to the state of the pauper, or the criminal class, let me once

* I knew very well in later years an old man who had been so stolen, and who was I believe the original of the Sweep in Charles Kingsley's "Waterbaby."

more refer to the writings of Charles Dickens. Read "Oliver Twist," published (I think) about 1833; and see how utterly impossible it would be for such a book to be written in the present day. Of course it is (more or less) a caricature of the state of things which Dickens saw around him. But a caricature loses all its point, if it does not possess some sort of real likeness to the life. And (as I have said) in almost all his writings Dickens had some serious moral purpose. Those purposes have, for the most part, been now so completely achieved, that the old evil state of affairs is forgotten, and we are apt to say that such things can never have been! Compare our workhouses and our workhouse schools with the description presented in "Oliver Twist." Look at the picture of the utterly neglected London poor, and especially of the criminal classes, there given, cut off wholly from any hope of better things; and think of the swarm of charitable and religious agencies which are at work now—inadequate indeed still to cope with the needs of the case, and yet presenting a very different aspect from that given in "Oliver Twist," and resulting in an immense diminution of crime and misery.

But the honest and respectable working man—what was his condition? With regard to his wages, let me refer to a very remarkable pamphlet, published in 1884, by Mr. Robert Giffen, President of the Statistical Society, on "The Progress of the Working Classes in the last Half Century," which gives a more trustworthy account of the change than any mere impressions could do.* The conclusion to which Mr. Giffen comes is shortly this—that in fifty years the workman's wages have risen between 50 and 100 per cent.—that his food, and all articles consumed by him, are on the whole somewhat cheaper, bread in particular being much cheaper and freed from the great fluctuations of price

* I may also mention an interesting lecture by Mr. C. S. Roundell, on "The Progress of the Working Classes during the Reign of the present Queen," to which I owe several thoughts for this address.

which in old times caused occasionally severe distress. Butcher's meat is dearer, but then fifty or sixty years ago it was not ordinarily consumed by the labouring classes at all—it was quite beyond their reach. House rent also is higher; but the houses are much better, so that this increase chiefly represents the interest upon the increased capital invested in building. And with all this, the workman's hours of labour have been diminished about 20 per cent., and are still diminishing.

Fifty or sixty years ago, certainly less than half of the labouring classes could read and write. Of course the memory of many of us here can testify to a great and continuous improvement in this respect. No doubt it was more needed in the south of England than here in the north, where there was a larger number of old endowed schools. In fact, as regards the N.W. of England, I doubt whether the changes of modern legislation (such as the new schemes promoted by the Endowed Schools Commission and the throwing open of so many local scholarships at the Universities,) may not have made it rather *more* difficult for the poor man's clever son to rise in the world than it was then.

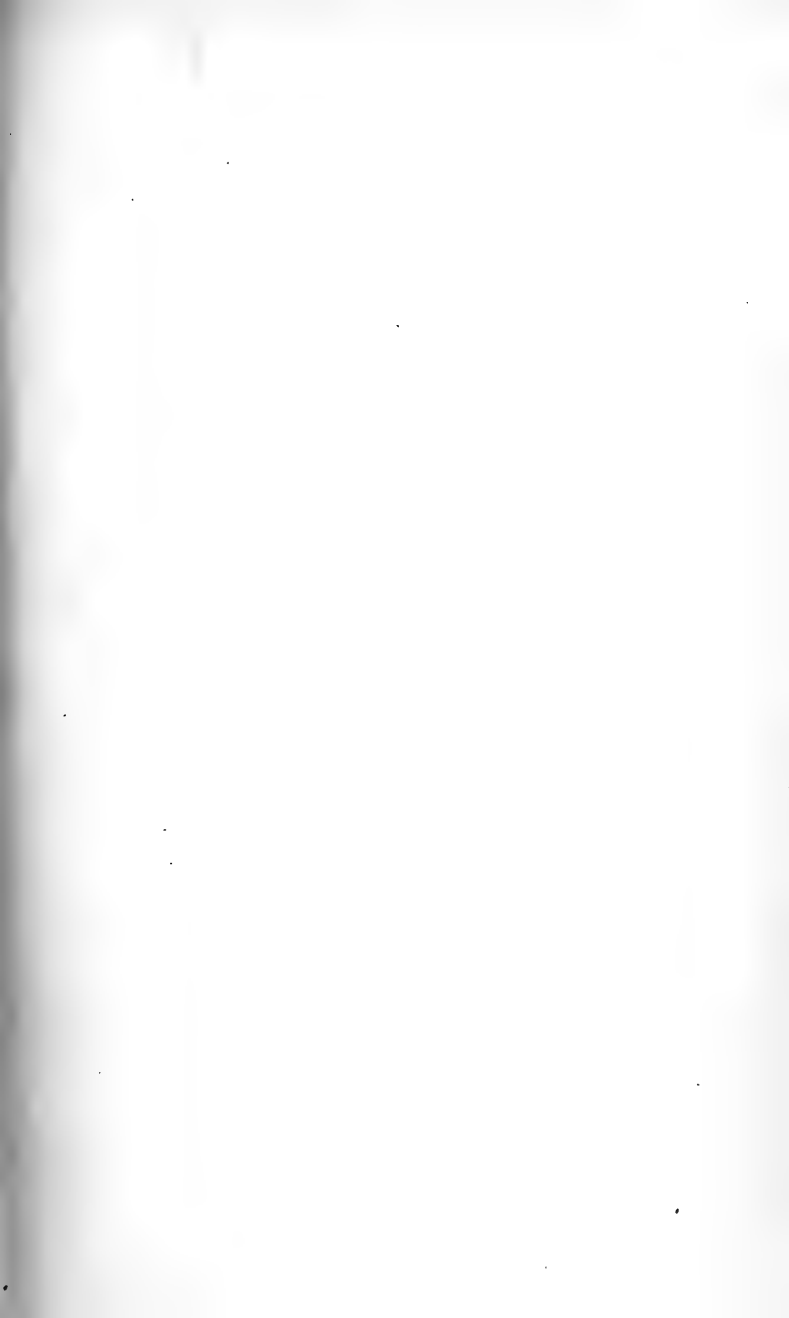
But, speaking broadly, the working man is better fed, better housed, better clothed, better educated, his working hours are shorter, he puts more money into savings banks, he has better literature, better amusements, he goes about more, he is better mannered, he has a larger share in the comforts and even the luxuries of civilized life. And one result is shown by this fact—that, according to the life tables, there has been in about forty years, a distinct gain in the average duration of life—two years in the case of males, three-and-a-half years in the case of females. Think how much more health and strength this represents—what a diminution of sickness and sorrow in the world!

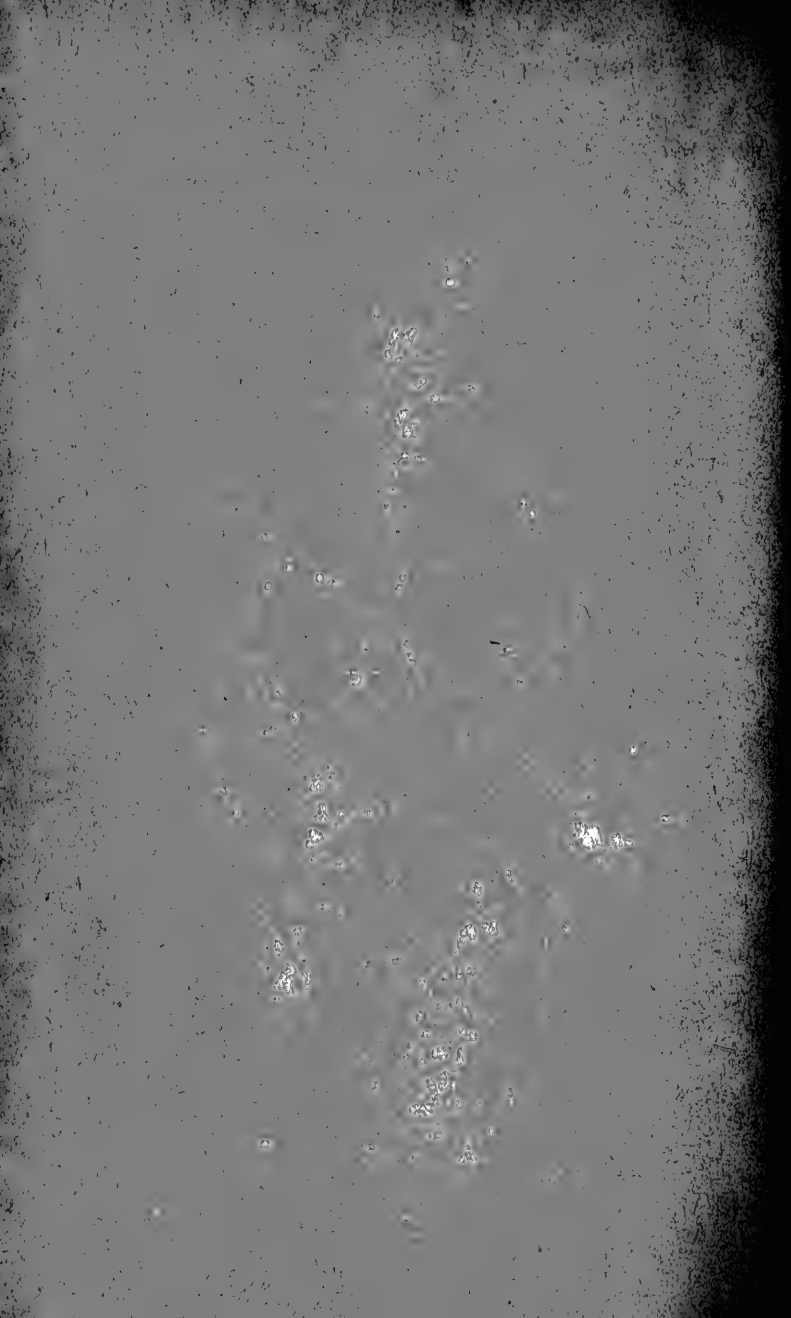
Yes, "the good old times," which we so often talk of, owe their existence far more to the affection with which we look back on the past as we advance in life, than to any real superiority which

they possessed in themselves. And the words of the Preacher, Ecclesiastes, are true still, "Say not thou, What is the cause that the former times were better than these? for thou dost not inquire wisely concerning this." Much, as we know, still remains to be done—much for our own moral and spiritual progress and for the good of those around us. But I am convinced that England is now a better country to live in, and that (as a whole) Englishmen are happier, and I hope better, to-day, than they were fifty or sixty years ago.

8 JUN. 92







TRANSACTIONS

OF THE

Cumberland and Westmorland Association

FOR THE

Advancement of Literature and Science.

No. XVI.—1890-91.

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.

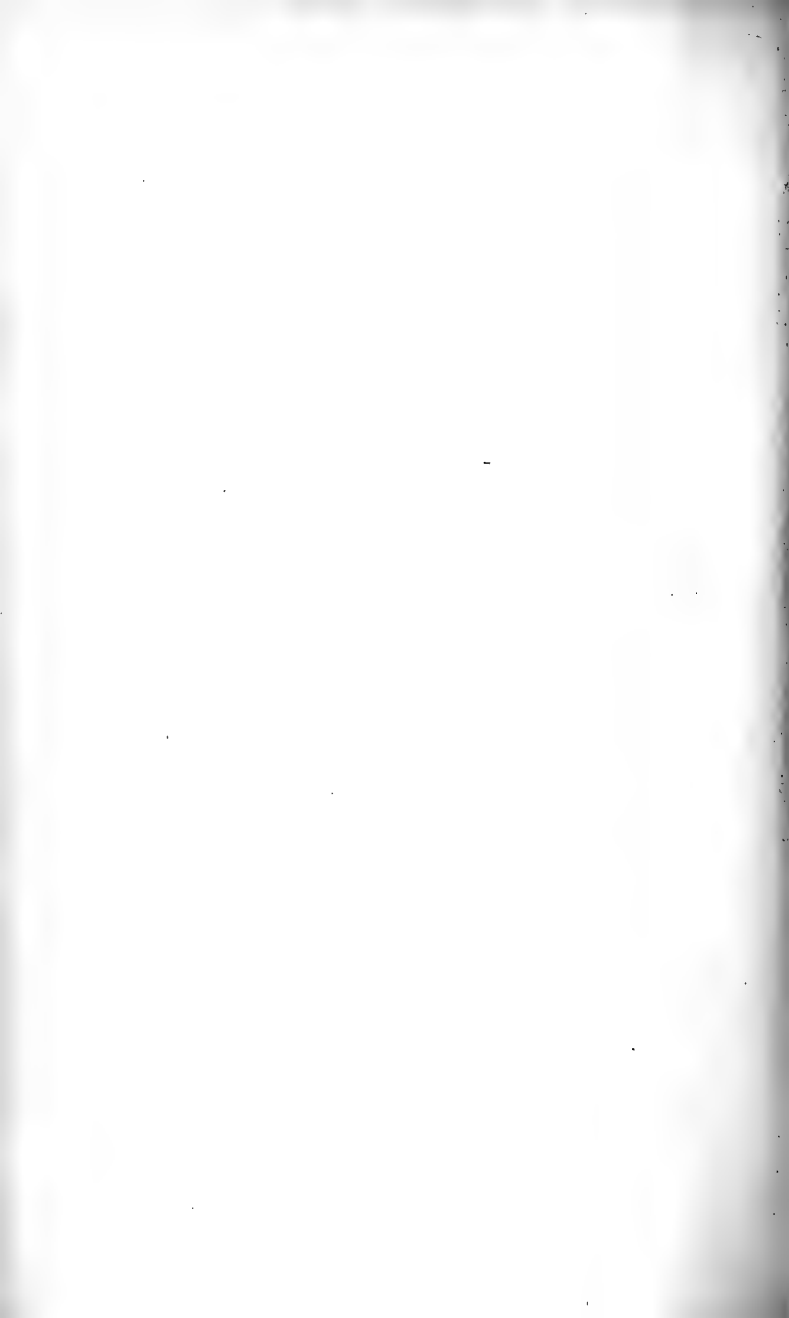
NON-MEMBERS, TWO SHILLINGS AND SIXPENCE.



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CONTENTS.

	Page
RULES	v.
LIST OF OFFICERS	viii.
ADDRESSES OF HONORARY SECRETARIES OF THE SEVERAL LOCAL SOCIETIES	ix.
LOCAL SUB-COMMITTEES	x.
MEMORANDA FOR MEMBERS	xi.
LIST OF ASSOCIATION MEMBERS	xii.
REPORTS FROM THE ASSOCIATED SOCIETIES	xiii.
REPORT OF ASSOCIATION SECRETARY	xxiv.
TREASURER'S ACCOUNT	xxix.
CATALOGUE OF ASSOCIATION LIBRARY	xxx.
PRESIDENT'S ADDRESS: "On the Study of Local Archæology." By the Right Rev. The BISHOP OF BARROW-IN-FURNESS ...	1
PAPERS READ AT THE ANNUAL MEETING:—	
"The Cleaved Ashes and Breccias of the Volcanic Series of Borrowdale." By J. POSTLETHWAITE, F.G.S. ...	41
"Notes on some of the Limestones of Cumberland and Westmorland." By J. G. GOODCHILD, H.M. Geol. Survey, F.G.S., &c. ...	125
PAPERS COMMUNICATED TO THE SOCIETIES, AND SELECTED BY THE ASSOCIATION COUNCIL FOR PUBLICATION:—	
"A Roman Recreation Ground: The Campus Martius of Glanoventa." By the Rev. J. I. CUMMINS, O.S.B. (Maryport)...	13
"Botanical 'Waifs' in Cumberland." By WILLIAM HODGSON, A.L.S. (Maryport and Carlisle) ...	23
"Notabilia of Old Penrith." Part II. By GEORGE WATSON. (Penrith) ...	55
"Mr. W. Kinsey Dover, F.G.S." By J. POSTLETHWAITE, F.G.S.	93
"The Story of Gough and his Dog." By the Rev. H. D. RAWNSLEY, M.A. ...	95
"Additional Notes on the Land and Fresh Water Shells of Cumberland and Westmorland." By C. W. SMITH ...	139



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. Such members shall be termed “Association Members.”

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, Two Secretaries, an Editor, a Librarian, and of ordinary members, two to be elected by each affiliated Society. The President, Secretaries, Editor, and Librarian shall be elected annually at the Annual Meeting, and shall be capable of re-election. The Recorders shall be ex-officio members of the Council.

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.—Association Members pay the sum of 6/- annually, or they may compound for their subscription for life by a payment of £3 3s. od. in one sum.

12.—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.

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

14.—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 SEVENTEENTH ANNUAL MEETING will be held in the Summer of 1892, and due notice of the place of Meeting and of the arrangements will be sent direct 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 Secretaries, J. B. BAILEY, Esq., Eaglesfield Street, Maryport ; or H. L. BARKER, Esq., Sunnyside, Silloth.

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Association Members	January 1st.
For Transactions	February 1st.
Lecturer's Fee	February 1st.
Capitation Fee	April 1st.

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N.B.—Rev. H. A. MACPHERSON, and W. HODGSON, Esq., will gladly answer any questions through the post that Members may wish to ask, with regard to any difficulty they may meet with in their reading on Zoological and Botanical matters respectively.

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Reports from the Associated Societies.

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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.

1890.

- Oct. 20—PRESIDENT'S ADDRESS.
 Oct. 27—R. HELLON, Esq.—“The Chemistry of Photography.”
 Nov. 24—T. CARRICK, Esq.—“Our Forefathers.” Limelight illustrations,
 and coins and implements exhibited.
 Dec. 8—Rev. H. WHITEHEAD, M.A.—“Parish Registers.”

1891.

- Jan. 19—Rev. R. M. MC. CLUMPHA.—“The Tyranny of Fashion.”
 Feb. 2—THOMAS SMITH, Esq.—“Thomas Hood.”
 Feb. 16—LEICESTER COLLIER, Esq.—“Venice and the Lagoon Islands.”
 Mar. 16—Rev. G. CREWDSON—“The Coniston Series of Rocks.”
 Mar. 30—Rev. S. R. CROCKETT—“Siberia.”
 Apr. 6—ANNUAL MEETING.

LECTURES.

1890.

- Nov. 3—Miss H. M. WOOLLEY—“Shakspeare’s Philosophy of Joy and Pain”
 Nov. 17—Rev. J. N. HOARE, M.A.—“Astronomy.”
 Dec. 1—Rev. ARTHUR MALE—“Through the Wild Kyber Pass.”
 Thrilling experiences among the Soldiers and Sepoys in the Afghan War.
 Dec. 15—Rev. H. D. RAWNSLEY, M.A.—“The Inhabitants of the Bass Rock, past and present.”

1891.

Course of Six University Extension Lectures, by Rev. W. HUDSON SHAW, M.A. :—

- Jan. 12—“The Early History of Florence.”
 Jan. 26—“Dante.”
 Feb. 9—“The Golden Age of Florence.”
 Feb. 23—“The Medici and the Renaissance.”
 Mar. 9—“Savonarola.”
 Mar. 23—“The Fall of the Republic.” “Machiavelli—Michelangelo.”

COMMITTEE’S REPORT.—Your Committee have pleasure in reporting that the interest taken in the work of the Society, both by members and by the public, has not suffered any diminution during the past Session. The attendance at ordinary meetings and lectures has been much the same as in former years, while there has been a slight increase in the numbers attending the University Extension Course. The programme consisted of eleven ordinary meetings and ten public lectures, including the University Extension Course. All engagements were met, with one exception, and on that occasion Mr. J. F. Curwen, of Kendal, kindly filled up the vacancy.

Application has been made to the County Council for a grant in aid of the educational work done by the Society.

In the early part of the Session an effort was made to organize a summer programme, jointly with the Trustees and Curators of the Museum, and thus promote among the members of the Society and others, a taste for the study of Natural Science. One long day excursion and a series of short half-day excursions were arranged for the purpose of studying and collecting specimens representing the Geology, Botany, and Entomology of the district, but the effort was not successful.

The number of members now on the books is one hundred and fifty-five, as compared with one hundred and ninety-two recorded at the end of last Session.

THE MUSEUM.—The Curators have to report that during the past year 1,041 visitors paid for admission to the Museum. Amongst those who visited the Museum last summer were Professor Hughes, of Cambridge, and thirty of his students.

Owing to the defective structure of the cases in which the Entomological portion of the collection was placed, the colours of many of the specimens were almost destroyed, but Mr. Bedale came forward and offered, not only to prepare new and suitable cases, from which the light should be excluded, but also to replace the damaged specimens and add a number that had not previously been in the collection.

Three specimens of wild Water-fowl have been added to the Ornithological section of the collection since last Annual Meeting; also a primitive Theodolite, a Barometer, and a Blow Pipe.

MARYPORT LITERARY AND SCIENTIFIC SOCIETY.

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The following MEETINGS were held during the Session :—

1890.

- Nov. 4—CONVERSAZIONE. Addresses by the President and Vice-President.
 Nov. 11—J. CRUM, Esq.—“Michael Faraday,” with experiments.
 Nov. 25—R. J. BAILLIE, Esq., F.R.A.S.—“The Poetry of Lord Tennyson.”
 Dec. 9—Rev. F. H. J. MC.CORMICK, F.S.A. (Scot.)—“Folk Lore.”

1891.

- Jan. 13—CONVERSAZIONE and EXHIBITION.
 Jan. 20—J. ARTHUR THOMSON, M.A. (Association Lecturer)—“Shifts for a Living among Animals.”
 Feb. 3—W. HODGSON, Esq., A.L.S.—“Stray Plants recently gathered at Workington, Maryport, and Silloth.”
 Feb. 17—Rev. A. SUTTON—“From Cairo to Khartoum.”
 Mar. 17—Rev. H. WHITEHEAD—“Parish Registers.”
 Mar. 31—Rev. G. PATTERSON—“Ruskin’s Views of Political and Social Science and of Art.”

CARLISLE SCIENTIFIC SOCIETY AND FIELD
NATURALISTS' CLUB.

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The following MEETINGS were held during the Session :—

1890.
Nov. 3—INAUGURAL ADDRESS by the President, J. A. WHEATLEY, Esq.—
“Technical Education.”
Nov. 17—Mr. TOM DUCKWORTH—“A Country Ramble.”
Dec. 1—Mr. R. J. BAILLIE, F.R.A. Soc.—“Light, the Eye, and the
Telescope.”
Dec. 15—Rev. H. WHITEHEAD—“Parish Registers” (continued).

1891.

- Jan. 12—Dr. CARLYLE—"Fungi," with illustrations and specimens.
 Jan. 19—J. A. THOMPSON, Esq., Assoc. Lecturer, and Lecturer on Zoology
 in the School of Medicine, Edinburgh—"Shifts for a Living
 among Animals."
 Feb. 9—R. A. ALLISON, Esq., M.P.—"Sir Walter Scott."
 Feb. 23—Mr. WILLIAM HODGSON, A.L.S., Workington—"Cumberland
 Botany—Waifs on the West Coast."
 Mar. 2—Rev. H. A. MACPHERSON—"Humming Birds."
 Mar. 9—Mr. H. L. WHEATLEY—"Rio de Janeiro—some Personal
 Experiences of Brazil."
 Mar. 23—Rev. H. A. MACPHERSON—"Birds of China."
 Apr. 6—Mr. JOHN HOLLIDAY—"A Gas Jet," with experiments.
 Apr. 20—Mr. JOHN SINCLAIR—"Musgrave Lewthwaite Watson—
 Cumberland Worthy."

AMBLESIDE AND DISTRICT LITERARY AND
 SCIENTIFIC SOCIETY.

14TH SESSION, 1890-91.

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The following MEETINGS were held during the Session:—

1890.

- Oct. 28—Rev. H. D. RAWNSLEY, M.A.—“Some more Royal Mummies.”
 Nov. 11—Rev. JOHN TAYLOR, M.A.—“Erasmus.”
 Nov. 25—Rev. R. VAUGHAN—“Sleep and Dreams”
 Dec. 9—Miss WAKEFIELD—“English Melodies from 13th to 19th
 Century.” Illustrations sung.

1891.

- Jan. 21—J. A. THOMSON, M.A., Lecturer on Zoology, School of Medicine,
 Edinburgh—“Some Shifts among Animals for a Living.”
 Feb. 3—Rev. G. CREWDSON, M.A.—“Some Peculiarities of Insect Life.”
 Feb. 17—Col. CARGILL—“The Border Regiment.”
 Mar. 3—Rev. L. OWEN LEWIS, M.A.—“Some Phases of Plant Life.”
 Mar. 17—Rev. C. H. CHASE, M.A.—“The Catacombs.”

SILLOTH AND HOLME CULTRAM LITERARY
 AND SCIENTIFIC SOCIETY.

12TH SESSION, 1890-91.

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

1890.

- Oct. 24—CONVERSAZIONE. President's Address, Selections of Music, &c.
 Nov. 7—Rev. W. SHERWEN, M.A., Dean—"War as it is." Illustrated with Lantern Slides.
 Nov. 21—J. B. BAILEY, Esq., Maryport—"The Order of St. John of Jerusalem and the Knights Templars."
 Dec. 5—Rev. A. SUTTON, M.A., Bridekirk—"Cairo to Khartoum."
 Dec. 19—Rev. F. H. J. MC.CORMICK, F.S.A., Whitehaven—"Folk Lore."
 1891.
 Jan. 9—Rev. G. E. GILBANKS, M.A., Abbey Town—"A Trip to the West Indies." Illustrated with Lantern Slides.
 Jan. 23—J. ARTHUR THOMSON, M.A., Edinburgh, Lecturer on Zoology in the School of Medicine—"Domestic Life of Animals."
 Feb. 5—Mr. GEORGE DAWSON, Carlisle—"Butterflies of Cumberland."
 Feb. 20—Rev. S. FALLE, M.A., Brampton—"Epitaphs."
 Mar. 6—Rev. J. H. RIDDETTE, Liverpool—"The Transvaal." Illustrated with Lantern Slides.
 Mar. 20—Rev. W. P. INGLEDOW, Millom.

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

1890.

- Sept. 30—Mr. W. WILSON—"Former Social Life in Cumberland and Westmorland."
 Oct. 14—Dr. THOMPSON—"Central Africa." Illustrated with Limelight Lantern.
 Oct. 28—Rev A. SUTTON—"Cairo to Khartoum."
 Nov. 11—Mr. HUGILL—"British Policy in Africa."
 Nov. 25—Mr. J. A. WHEATLEY—"Gems and Precious Stones."
 Dec. 9—Rev. H. A. MACPHERSON—"Birds."

1891.

- Jan. 20—Rev. C. H. PAREZ—"The Floor of the Ocean."
 Jan. 27—Mr. J. A. THOMPSON, M.A., Lecturer on Zoology, School of Medicine, Edinburgh—"Shifts for a Living among Animals."
 Feb. 10—Mr. E. WESTMORLAND—"Phrenology."
 Feb. 24—Rev. H. J. BULKELEY—"Eminent Persons who died in 1890."
 Mar. 10—MEMBERS—"Reading of Sheridan's *School for Scandal*."
 Mar. 24—Rev. J. S. OSTLE—"Charles Stuart Calverley."

PENRITH AND DISTRICT LITERARY AND SCIENTIFIC SOCIETY.

10TH SESSION, 1890-91.

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The following *LECTURES* were given during the Session :—

1890.

- Oct. 9—CONVERSAZIONE and Meeting of the Society.
 Oct. 23—Miss H. M. WOOLLEY—"Shakespeare's Philosophy of Joy and Pain."
 Nov. 6—G. WATSON, Esq.—"Notabilia of Old Penrith,"—*continued*.
 Nov. 20—Rev. T. D. STEPHENSON, M.A.—"Mendelssohn."
 Dec. 4—Rev. Canon RICHMOND, M.A.—"Dr. Samuel Johnson."
 Dec. 18—J. A. WHEATLEY, Esq.—"Gems and Precious Stones."

1891.

- Jan. 8—G. A. RIMINGTON, Esq.—"South Africa."
 Jan. 22—J. ARTHUR THOMPSON, Esq., M.A.—"Facts and Fables about Curious Animals."
 Feb. 5—JOHN WATSON, Esq., F.L.S.—"Caves and Cave Contents."
 Feb. 19—Rev. H. WHITEHEAD, M.A.—"Parish Registers," *continued*.
 Mar. 19—J. E. BOWSER, Esq., M.B.—"Hypnotism."

WINDERMERE LITERARY AND SCIENTIFIC
 SOCIETY.

9TH SESSION, 1890-91.

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The following MEETINGS were held during the Session :—

1890.

- Oct. 20—Miss WAKEFIELD—"English National Melodies, from the 13th to the 19th Centuries, comprising Musical Illustrations of each Century, and of the different classes into which English Melodies may be divided." Specimens from Dowland, Lawes, Arne, &c.
- Nov. 3—J. W. BALLANTYNE, Esq., M.D., F.R.C.P.E.—"The Dawn of the Intellect in the Child."
- Nov. 24—E. S. BRUCE, Esq.—"Fifty Years of Scientific Progress." Illustrated by Dioramic Views, Photographs, &c.
- Dec. 1—J. SEVERS, Esq.—"The Pyramid Plateau of Egypt." With Limelight Illustrations.
- Dec. 8—W. H. GOLDING, Esq.—"Stanley's Travels." With Limelight Views.

1891.

- Jan.—Major HENDERSON, Royal Military College, Sandhurst—"Modern War."
- Jan. 26—J. A. THOMPSON, Esq., M.A., Lecturer in the School of Medicine, Edinburgh—"Domestic Life among Animals."
- Feb. 9—Rev. T. MACKERETH, F.R.A.S.—"The Sun."
- Feb. 23—B. A. IRVING, Esq., M.A.—"William Shakespeare of Stratford-on-Avon was not William Shakespeare the Dramatist."

REPORT OF ASSOCIATION SECRETARY.

IN presenting its SEVENTEENTH ANNUAL REPORT, your Council, whilst able to express its congratulations with regard to steady progress and much earnest work on the part of the Local Societies, still has to regret the temporary withdrawal of the Longtown Society, and a slight decrease in the total membership.

Compared with last year the results are as follows:—

	<i>Members.</i>		<i>Transactions.</i>	
	1890	1891	XIV.	XV.
KESWICK	152	145	50	50
MARYPORT	130	110	50	70
LONGTOWN	41	—	6	—
CARLISLE	130	84	109	90
AMBLESIDE	71	84	20	20
SILLOTH	44	38	—	—
BRAMPTON	99	84	4	6
PENRITH	180	138	120	100
WINDERMERE	120	120	20	20
ASSOCIATION MEMBERS ...	40	45	40	45
	<hr/>	<hr/>	<hr/>	<hr/>
	1007	848	419	401
	<hr/>	<hr/>	<hr/>	<hr/>

ASSOCIATION LECTURER.

J. Arthur Thompson, Esq., Lecturer on Zoology in the Edinburgh School of Medicine, was engaged by the Council as Association Lecturer. As such he lectured before seven of the Local Societies, together with the Wordsworth Institute, Cockermouth; and, it is pleasing to add, gave general satisfaction.

ORGANIZATION.

This most important matter is, the Council feels, proceeding, if slowly, still surely. During the past Session a Circular was issued to the various Local Societies, and the replies received were eminently satisfactory. With regard to the first question, bearing on

THE TRANSACTIONS,

the Carlisle Society states: "It seems to this Society, that as the Volume issued annually is the only enduring record of the work of the Association, and contains the result of much patient labour and valuable research, every effort should be used to place them in the hands of the members. The most effectual and simple plan is to adopt that pursued by us, i.e., *make the charge for membership include the cost of a copy of the 'Transactions,'* which would then be forwarded by the Secretary to every member, and would be a great inducement to join the Local Society."

If this could be done generally, the hands of the Council would be greatly strengthened, whilst generous arrangements would be made with regard to the sale of back numbers. If each Local Society would briefly state in its annual Programme, that the *Transactions* are published annually, at a cost to members of 1/- each, and also that with two exceptions (Parts III. and IV.) all the Back Numbers are still in stock, this would doubtless tend much to the prosperity of the Association.

UNIVERSITY EXTENSION.

Still no satisfactory solution of this question has been arrived at. Three Societies propose taking the Course during the coming Session, whilst three others would like to do so; but financial difficulties stand in the way.

The Council is now, however, in a position to help the Local Societies for the first time: and as its list of Association Members increases, so in like ratio it is to be hoped the aid given will increase.

SCIENCE TEACHING.

Several of the Societies refer to this matter, but the suggestions do not afford the Council sufficient ground on which to formulate a scheme. One Society proposes that a prize be awarded to such students in connection with any of the Local Societies as shall obtain a first class in the Advanced Course of the Science Examinations held in connection with South Kensington. Another suggests a prize to the member of a Local Society who shall during the year produce the best Botanical, &c. Collection, with essay on the same. But the matter requires consideration.

SUB-COMMITTEES.

In addition to the Sub-Committees already appointed for the systematic recording of such matters as might be valuable in Geology, &c., the Maryport Society has appointed another in Entomology, whilst the Keswick Society is also appointing others. For the guidance of such Committees, we may quote from the last British Association Report (Leeds). Several of the Committees then appointed are desirous of obtaining assistance from Local Societies, so that their reports may be more valuable.

Amongst the subjects we may notice the following :—

1. The application of Photography to the elucidation of the Meteorological Phenomena.
2. Seasonal Variations in the Temperature of Lakes, Rivers, and Estuaries in various parts of the United Kingdom.
3. Recording the Position, Height above the Sea, Lithological Character, Size, and Origin of the Erratic Blocks of England, Wales, and Ireland, reporting other matters of interest connected with the same, and taking measures for their preservation.
4. The Collection, Preservation, and Systematic Registration of Photographs of Geological interest.
5. Disappearance of Native Plants from their Local Habitats.

6. The Rate of Increase of Underground Temperature downwards in various localities of Dry Land and under Water.
7. The Rate of Erosion of the Sea Coasts of England and Wales, and the Influence of the Artificial Abstraction of Shingle or other material in that action.
8. Considering the advisability and possibility of establishing in other parts of the country Observations upon the Prevalence of Earth Tremors similar to those now being made in Durham in connection with Coal Mine Explosions.
9. Ascertaining the Localities in the British Islands in which Evidences of the Pre-historic Inhabitants of the Country are found.

The Hon. Secretaries will gladly supply information on any of these points.

LIBRARY.

A List of Books, &c., received from the Exchanging Societies is given, and members may have the use of them on payment of carriage. Application may be made to the Librarian (R. Crowder, Esq., Stanwix) through the Local Secretary.

THE CIRCULATING LIBRARY.

The Library is now an accomplished fact. The Rules are as follows :—

1. That the Books be lent only to Members, who must apply to the Librarian through the Local Hon. Secretary; or, in the case of Association Members, to the Librarian direct.
2. That the books be kept for a period not exceeding a month, unless by permission of the Librarian.
3. That not more than Six Books be sent to each member at one time, unless the series contain a larger number, when the Librarian will exercise his discretion.

4. That the member borrowing the Books pay the carriage both ways.

5. That Books lost be made good, or their value paid by the person losing them.

The Council would gladly welcome additions to the Library.

TRANSACTIONS IN STOCK SEPTEMBER 21, 1891.

<i>No.</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
	44	68	17	3	95	227	247	218	231	36	163	154	217	236	246

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

- 1 Berwickshire Naturalists' Club, Proceedings of, for 1882 to 1887 (inclusive). 8 vols.
- 2 Bristol Naturalists' Society, Proceedings of, 1882-3 to 1890-91. 9 vols.
- 3 British Association Reports, 1886, 1887, 1888, 1889, 1890.
- 4 Burnley Literary and Scientific Club, 1874-83, 1884, 1885, 1886, 1887. 5 vols.
- 5 Canadian Institute, Proceedings, November 1886, October 1887, April and October 1888, April and October 1889, April and October, 1890, March 1891. 9 vols.
- 6 Canadian Institute, Annual Report of, 1887, 1888, 1889, 1890. 4 vols.
- 7 Cornwall Royal Institution, Journal of, October 1886, December 1887, October 1888, May 1890, March 1891.
- 8 Essex Field Club, Transactions of. 27 vols. (Incomplete—about two Monthly Parts wanting.)
- 9 Geologists' Association, Proceedings of, February 1887, to August 1891. 12 vols.
- 10 London, Geological Society of, Proceedings, 1880-1881 to 1890-1891. 11 vols.
- 11 Hertfordshire Natural History Society, Transactions of, February 1886, to December 1890. 22 vols. (Monthly or longer. Incomplete.)

- 12 Liverpool Geological Association, Journal of, 1887-8 and
and 1888-9. 2 vols.
- 13 Manchester Microscopical Society, 1887 and 1889. 2 vols.
- 14 Midland Naturalist. Monthly Parts, from January 1881, to
September 1891. (January 1885 missing.)
- 15 United States Geological Survey, Report of, 1880-81 to
1887-88. 9 vols. (1886-7 in 2 Parts.)
- 16 Manchester Geographical Society. Vol. 6, January to March
1890.

ODD VOLS. RECEIVED IN EXCHANGE.

- Birmingham Natural History and Microscopical Society
Transactions, 1883. 1 vol.
- City of London College Science Society, 1887-8. 1 vol.
- Liverpool Science Students' Association, 1884-5. 1 vol.
- Lewisham and Blackheath Scientific Association Proceedings,
1886. 1 vol.
- Norfolk and Norwich Naturalists' Society Transactions, 1884-5.
1 vol.
- Stirling Natural History and Archæological Society Trans-
actions, 1885-86. 1 vol.
- Stockport Society of Naturalists', Report, 1887. 1 vol.
- Leeds Geological Association Transactions, 1886-7. 1 vol.
- Yorkshire Naturalists' Union, 1882, 1883, 1884. 3 vols.
- Allgemeine Geologische Karte von Russland, 1885. 1 vol.

VOLUMES GIVEN.

- Memoirs of Geological Survey, 1846 and 1848 (2 Pts.) 3 vols.
- Do. Mineral Statistics, 1864—1873. 10 vols.
- Do. Iron Ores of Great Britain, Parts 2 and 3. 2 vols.
- Do. British Organic Remains. Decades I. to XIII. 13 vols.
- Catalogue of Minerals (Jermyn Street). 1 vol.
- Catalogue of Models (Jermyn Street). 1 vol.

- The Publications of Geological Survey, 1884. 1 vol.
 Guide to Geology of London (Whitaker, 1875). 1 vol.
 Portlock's Geological Report on Londonderry, Tyrone, and
 Fermanagh (1843). 1 vol.
 26 Pamphlets (Geological) by Professor Harkness. 26 vols.
 Microscopy and Natural Science, Journal of, January 1884.
 1 vol.
 Naturalist, The, August 1884. 1 vol.
 British Astronomical Association, Journal of, October 1890.
 1 vol.
 Time-Reckoning for the 20th Century, 1886. 1 vol.
 L'Exposition Geographico Botanique de Copenhagen. 1 vol.
 The Cause of Light. Rev. G. T. Carruthers. 1 vol.
 Arguments on Treaty of Limits between Costa Rica and
 Nicaragua. 3 vols.

BOUGHT.

- Official Year Book of Scientific and Learned Societies.
 (Griffin & Co.) 1888 and 1889, 1890 and 1891.
-

ON THE STUDY OF LOCAL ARCHÆOLOGY.

INAUGURAL ADDRESS, DELIVERED AT MARYPORT.

BY THE

RIGHT REV. THE BISHOP OF BARROW-IN-FURNESS.

It has been the custom of your Association that your President should occupy his honourable position for two successive years. It appears to me that, whatever the advantages or disadvantages of that course in other respects, at all events both the President and those over whom he presides might well be released from a second inaugural address. Such, however, has not, I am told, been your rule ; and therefore it is my duty to address you to-day. But on this second occasion, I need not detain you by any very lengthy remarks, especially as we have before us a somewhat full programme of papers to be read.

Your Association exists chiefly for the purpose of encouraging the various local literary, scientific, and naturalist societies which exist in Cumberland and Westmorland, and making their proceedings better known to each other. These smaller local associations are of very great benefit. They ought by all means to be perpetuated and encouraged ; not only because they collect and record a number of local facts and observations which are of value and might otherwise be lost, but also because they extend the love of such studies to a great number of people whose position and avocations do not permit them often to travel far from home, but who may derive from them great pleasure and benefit. We are all only too apt to let our minds be confined to the narrow round of our own daily employment. And it seems to me

that there can hardly be a greater benefit to any young person than to lead him to a taste for some intellectual pursuit outside the groove of that which is to be his own special work in life. People may call, and do call, such things "fads." In my opinion, one of the best gifts we can make to a lad, is such a wholesome "fad."

I purpose to-day to say a few words to encourage one such pursuit, namely, the study of local Archæology. I cannot call myself a real archæologist: I have never had the time to take up such pursuits very seriously. But an educated man can hardly live in such a country as ours without desiring to know something about the history and character of those who have lived here before him, and whose record he sees, in their handiwork, on every side. And thus local antiquities have been to me, as I said just now, a pleasant and wholesome "fad," an interesting and useful relaxation from the more serious work of life.

In our Northern part of England there is much work to be done by persons interested in antiquarian subjects, because of the rapid changes which have taken place during the later part of this century, or which are still in progress. Thus, old words and modes of speech, are passing rapidly away under the influence of educationists, who consider the language of a Cockney Training College to be far superior to the good old tongue of Cumberland and Westmorland. South-countryman as I am myself by birth and education, I have no sympathy with a parent who told me exultingly concerning her children: "They tak' greit pains wid them; they're gitten' quite to speak wid a sooth-country twang." And if there are any other south-countrymen here, let me urge them to make careful notes of phrases or terms of language (as well as words) to which their ears are unaccustomed, for after a time they will not be equally sensitive to them. Old customs, too, are rapidly passing away in consequence of increased intercourse between different parts of England. And in some districts enclosures and extended cultivation, in others the changes caused by the growth of population, have destroyed or are destroying the relics of ancient times. And although the larger and more con-

spicuous remains of antiquity are well known, almost every district contains some which are hardly known beyond the immediate vicinity, but are not less worthy of study.* Let me take as an illustration some of the objects of antiquarian interest within a moderate walk of Kirkby Lonsdale, the home in which I spent twenty-six years. You will see that they may be used to illustrate almost every part of the history of Britain, and yet the district was not exceptionally rich in such objects. Of the earliest periods of British history, before the Romans came to this country, there are in that immediate neighbourhood few certain remains. There is a stone circle on Casterton Fell, which might perhaps be found, on careful investigation with the spade, to be sepulchral. There is what may possibly be a circular hill fort near Leck, and some barrows have been opened without much result.

When, however, we come to the Roman period we find many important remains of that great people. The "Maiden Way" ran up the valley of the Lune, in one place on a high causeway over marshy ground; and, it would be very desirable to trace it out in detail throughout its course. A large and important camp was situated at Overburrow, two miles from Kirkby Lonsdale: parts of the rampart may still be seen, and some capitals of pillars and other sculptured stones are preserved. I have in my possession a stone mortar, said to come from the camp, but it is too bulky to bring here to-day.

The Romans left Britain, but the native tribes retained some of the Roman civilization, and probably some intermixture of Roman blood. Have we any relics of that period? Yes; two miles from Kirkby Lonsdale, there are remains of a British settlement, traces of huts and cattle-pens surrounded by an earthwork. And the iron implement, of which this is a drawing, which we found in excavating the remains of a circular hut, fixes the date. This is one of a very distinctive class of implements, called "hipposandals," about the use of which archæologists are not altogether agreed,

* I should like to call the attention of any who have not seen it, to a most interesting work, *Forty Years in a Moorland Parish*, by the Rev. J. C. Atkinson, published by Macmillan.

but it is probably a peculiar kind of horseshoe. Only a few have been discovered in England and on the continent of Europe : but all those known have been found among remains of the late Roman civilization. Therefore this implement fixes the date of the settlement in which it was found : it was about the time when the Romans left Britain.

To the Briton, who had received a certain varnish of civilization from his Roman master, succeeded the stronger and ruder Saxon conqueror. All down the Lune valley the Saxons have left the earthen mounds which were their castles and homesteads. Some, as in the vicarage grounds at Kirkby Lonsdale, a simple mound surrounded by a ditch ; others on a larger scale, as at Burton-in-Lonsdale, an inner fortress for the lord and his household, an outer enclosure for the serfs and cattle. The Saxon came, a heathen ; before long, the church sought him out, in this district through Celtic missionaries from the North and West, and converted him to Christianity. The earliest trace of Christianity in the Lune valley is the rude stone cross at Barbon, specially interesting because it stands close to the old Roman road ; and there is some reason to think that the stone was placed there as a heathen emblem, long before the cross was cut upon it to make it Christian.

Once more came heathen invaders : the Danes forced their way up the valley of the Lune from Morecambe Bay, as they did into many other of our peaceful dales. Here is a trace of them. Some heathen Danish chief wore this silver brooch to fasten his plaid or cloak ; and as he went along the Roman road, the one highway then and for many centuries afterwards, death overtook him. It may have been from some sudden illness ; it may more probably have been by the sword or arrow of one of the natives of the valley he was plundering. But at all events, there he died and was buried hard by the side of the Roman road, some time in the 10th century ; and, nine hundred years after, his brooch was ploughed up, and then put away in a cupboard and forgotten for another fifty years, and then was just going to be sold for a few pence as old metal, when happily, by a mere accident,

attention was called to it, and its history was routed out. I tell you the story now, that you may realize the good of local archæological societies, which would keep alive the memory of such finds in their several localities, and perhaps provide museums in which they might be preserved.

And then the Dane's children or grandchildren in their turn became Christian, and the name of Kirkby Lonsdale, the church-town of the Lune valley, commemorates the change, and the foundation of a parish church. And then came the Norman, and began to rebuild it; and each century from then till now has left its marks still legible upon the fabric.

I have taken the neighbourhood which I happen to know best, as an illustration of the manner in which materials for archæological illustrations of the history of two thousand years may be found within an afternoon's walk by many or most of us; and by following these up we may not only provide a most interesting and healthy pursuit for our leisure time, but also help in preserving the record of many noteworthy objects which might otherwise pass away and be forgotten. I know much less personally of this immediate neighbourhood, but I have seen or read enough to be sure that it also may furnish materials for interesting study and provide many illustrations of our national history. Thus, to begin with the prehistoric age. You have near here (as is recorded in the Transactions of the Cumberland and Westmorland Archæological Society) instances of those cup-and-ring marked stones, the meaning of which is a problem yet unsolved. You have a Roman camp within a few hundred yards of this place, and in its immediate neighbourhood has been discovered perhaps the most remarkable collection of Roman altars which has ever been found in England. They are preserved safely and close to you at Netherhall, and we shall visit them, I hope, this afternoon. At Dearham and Cross-canonby churches, are hog-backed tombstones and carved crosses of Early Saxon times, when the Christianity of the English people was still isolated from that of southern Europe, and retained something both of the thoughts and of the art of their heathen forefathers. There are examples also of Early Mediæval work in

gravestones and in the fabric of the churches themselves. Of the character of this neighbourhood in Later Mediæval times, you have a most interesting illustration in the fortified church tower at Dearham, which was meant less for a belfry than to be a fortress for the parish. The fact that almost every old manor house has grown, like Netherhall, around an old peel tower, is remarkable enough as an evidence of the unsettled state of the district three or four hundred years ago : but these fortress churches tell the tale of border frays in a more striking manner still.

Let me urge then all members of this Association to interest themselves in observing and recording the antiquities of their own neighbourhoods. The study will greatly increase the interest of your reading of history, and the vividness of your historical knowledge :

“*Segnius irritant animos demissa per aures
Quam quæ sunt oculis submitta fidelibus.*”

You may often be enabled to record or preserve things which might otherwise be entirely lost. And as regards those around us, in encouraging, more especially in the young, the observant eye, and the intelligent interest in what is seen, whether in antiquities, or in natural history, or in art, we are developing the higher parts of our human nature, and adding immensely to the store of human enjoyment.

THE LAKE FLORA.

BY THE REV. W. TUCKWELL, M.A.

(*Read at Ambleside. Inadvertently omitted from the last Number.*)

FOR botanical purposes the Lake District is bounded on the east by the river Lune, so far as to Low Gill station, thence, as far as Penrith, by the Lancaster and Carlisle railway; on the north by a line loosely drawn from Penrith to Allonby through Wigton; on the west by the Irish Sea; on the south by Morecambe Bay;—containing mountain, moor, plain, river, lake, sea-shore, bog; including in its geological formation igneous rock, slate, Old and New Red Sandstone, Mountain and Magnesian Limestone—it presents all the conditions of a rich and varied flora.

Of the 1430 wild plants recognised as British, aboriginal or introduced, about 900 are found in the Lake District. Of these eleven only are strays from eastern England; twelve only from western England; no less than two hundred ascend from southern England; all the rest are either general in their distribution throughout our island, or have their head-quarters in Scotland and in northern England.

You are aware that the prevalence of particular floral types is largely influenced by height above the sea. The majority of your Lake plants grow to 900 feet, at which point the Blackberry, Crab, Alder, Gueldres Rose, Bay Willow (*S. fragilis*) cease to thrive, arable cultivation becomes rare, and inhabited houses are few. Scattered farmhouses there are even at a height of 1800 feet,

considerably higher than the little inn of Kirkstone Pass, which is only 1500 feet above the sea, and whose supremacy in elevation is a guide-book myth. Nearly all the mountain tarns are found between 900 and 1800 feet; above which point Bracken, Foxglove, Heather, Lousewort, Grass of Parnassus—no longer grow; nor are any trees met with, except a scanty Juniper or Rowan on the higher crags. Between 1800 and 2700 feet two tarns only exist, Red Tarn and Sprinkling Tarn; the rest is bare hill and slate, containing an Alpine flora, with mosses and aquatic plants bordering the highest springs. Above 2700 feet, on the summits of the highest hills, are two plants only, the Dwarf Willow (*Salix herbacea*), and an Alpine variety of Carex (*C. rigida*).

The following plants, familiar or not uncommon in many parts of England, are, so far as I know, altogether absent from the Lakes:—Mousetail, Stock, Cabbage, Tamarisk, Sea Mallow, Field Eryngo, Parsnip, Madder, Small Teasle, Milk Thistle, Large Burdock, Ivy-leaved Hairbell, Dodder, Fringed Bogbean, Pointed Toadflax (*Linaria elatine*), Cornish Moneywort, Broomrape, Wild Sage, Water Violet, Large Water Dock, Annual Mercury, *Salvia verbenacea*, Sweet Rush, Stinking Iris, Frog-bit, Chara. Rarer plants not found within your boundaries are Pasque Flower, Cotoneaster, Marsh Sowthistle, Lovage, Linnæa, Meadow Sage, Blue Gromwell, Gibbous Duckweed, Galingale.

Plants not altogether wanting, but rarely met with in the Lakes, are the Medlar, of which two trees only are recorded wild, both in Walney; Small Mallow, Pennywort, Samphire, Miseltoe, Scotch Thistle, Bird's Nest, Common Bindweed, two Fleabanes (*Erigeron acre* and *Inula dysenterica*), the two Horehounds (*Marrubium* and *Ballota*), Calamint, the Spiked- and the Ivy-leaved Speedwells, Sea Convolvulus, Dewberry, Weaselnout, Bugloss, Viper's Bugloss, Houndstongue, Pyramidal Orchis, Fritillary, Autumn Crocus, Water Soldier, and the four ferns—*Woodsia*, *Thelypteris*, *Asplenium septentrionale* and *A. lanceolatum*.

Plants on the other hand, comparatively rare elsewhere, but met with in the Lakes, are the Spearwort, Baneberry, Barrenwort, Moss Champion, Balsam, Dryas, Shrubby Cinquefoil, Alpine Lady's

Mantle, Alpine Enchanter's Nightshade, Cloudberry (*Rubus chamaemorus*), Fly Honeysuckle, Pyrenæan Valerian, Salsify, Orange Hawkweed, Broad-leaved Ragwort (*Senecio saracenicus*), Leopard's Bane, Elecampane, Bearberry, Goldilocks, Tufted Loosestrife (*Lysimachia thyrsoiflora*), Trientalis, Sweet Daphne, Asarum, Lady's Slipper, Snowdrop, Snowflake, Chives, Lily of the Valley, Herb Paris, Film Fern, Feather Grass.

More especially characteristic of the Lakes are the Bird Cherry and Wild Cherry, Orpine, Grass of Parnassus, *Saxifraga aizoides*, Butterwort, Giant Bellflower, Water Lobelia and Quillwort, Mealy Primrose, Crowberry, Juniper, Parsley Fern, Club-moss, Buck-bean, Wych Elm.

The Isle of Walney {flora is so interesting, so varied, and so little studied, as to call for separate notice. It includes the Sea Meadow-rue, Hairy Buttercup (*Ranunculus hirsutus*), Sea Rocket and Sea Kale, Danish- and English Scurvygrass, Four-stamened Cerastium, Marsh St. John'swort, a variety of Violet known as *Curtisii*, of Geranium known as *Lancastriense*, of *Erodium* known as *pilosum*; Medlar, Burnet Rose, Sea Holly, Sea Wormwood, Marsh Gentian, Sea Bindweed, Henbane, Saltwort, *Glauxmaritima*, Buck-horn Plantain, Sea-mat (*Ammophila arundinacea*), Sea Mertensia, the Sea Lavender known as *Statice bahusiensis*, the Sea Purslane, Portland Spurge, *Triticum littorale*.

I have so far given the established English names wherever they exist; but it will be interesting to notice certain local names of obvious or unintelligible origin. Everyone can interpret *Meg wi' mony feet* for the Creeping Buttercup, *Old woman's purse* for the Touch-me-not, *Robin run by t' dyke* for the Cleaver Grass, *Cat's foot* for the soft pad-like head of the wild Everlasting, *Knops* for the Devil's-bit Scabious, *Crones* or *cranes* for the Cranberry, a word borrowed from Denmark, where the plant flourishes when the cranes return, *Candlewicks* for the great Reed Mace or Bull-rush. The name *Queen of the Meadow*, belonging elsewhere to Meadow-sweet, is applied in Langdale to Claytonia; Meadow-sweet itself is *Burnet*; old man or Southernwood is *Lad's love*, a name due, thinks Dr. Prior, to the fact that an ointment distilled from the

plant and applied to the face was much used formerly by lads impatient for the growth of a beard. *Mayflower* is not inappropriate to the Cuckoo flower, nor *Cuckoo's bread and cheese* to the Wood Sorrel, both blossoming when that "wandering voice" is first heard. *Easterledge* for the Bistort is corrupted from *osterick*, with a conjectural and mistaken reference to *aristolochia*, a name belonging to another plant. *Ling-berry* is a confusion of the somewhat similar crowberry with ling or heather. *Heckberry* for the bird cherry is hedge-berry; *Paddock's pipe* or toad's pipe applies easily to the long slender tubes of horse tail; *Fellon grass*, the green hellebore, was used by herbalists to cure whitlows, called in medical Latin "little thieves" or "felons." *Bull toppins* is pool toppings, from the tuft-like trusses of the *Aira cæspitosa*, growing in pools and bogs. *Moss crops* belongs to the woolly crop or head of the mossgrowing Cotton plant. *Kesh*, in midland England *kecks*, in Shakespeare *kecksies*, is a name given to any of the hollow stalked umbellifers, and is either from the old English *keek*, to peep through the stems, or corrupted from *cicuta*, hemlock. The name Keswick is said to be derived from it. *Hen-pens* is Yellow Rattle, in reference probably to the round flat seeds, altered from *henpence*, used in Lincolnshire for the money payment to the lord of the manor for liberty to keep hens. *Yorkshire fog* is the soft meadow grass, fog being in general use for aftermath. Why Houseleek should be *Syphell*, ragwort *Booins*, oxlip *Goupil* and *Sinkin*, some present may be able to explain; I have failed to find the clue. In fact it must be understood that several of my statements are made "under correction." My Lake flower lore belongs to me in botanical language as an "alien," not as a "native;" and though I have botanised in the district much and often, and have availed myself of all published records and of many verbal communications, there must be points on which habitual residents are able to supplement, modify, or negative facts which I have accepted and alleged.

What has the Poet of Nature and of the Lakes to say about the flowers of his home? Less than we could have wished; and that little encumbered by the fact that Wordsworth was no naturalist;

had failed, that is, to qualify as a teacher from the book of nature, by studying the grammar of its language. Like his contemporaries Southey, Moore, Keble, Scott—though unlike Crabbe, who alone amongst the brotherhood was an accomplished geologist and botanist—he gazed on nature with an uneducated eye, stumbling now and then upon a scientific truth, and handling it with tantalising power; but missing at every turn lessons, suggestions, principles, pregnant with poetic force. One graceful poem he disfigures by a sneer at botanists, unconscious that though a primrose by a river's brim was vastly more to Peter Bell's creator than to Peter Bell, the one was as ignorant as the other of the wondrous life-history which the flower unfolds to the humblest botanical student. Yet we may be deeply thankful for that which he has given us; for the primrose tuft veiling the wren's nest, for the circlet of snowdrops edging the orchard rock, and the somewhat thin sonnet to the same flower—for Love lies Bleeding, for the Oak and Broom—for the exquisite picture of the *Osmunda*, so often quoted, so rarely quoted rightly—for the delicate Pantheism evolved from the torn hazel boughs—for the belief, repeated oftentimes in varied words, that "the meanest flower enjoys the air it breathes"—for the awful grandeur of thought and diction which has apotheosised the Borrowdale yew trees—the plea for strawberry blossoms—the rustic hats trimmed with stag-horn moss—the glorification of the lesser celandine—the daisy protecting the dewdrop, and embroidering its star-shaped shadow on the stone—the three special odes to the daisy—the loving description of the moss campion; above all, the delightful poem on the daffodils, instinct and resonant in every line with the rustling toss of the flowers and the crisping ripple of the Ullswater waves, and containing the two perfect lines ascribed to Mrs. Wordsworth, the only two, apparently, which she ever contributed to his creations. [Here followed a description of the Lake plants, whose English names were suggestive of interesting facts, historical, mythical, scientific.]

Let me end with two practical suggestions. One, that you should form a society not only for the preservation of your precious flora, with the diffusion of your rare species, but also for

the education and enlightenment of your annual visitors, by the publication of leaflets on the flora of the district, and the organization of field excursions judiciously shepherded by local naturalists. The other—a recommendation emitted not for the first or second time—that you should lay out and stock in Ambleside or elsewhere a small botanic garden, containing specimens, systematically arranged, of all except the commonest plants which the Lake District has been ascertained to yield. Charge for admission; cultivate rare species for sale; and you will at once protect those plants which amateurs will collect from your depository rather than eradicate from their native haunts, and will create an institution not only self-supporting but remunerative. One parenthesis let me here interpose. If this proposal—if any proposal for the good of the district—is to thrive, you must jealously guard for yourselves and for your visitors the right of access to these beautiful spots, rich in botany, in geology, in scenery, which virtually constitute the Lakes. On all grounds, social or economic, landowners and lords of manors are amongst the worst enemies of the community—leave us to extirpate them elsewhere, as we shall do, by socialistic legislation—but, here in Lakeland, band yourselves at once to keep their hands off what is a source of income to some of you, a source of joy and health to all. Otherwise, if strangers come to realise that the approach to Skiddaw is mutilated, convenient access to Easdale debarred, Wansfell a prey to “sufferance,” ascent to Loughrigg traversed by the devious bullets of experimenting patriots, their yearly influx will be diverted to less servile and less sophisticated regions, Lake tradesmen and inn-keepers will be ruined, and it will serve them right. It has pleased God to plant your life-long and abiding home in a spot which, for a few weeks in intermittent years, is to most of us a glimpse of Paradise; is it too much to indicate, in such an enterprise as I suppose, some recognition of your less blessed fellows’ claims, some repayment of your own debt to Providence?

A ROMAN RECREATION GROUND:
THE CAMPUS MARTIUS OF GLANOVENTA.

BY THE REV J. I. CUMMINS, O.S.B.

(Read at Maryport.)

To one who cares to muse upon the changing pageant of the world's history, and to call up the story of bygone days, the scanty remains of our Roman station are full of interest. Let such a one take his stand on the mounds by the north-east gate of the Camp, the Prætorian gate of Glanoventa. There he will see still standing the lintels of doors that once kept out the Picts and Scots, the ruts made by chariot wheels in the pavement, courses of stones as they were laid in the wall seventeen hundred years ago and never since disturbed; and all around the shapeless mounds that hide the ruins of the streets and dwellings of the Station. How eloquently those stones still speak of the might and the broad dominion of the empire that carved such lasting traces even on the hills of far-off Britain! But one who looks carefully may notice another and more familiar mark. Deeply stamped on those historic stones is the seal of the nation that has succeeded to the world-wide sway of Rome. The Empire of Great Britain, as though to claim the heritage of universal dominion, has put its mark—the fingers of an outstretched hand—upon these old ruins; and the broad arrow of the government of Victoria is stamped upon the gate posts of the camp of Agricola.

Another striking coincidence in this connection has often been noticed. From the days of Tacitus people have remarked how

well chosen were the sites of Agricola's encampments. One of them was this great Watch Camp on the Solway, and a curious confirmation of the judgment of his biographer was afforded a few years ago when this very site was chosen as a station for coast-guards and a battery for our naval reserve. The same causes produce the same results, similar needs require similar remedies. When modern England therefore wants a station for the protection of the Solway, she chooses the identical spot on our historic hill which Agricola selected and Hadrian approved for the same purpose eighteen hundred years ago.

I would now draw attention to another curious coincidence of a like kind. There is good reason to believe that the recreation ground of modern Maryport is identical with the playground of ancient Glanoventa. A few months back the Trustees, with commendable public spirit, decided to provide a playground for "the mercurial youth" of the town; and after casting about for a suitable site they selected a vacant field near the hill top. I believe that they have unconsciously chosen the very spot that was used for a similar purpose sixteen and seventeen centuries ago; and that the same sense of the fitness of things, the same instinct which led the Admiralty to choose the Roman camp for their coastguard station has guided the Trustees to adopt as our children's playground the Campus Martius of Glanoventa.

No one who carefully examines the new recreation field can fail to notice two features in its conformation. First, and very conspicuous, is the mound or circular elevation which rises towards the sea-face of the field, and has recently been furnished with some rustic seats. Second, not so noticeable at first sight, but easily recognised when pointed out, is a remarkable piece of perfectly level ground lying at the foot of this mound. The mound, which is certainly artificial, is popularly known as "Pudding Pie Hill," a name adopted by the Ordnance Survey but probably not older than the last century. It was long thought to be an ancient tumulus, or grave of some forgotten chieftain; and was at one time known as "The King's Burying Place." It certainly bears a striking resemblance to a tumulus; and if

not of Roman work, might have dated from the later ages of the Danish invaders or the British kingdom of Strathclyde. But when the mound was explored in 1742, and a trench dug through the centre, though there were clear signs of its artificial character, yet nothing was found in it—no coins, no urn, nor anything to indicate a human burial place. The bones of some animals were found, together with a few wood ashes; these are probably the remains of a dedicatory sacrifice, and their presence fits in perfectly with another explanation of the purpose of the place—with the new theory which I have now to suggest.

The general surface of the field in question is not at all level naturally, being the ridge of a hill which slopes downwards and with some regularity, on every side except on the north-east where it adjoins the camp. But about the middle of the field we suddenly come across a space which is perfectly level, somewhat in the shape of a square. It looks like some prehistoric cricket ground: in fact, the level is so perfect that a few years ago a local club wanted it for their pitch, and boys even now use it for their improvised cricket games. It is the only level spot on the whole hill, and can hardly be natural. Moreover, one can see plainly where the ground on the east side has been sharply cut away out of the natural slope; and again on the opposite side, where the made earth ends abruptly. One suspects that this level clearing must have had some relation with the mound that rises about the middle of its north-west face. If one is artificial then so is the other; and if both are, the conclusion is hard to evade that both are the work of one and the same time and people. Who made them, then? Well, who made all the artificial works in this neighbourhood—the mounds and slopes of which our hill-top, from the Camp to the Mote, bears such distinct traces? There is no record of any settlement here later than Roman-British times. The long dim centuries between the destruction of the Station and the building of the first farmhouse on the Brow are the Dark Ages of our local history; and nothing remains to suggest that during them the site of the Station was anything but a waste, with at most a solitary homestead upon it. The inference is irresistible

that both the level and the mound date from the era of Roman-Britain, the only era in which our hill-top was inhabited, the only era whence any explanation is forthcoming as to the purpose of such works. We might notice further that no remains have ever been found in this field, and no traces of buildings or roads. All the streets, houses, temples of the station appear to have been either within the camp, or on its opposite side; a valid argument that the town did not extend in this direction, and that the field in Roman times was a large open space.

Going on next to enquire what could be the purpose of such a place near a Roman station, archæology comes to our aid, and guides us to an answer by what it tells of similar places in other parts of the Roman world. I would suggest, then, that this curious field was the circus or amphitheatre of the Station, the place where the games and races were held, the exercise ground for the garrison of the camp, perhaps sometimes the scene of gladiators' combats. The mound I take to be the site of the president's seat, or raised place of honour overlooking the plain whereon would be fixed the standard of the legion, and beneath it the chair of the tribune or governor of the camp. To suggest a comparison with the Coliseum of Rome, or even with the less famous amphitheatres of the great provincial cities, may seem too ambitious. But I really believe that we shall get the most appropriate name for the field, and the best idea of its object, if we call it the Field of Mars, the Campus Martius, the Champ de Mars. To some of you the latter form of the name will suggest very different associations, recalling perchance the great plain in the heart of a gay capital, where all the peoples of the world were lately assembled beneath the shadow of the Eiffel tower. There is more in the comparison than you might fancy. The Champ de Mars at Paris, whereon the Universal Exhibition lately stood, is merely the Campus Martius of the old Roman station, Lutetia Parisiorum. It bore the same relation to the colony of an obscure Gallic tribe settled by "the mud banks" of the Seine as this field of ours did to a less famous, but hardly less ancient, settlement among the Britons. The chief difference between the

two is an accidental one. The British colony of Glanoventa, after flourishing for three centuries, sank at last beneath the onslaught of the Picts sixty years before the Franks had crossed the Rhine; more hardy or more fortunate, the Parisian colony survived centuries of conquest and contest and grew to be the capital of the French nation. But the purpose, if not the name, of the two sites was similar. The same martial exercises, the same games and combats took place on this level field outside the walls of Glanoventa as were held in the Campus Martius of Paris, and of every colony in the Roman world.

You must all have heard of the love which the Romans had for the sports of the circus, and how the passion increased with the declining years of the Empire until the degenerate children of the Republic bartered even their liberties for Bread and Games. *Panem et Circenses*; Food and Fun! Any tyrant or usurper could secure popular support, and allay the deepest discontent if he would but satisfy this incessant cry. Huge amphitheatres were erected, of which the Coliseum is only the most famous, where month by month the people crowded to witness their favourite sports, or feast their eyes on the savage contests of the gladiators. The passion spreading throughout the provinces left its traces on the very confines of the Empire. Wherever a Roman soldier or citizen settled he took with him this taste for the excitement of the ring. No important city in Italy or Gaul was without its circus; and when all else is gone, their gigantic ruins still witness to the wealth and labour that were lavished on these buildings. In their own humble way, the cities of distant Britain imitated the glories of the capital. Rude but spacious amphitheatres may be found amongst the ruins of our old British towns; and on the bare hill sides above the Tyne, near the stations of the Roman Wall, the trained eye of the antiquarian can still trace the outline of circus or theatre where the legionaries beguiled the weariness of peace and trained themselves for actual war. Of course the theatre or Campus Martius of a small frontier station was often fashioned in the most primitive way. The nearest level sward was chosen for the purpose, or the circus was cut out of the side of a hill

where the slope furnished a natural vantage-ground for watching the sports beneath. Such has been the procedure at Maryport. The remarkable terraces in Geltsdale have had a similar origin ascribed to them. Something of the same kind may be seen at Mayborough near the gates of Lowther Park, though these are more probably of British than of Roman work; and a level field by the camp at Hardknott, in Eskdale, bears a very close resemblance to this one at Maryport.

The following description from a classical dictionary of the original Campus Martius at Rome will give some idea of the object of these places:—"It was a plain without the walls of the city where the youth performed exercises, learnt to wrestle and box, to throw the discus, hurl the javelin, ride the horse and drive the chariot. Public assemblies were held here, the officers of state chosen, and audience given to ambassadors."

In our field then we have, as I believe, the recreation ground of the station and the place of exercise for the garrison. There is ample room for sports such as foot-racing, boxing, and wrestling, and even for races with chariots. The actual level space is a parallelogram about ninety-five yards in length and ninety-three in breadth, which would leave plenty of room for a good-sized track for either foot or chariot races. The spectators would stand on the elevated ground to the north-east, which rises some eight feet, or on the mound already mentioned, which is about four feet above the plain. There must have been some level place near the camp where the infantry could exercise and drill. Inscriptions on the votive-altars found here indicate that cavalry also was attached to the garrison, at least during some periods; if so, the field would serve for their drill also.

To sum up briefly the points of my argument. A circus or Campus Martius was provided at nearly all great Roman stations; and might therefore be looked for at Maryport. No site in all the neighbourhood is so suitable for the purpose as the one we are examining. There is evidence that it has always been an open space unencumbered by buildings: and the surface shows distinct traces of having been artificially levelled. An artificial mound

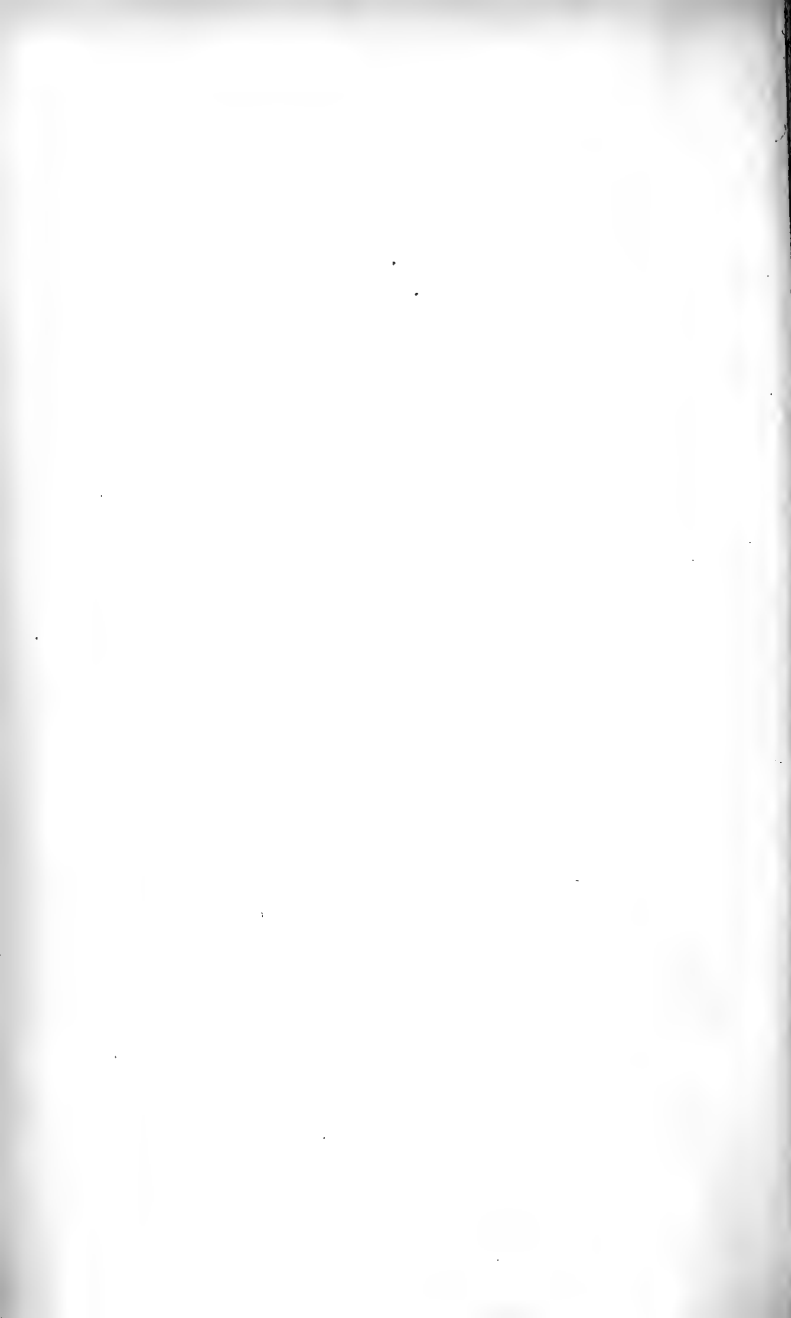
(misnamed a tumulus) rises on one side, just as though it were a platform for the president or umpire. The only explanation forthcoming of all this is that the field has been shaped and levelled for the purpose mentioned; in a word that we have discovered the "Campus Martius of Glanoventa."

If my conjecture is trustworthy, and we have really identified the Campus Martius of our Station,—then that little mound with the ridiculous name must have witnessed some strange scenes! The eagles of Rome have been planted there, and beneath them have stood mighty men who have made history, and whose names will never die. Agricola, our founder and first citizen, can hardly have made time in his hurried campaigns to arrange for the sports of his legions, and there was no need of mimic warfare for those who served under him. But Marcus Mænius Agrippa, who commanded the fleet in these waters forty years later, and who certainly dedicated four altars here—he may well have presided on this spot; as perhaps did his friend the Emperor Hadrian, when building his famous Wall; and if so the visit would give occasion to the commemorative tablets which have been found. The aged Severus may have come here after his victorious campaign against the Picts, when he was strengthening the Wall which sometimes bears his name; and if accompanied by his two sons, Geta and the fratricide Caracalla, who both made the campaign with him, then the old Station has seen some of the very worst as well as the best of the masters of the world. The Cæsar, Constantius, during his long and vigorous government of Britain from the capital at York, surely visited so important a Station, even if his son Constantine the Great did not. Half a century later Theodosius or Stilicho may have passed through on their expeditions against the Picts, when the failing Empire turned to bay, and for the last time drove off its foes. And here, probably about the same time, dwelt a Roman officer, one Calphurnius, with his child Patrick, who lived to become the "Light of the West!"

Some may think that this is giving reins rather freely to the historical imagination: but one object of a society like ours is to impart a literary flavour to antiquarian pursuits. We must try to

make the old days live again, to clothe with flesh and blood the dry bones of archæology, and to people these old stations with living men and women. Suppose then we call up in fancy some such scene as the camp must have often witnessed during its three centuries of existence. Imagine the inhabitants of the station gathered together on this spot for some review or sports, in celebration of a visit from the governor of the Province, or even from Cæsar Augustus. Here stand the stalwart forms of the auxiliaries, Dalmatians, Spaniards, Mauritanians, who compose the garrison—veterans who have settled down and made a home in the country; here are a few of the better classes of the district, chieftains of subject tribes, or provincials connected with the officers of the legion; and there are groups of the native Britons, rough-looking people, but not clothed merely in blue paint, as we used to be so falsely taught. Most of the latter are standing or seated on the slope to the north-east, where the rising ground enables those behind to see easily over the heads of the spectators in front. Amid the blare of trumpets the standard-bearer of the legion advances and plants the eagle on the mound; and there, taking his place beneath, stands the tribune or prefect in command of the Station, or occasionally the governor of the Province, or even the Divine Emperor himself! Around him are a group of officers; near at hand a few patrician ladies, some of whom have seen the glories of the City, and look with a sneer on their fair lips at these provincial assemblies, though not even in the Coliseum have they witnessed greater valour than that with which the poor captive here defends his life. The sports proceed. Wrestling, racing, boxing were popular in Cumberland then as they are now, and perhaps were not much more rough. Even a Roman athlete or wrestler might have dreaded the grip of a Cumberland champion, and have shrunk from a scuffle at Rugby football! Perhaps the large crowds are attracted by a gladiatorial contest. Some poor Pict from the wilds of Galloway across the Frith has thrown himself in desperate raid against the walls of a Roman fortress, or the wall-like phalanx of a Roman legion. He is given a chance of life now with his rude native weapons in his

hands. See with what despairing courage he offers his painted body to his well-armed foe ; see him at length, amid the yells of the spectators, stretched bleeding on the turf, "butchered to make a Roman holiday,"—on that very sward where now romp our 'young barbarians all at play." Truly, if ghosts ever walk, the peaceful slopes of that field should witness some gruesome sights, and the householders of Camp Road, looking from their windows on some moonlight night, might hear horrid sounds, and see strange spectres, as the wraiths of captives and gladiators haunt the field where they last struggled in death. There is nothing new under the sun. What has been shall be again, when the wheel of time and fortune has revolved. Who shall say that the past never returns when English sailors are at exercise on the very slopes that were trodden by the legions of Rome, when our coastguard still watch the shores once held by Spanish and Dalmatian auxiliaries, when the cannon of Victoria sound over the Solway from the ramparts of a fortress of Agricola? More than that, on the very spot where the youth of bygone Glanoventa raced and wrestled and fought, the children of modern Maryport play cricket and football—and sometimes fight! Even the perilous sports of the gladiators there are paralleled by the dangers of the gymnasium and giant-stride. One thing further is still wanting : but perhaps before long our local bands may discourse sweet music to a peaceful people from that historic mound where Agrippa or Constantius once stood beneath the Roman eagles, to watch the sports and direct the drill of the legions that garrisoned Glanoventa.



BOTANICAL "WAIFS" IN CUMBERLAND.

BY WM. HODGSON, A.L.S.

(Read at Maryport and at Carlisle.)

THE date of my earliest investigations on this question may be set down as co-eval with the opening of the first floating dock constructed in Cumberland, viz., the Marshall Dock at Silloth. This was shortly succeeded by the Elizabeth Dock at Maryport, the Lonsdale Dock at Workington, the Whitehaven Dock, and the Senhouse Dock at Maryport. The ballast from merchant ships and the sweepings from the holds of vessels when exposed upon the beach—especially at Silloth and Maryport—have been found covered with vegetation differing widely in character, according to the localities from which the ballast, etc., has been brought. Perhaps as much as 75 per cent. of the whole may be credited to vessels engaged in the shipment of foreign grain to this country, chiefly by the following firms, viz., Messrs. Carr & Co., Carlisle; Messrs. Seatree & Sons, Penrith; Messrs. Irving, Maryport; and Messrs. Pattinsons & Winter, Whitehaven. Many of the species gathered are classed as indigenous to countries bordering on the Mediterranean, chiefly from Italy and the islands of Sicily, Sardinia, and Corsica. In North America, from the United States and California. In South America, from Chili, Monte Video, Rosario, and Brazil. I may note that I have not so far met with any species that can be distinctly classed as indigenous to Australia, New Zealand, or the Cape Colony. Intermingled with species of undoubted foreign origin, plants are occasionally gathered

which, though not indigenous to the North Western counties of England, are yet included in the London Catalogue of British Plants.

With the exception of the Silloth station, I am individually responsible for the lists which accompany the present notes. At Silloth I have received courteous and able assistance from Dr. Leitch of that place, who, besides his acknowledged ability as an exponent of botanical science, has the great advantage of being constantly on the spot, and able at all times to examine and report on the occurrence of anything unusual in the plant line. From the Rev. Hilderic Friend, F.L.S., late of Carlisle, I have also received useful and accurate information; and I deeply regret his departure from the neighbourhood. Last, but by no means least, I must acknowledge the ready and cheerful assistance of Miss E. J. Glaister, of Blackdyke, Silloth, and her brother, whose names must be associated in my memory with many a seaside ramble enjoyed in their congenial society. I must travel yet further afield in my acknowledgments, and express our joint obligations to Mr. J. G. Baker, F.R.S., of the Herbarium at Kew Gardens, London, for his courtesy in identifying specimens regarding which any doubts existed. His services in that respect have been invaluable, and we justly congratulate ourselves on having been fortunate enough to receive the benefit of his almost world-wide experience.

The lists which are appended to these remarks must not be considered as anything but an approximate catalogue of the species that have appeared from time to time during the last fifteen or twenty years. From the very exposed situation of the refuse heaps, it will easily be understood how readily any attractive flower would be appropriated as an addition to a child's- or grown-up person's- bouquet, and so fail to be noticed by an occasional visitor.

Nor is it to be supposed that these adventive species will (except in very rare instances) become acclimatized or established here. Take Maryport as an illustration. The ground surface there has been covered with successive layers of ballast, during the seven years of my residence at Flimby or Workington, each layer obliter-

ating probably for all time the vegetation of the preceding one. Again; the variety of the ballast matter, consisting as it does of granite, chalk or flint, sandstone, the refuse of slate quarries, clay, alluvium of divers kinds, etc., must be taken into consideration; and more important still may be the variation of climate of our northern latitudes from that of the lands from which the several substances were originally procured. It is quite reasonable to assume that but for the notice taken of them by my co-workers and myself, all record of their existence upon our coast-line would quickly have perished.

The case is somewhat different at Silloth. There the dressings from Messrs. Carr's large corn mills, consisting of what a native Cumbrian would designate as "popple," are either gratuitously distributed or sold at a nominal figure to the mill-workers and other labourers for poultry-keeping purposes. Scattered about the banks contiguous to the dwellings, the waste corn is quickly picked up by the fowls, and the residue, consisting of the smaller seeds, by and bye germinates, and the hillocks are quickly clad with vegetation of home, or more commonly of foreign origin. The few opportunities that occur to me of visiting this station, never fail to result in the discovery of some plants not previously noted.

I have gathered at Silloth the following different species classed as indigenous to some portion or other of the United Kingdom. This is probably the stage at which I may most appropriately refer to the recent alterations that have been made in the arrangement of plants in the 8th or latest edition of the London Catalogue, as compared with preceding issues. The former editions contained at the end an appendix, which embraced a large number of species considered as aliens, casuals, waifs of cultivation, etc. The great majority of these have been re-introduced by Mr. Fred J. Hanbury and his editorial co-workers. The change can hardly be classed as a popular one, and I fear that it may be productive of confusion in quarters where the science of Botany is but imperfectly understood. As, however, the members of the British Association have accepted the new order of things, I have followed their example. Many such stragglers have been found at Silloth.

INDIGENOUS TO BRITAIN.

<i>Delphinium consolida</i>	<i>Silene conica</i>
<i>Alyssum incanum</i>	— <i>gallica</i>
<i>Sisymbrium sophia</i>	<i>Allhæa hirsuta</i>
<i>Erysimum orientale</i>	<i>Malva rotundifolia</i>
<i>Camelina sativa</i>	— <i>parviflora</i>
<i>Brassica napus</i>	— <i>borealis</i>
<i>Senebiera coronopus</i>	<i>Geranium pyrenaicum</i>
<i>Lepidium ruderalis</i>	<i>Medicago falcata</i>
<i>Raphanus raphanistrum</i>	— <i>minima</i>
<i>Saponaria vaccaria</i>	<i>Melilotus officinalis</i>
<i>Trifolium resupinatum</i>	— <i>parviflora</i>
<i>Vicia lutea</i>	<i>Centaurea cyanus</i>
— <i>angustifolia</i>	— <i>caleitrapa</i>
— <i>varia</i>	— <i>solstitialis</i>
<i>Lathyrus aphaca</i>	<i>Cichorium intybus</i> (Chicory)
<i>Bupleurum rotundifolium</i>	<i>Anagallis coerulea</i>
<i>Coriandrum sativum</i>	<i>Asperugo procumbens</i>
<i>Caucalis daucoïdes</i>	<i>Anchusa sempervirens</i>
<i>Peucedanum sativum</i> (Parsnep)	<i>Hyoscyamus niger</i>
<i>Galium tricornis</i> (Rev. H. F.)	<i>Stachys annua</i>
<i>Asperula arvensis</i> (Miss E. J. G.)	<i>Ballota nigra</i>
<i>Xanthium spinosum</i> (Do.)	<i>Plantago arenaria</i>
<i>Anthemis cotula</i>	<i>Chenopodium viride</i>
<i>Senecio erucifolius</i>	<i>Polygonum maritimum</i>
<i>Carduus nutans</i> (Miss E. J. G.)	— <i>maculatum</i> (Rev. H. F.)
<i>Onopordon acanthium</i> (Do.)	<i>Fagopyrum esculentum</i>
<i>Scandix pecten-veneris</i>	<i>Ruppia rostellata</i> (Miss E. J. G.)
<i>Triticum acutum</i>	<i>Bromus erectus</i>
<i>Cynosurus echinatus</i>	— <i>tectorum</i>
<i>Phalaris canariensis</i>	— <i>maximus</i>
<i>Apera spica-venti</i>	

ALIENS.

<i>Echinosperrnum lappula</i>	<i>Hemizonia</i>
<i>Amsinckia lycopsoïdes</i>	<i>Phacelia</i>

Centaurea melitensis
 ——— (?)
Heracleum hirsutum
Triticum capitatum
Salvia
Sisymbrium pannonicum

Omphalodes verna
Ægilops
Hordeum barbatum
Bromus schraderi
 ——— *squarrosus*

Plants gathered at Maryport from 1884 to 1891. Included in the London Catalogue, 8th Edition, 1887.

Adonis autumnalis
Sisymbrium sophia
Camelina sativa
Brassica rapa
 ——— *nigra*
 ——— *alba*
Diplotaxis tenuifolia
Senebiera coronopus
Lepidium rudérale
 ——— *draba*
Thlaspi arvense
Raphanus raphanistrum (2)
Saponaria vaccaria
Silene noctiflora
Cerastium tetrandrum
Malva rotundifolia
Medicago denticulata
 ——— *apiculata*
 ——— *maculata*
Melilotus officinalis
 ——— *alba*
 ——— *parviflora*
Vicia angustifolia
Anthemis cotula
 ——— *arvensis*
 ——— *nobilis*
Centaurea cyanus

Anagallis cœrulea
Asperugo procumbens
Borago officinalis
Lithospermum arvense
Solanum nigrum
Hyoscyamus niger
Antirrhinum orontium
Veronica buxbaumii
Marrubium vulgare
Stachys germanica
Plantago arenaria
Amaranthus retroflexus
Chenopodium opulifolium
 ——— *urbicum*
 ——— *rubrum*
 ——— *botrys*
Atriplex littoralis
 ——— *angustifolia*
 ——— *dello-idea*
Mercurialis annua

GRASSES.

Setaria viridis
Phalaris canariensis
Alopecurus agrestis
Phleum arenarium
Polypogon monspeliensis

<i>Cichorium intybus</i>	<i>Apera spica-venti</i>
<i>Verbena officinalis</i>	<i>Bromus erectus</i>
<i>Beta maritima</i>	— <i>secalinus</i>

ALIENS.

<i>Echinospermum lappula</i>	<i>Ximenesia australis</i>
<i>Amsinckia lycopsoides</i> (California)	<i>Centaurea melitensis</i>
<i>Chrysanthemum coronarium</i>	— <i>calocephala</i>
<i>Hemizonia pungens</i> (Chili)	<i>Bowlesia tenera</i>
<i>Senecio</i> (?)	<i>Bromus schraderi</i>
<i>Rapistrum rugosum</i> (2)	<i>Neslia paniculata</i>
<i>Sisymbrium pannonicum</i>	<i>Verbascum phœniceum</i>

NOTE.—The following plants were all collected upon one mound of a peculiarly heavy and tenacious loam, which formed a part of the ballast of a ship trading to South America, and is believed to have come from the Rio de la Plata. A giant form of *Chenopodium*, which never developed flowers, and could not on that account be definitely named—but its nearest British representative is *Chenopodium album*. *Ximenesia australis*, *Bowlesia tenera*, *Medicago denticulata*, *M. maculata*, *Bromus schraderi*, *Verbascum phœniceum*, and a very pretty *senecio*, with finely divided leaves, which has not been identified.

DERWENT TIN PLATE WORKS, WORKINGTON.—Quite a different and in many ways a remarkable condition of things is apparent here. Behind the works on the east side is a large accumulation of ashes and cinders, mixed with other rubbish, forming a raised embankment four or five yards in depth, and about forty or fifty yards in extreme length. A footpath used by the workpeople passes along the southern base. During the early summer of 1889 I noticed along this track a large number of plants unknown to me previously. On inquiry at the works, I was informed that the material upon which the plants were growing consisted of refuse from the tin plate works. It came by sea from Liverpool, and, after being applied while in a heated state for imparting a polish to newly-made tin plates (on much the same principle as pins and needles are rendered bright by rapidly revolving in heated

bran), it was cast forth as worthless. So far as I have been enabled to discover, the refuse consists of shoddy or waste from woollen and flax mills, probably from south-east Lancashire or the adjacent West Riding of Yorkshire. Traces both of wool and flax are apparent here and there, but I failed to detect any appearance of cotton. Many plants are there observable which, though recognized as being British, are only seen on very rare occasions in Cumberland as adventive or casuals, though many are also of undoubted foreign origin. The season of 1889 was probably too dry for the full development of plant life on a bank of dry ashes, although the southern aspect was decidedly favourable. At any rate, the same species attained more luxuriant growth in 1890 than during the preceding season. Children destroyed a few species before identification was practicable. Others again, fell victims at an immature stage to the wild storms of October last year. The species gathered and identified during 1889 included the following plants presumably of British origin, viz :—

<i>Lepidium draba</i>	<i>Mcililotus alba</i>
— <i>ruferale</i>	— <i>officinalis</i>
<i>Sinapis alba</i>	— <i>parviflora</i> (in abundance)
— <i>nigra</i> (abundant)	<i>Trifolium fragiferum</i> , v. <i>resupinatum</i>
<i>Brassica rapa</i>	
<i>Sisymbrium sophia</i>	<i>Carduus arvensis</i> (spineless form)
<i>Raphanus raphanistrum</i> (two varieties)	<i>Anthemis cotula</i> (plentiful)
	— <i>arvensis</i>
<i>Thlaspi arvense</i>	— <i>nobilis</i> (wanting ray florets)
<i>Diplotaxis tenuifolia</i>	<i>Solanum nigrum</i> (also at Maryport)
<i>Camelina sativa</i> (abundant)	
<i>Barbarea intermedia</i> (seen only once)	<i>Hyoscyamus niger</i>
	<i>Calamintha acinos</i>
<i>Reseda lutea</i>	<i>Anagallis cœrulea</i>
<i>Silene anglica</i>	<i>Chenopodium olidum</i>
— <i>noctiflora</i>	— <i>opulifolium</i>
<i>Lychnis viscaria</i>	— <i>botrys</i> (also at Flimby)
<i>Malva rotundifolia</i> (also at Silloth)	— <i>murale</i>
	— <i>viride</i>

<i>Medicago denticulata</i> , v. <i>apiculata</i>	<i>Mercurialis annua</i>
— <i>maculata</i>	<i>Amaranthus retroflexus</i>
— <i>sativa</i>	

GRASSES (British).

<i>Cynodon dactylon</i>	<i>Bromus erectus</i>
<i>Setaria viridis</i> (also at Maryport)	<i>Echinochloa crus-galli</i>
<i>Polypogon monspeliensis</i> (very fine)	<i>Gastridium lendigerum</i>
<i>Festuca bromoides</i>	<i>Poa compressa</i>
<i>Bromus arvensis</i> (one plant)	<i>Phalaris canariensis</i>
— <i>maximus</i> (also at Silloth)	<i>Lolium linicola</i>

ALIENS, OR ADVENTIVE.

<i>Sisymbrium pannonicum</i>	<i>Centaurea melitensis</i>
<i>Erysimum orientale</i>	<i>Plantago arenaria</i>
— <i>hypericifolium</i>	<i>Saponaria vaccaria</i>
<i>Trigonella polycerata</i>	<i>Brassica</i> ?
— <i>corniculata</i>	<i>Silene inaperta</i>
<i>Trifolium lappaceum</i>	<i>Lycopersicum esculentum</i> (tomato)
<i>Ammi bisnaga</i>	<i>Amaranthus alba</i>
— ?	<i>Nicotiana tabacum</i> (tobacco)
<i>Senecio vernalis</i>	

GRASSES (Aliens).

<i>Panicum capillare</i>	<i>Setaria glauca</i>
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Additional Plants gathered in 1890. Reputed British species.

<i>Trifolium incarnatum</i>	<i>Medicago sativa</i>
<i>Blitum virgatum</i>	<i>Cichorium intybus</i> (chicory)

GRASSES.

<i>Glyceria maritima</i>	<i>Bromus squarrosus</i> (very fine)
<i>Lolium perenne</i> , v. <i>ramosum</i>	<i>Lolium temulentum</i>
<i>Agrostis spica-venti</i> (abundant)	

ALIENS, OR ADVENTIVES.

<i>Malcolmia maritima</i>	<i>Mentha requiem</i> (I. of Corsica)
<i>Arabis retrofracta</i>	<i>Trifolium</i> , allied to <i>T. maritimum</i>
<i>Silene linicola</i> ?	from N. America
<i>Artemisia scoparia</i>	<i>Verbascum phœniceum</i>

FOREIGN GRASSES.

<i>Panicum</i> —?	<i>Eragrostis verticillata</i>
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From the above list, embracing as it does about ninety distinct species (exclusive of varieties), those not reputedly of exotic origin being all more or less rare in the north-west of England, it will be readily concluded that the task of identification would have exceeded my capacity, had it not been for the experienced aid already referred to in this paper. I can most fully endorse the following remarks by Dr. F. Arnold Lees, F.R.C.S., of Leeds, contained in a note in the appendix to his excellent and comprehensive "Flora of the West Riding of Yorkshire" (1888):—"For those who want a downright good botanical puzzle, and a rousing lesson in plant character by the way, these foreign weeds answer admirably. It is only necessary to purchase a stone or two of *hen-corn* at different mills, strew it at intervals in spring on waste garden ground, allowing the fowls a few minutes to pick the wheat, and in a few short weeks—*voilu!* a parterre more bewildering to the lover of the botanically curious in its variety than it is possible to attain otherwise with so little trouble."

I may just notice in passing, that upon heaps clearly consisting of household rubbish or sweepings, I have found the following species associated. viz:—*Linum usitatissimum*, *Phalaris canariensis*, *Cannabis sativa*, and less commonly perhaps *Amaranthus retroflexus*. At Flimby, Risehow, Maryport, and at the Derwent Tin Plate Works, Workington, they have been observed in conjunction—but the last mentioned was also seen upon the shoddy, and independent of home origin. I infer that such refuse came from dwellings where feathered pets were kept, and sprang from the sweepings of bird-cages.

A remarkable illustration of the rapidity with which uncommon

species will sometimes multiply and extend themselves under peculiar circumstances, is afforded by the open beach between the West Cumberland Iron Works and the sea. Here, upon a wide expanse of shingle, consisting entirely of triturated slag from the neighbouring furnaces, the great Yellow Horned Poppy (*Glaucium luteum*) has found a congenial home, and multiplied amazingly. In 1884, probably half-a-dozen examples might have been seen; now the entire area of nearly two acres in extent is thickly over-spread with plants, and their beautiful silver-grey foliage has a most charming appearance even during the depth of winter. It is interesting further to notice the manner in which the plants are gradually creeping up the sloping bank of slag on the north side of the main station; and it is obvious that the whole shore will soon be occupied. No mention of the plant in connection with the North Shore occurs in the notes of my immediate botanical predecessors—W. Dickinson, Esq., F.L.S., of Thorncroft, or his equally observant colleague, the late Mr. David Tweddle, bank manager, of Workington. Of soil in the ordinary sense of the word there is practically none—bare grey shingle is alone visible. Towards the northern extremity a fine colony of *Echium vulgare* is noticeable, the brilliant azure flowers of which must be familiar to all summer strollers over Silloth banks.

A singular find occurred at Parton during the summer of 1889. On the strip of ground separating the railway from the sea, and in close proximity to the railway station, within a distance of about one hundred yards in length, I noticed in early summer some fifty or sixty plants, at about equal distances apart, with potato-like foliage. When the yellow blossoms appeared, they too seemed to connect the plants with the Nightshade family. Not, however, until the fruit developed to considerable size, did it dawn upon me that the plants were veritable Tomatoes (*Lycopersicum esculentum*). How the plants came there remains unexplained. I have mentioned elsewhere that a solitary Tomato plant was seen on the shoddy bank at Derwent Tin Plate Works during the same season.

In bringing these remarks to a conclusion, allow me briefly to refer to a singular side issue which has been raised in connection

with the find at the Derwent Tin Plate Works in 1889. I had made some reference to the discovery in course of a conversation with my friend Mr. H. Thompson, F.R.C.V.S., of Aspatria, the energetic Secretary to the Directors of the Aspatria Agricultural College; and he was anxious to know the degree of heat to which the material would be exposed, when in use at the Tin Plate Works. On inquiry, I was told that no reliable record was kept, but that approximately I might take the extreme as ranging from 85° to 90° Fah. The question was then started as to what amount of heat some of these necessarily very minute seeds—those of *Mentha requiem* for example—were calculated to sustain without injury to their germinating power. Mr. Thompson, who is president for the year of an association of his professional brethren, at their annual meeting held in Edinburgh, made incidental reference to the facts communicated to him by myself. He was asked by a gentleman present—Mr. Phillips, an army V.S. attached to a cavalry regiment stationed at Jock's Lodge Barracks, Edinburgh—whether the seeds might not have been wind-blown from plants in the immediate neighbourhood of the Tin Plate Works. The president's reply distinctly negatived the suggestion; whereupon Mr. Phillips replied that, taking into account the heat and friction described without injury to the germinating powers of the seeds, it was not unreasonable to suggest that the bacilli of anthrax might be contained in cotton cake, surviving the heat and pressure employed in the manufacture or preparation of the cake from the seeds of the cotton plant. The question thus raised remains for decision experimentally or otherwise.

On the other hand, singular instances are not wanting to show that seeds retain their vitality unimpaired under circumstances of a most unfavourable nature. In the summer of 1852, the second year of my residence at Aspatria, the season was exceptionally dry, and the large pond known as Brandraw was sufficiently reduced in bulk to allow of the bottom being cleared of twenty years' accumulation of mud and sludge. This was laid aside against an adjoining wall until it should become sufficiently solidified to admit of its being carted away for agricultural purposes. In an incredibly

short space of time the entire surface became covered thickly with young grass. The species were never identified, as the material was removed before the flowering spikes became visible. A yet more remarkable instance is recorded in the Linnean Society's Transactions, some three or four years ago, when a short paper was read before the members to the following purport. Shortly before the date of the paper referred to, the River Avon Navigation Commissioners effected considerable improvement in the channel towards Bristol, by dredging the bed of the river. An old quarry-hole of considerable extent adjoined the river, and into this handy receptacle the mud was tipped until the excavation was made level with the surrounding surface. No sooner was it sufficiently indurated by the escape or evaporation of the water, than the top was overspread with vegetation of a miscellaneous character, mostly, however, of exotic origin, and bearing a striking resemblance to that found about Silloth. The port of Bristol is some centuries older than Silloth, and it is impossible to imagine how long some of the mud thus brought to the surface may have remained undisturbed at the bottom. The similarity in species of the plants collected at these two widely separated stations leads to the inference that grain importation is probably the common origin of both. The matter is worthy of further thought and investigation.

NOTES ON A BOX USED IN SMUGGLING ON
THE BORDER FIFTY YEARS AGO.

By T. V. HOLMES, F.G.S.

(Read at the Maryport Annual Meeting.)

Two years ago (being then President of the Geologists' Association of London) I arranged with Mr. J. G. Goodchild for a week's excursion of the Association to north-west Cumberland and Edenside. But before leaving London it occurred to me to make some provision against wet weather during the stay of the Association at Carlisle by taking various books and maps, and by drawing up a short paper in which I noted certain differences between the aspects of things in south-eastern and in north-western England. I commented, in the first place, on the results of geological structure in their influence on the scenery of the two regions, both as regards their effect on the landscape generally and in the nature of the trees which were most abundant. In a typical Kentish landscape, for instance, the Elm (*Ulmus campestris*) is the characteristic tree, while in Cumberland this Elm is rare, its place being taken by the Wych Elm (*Ulmus montana*), the Oak, and the Ash. I then noticed the comparatively grim and unadorned villages and churches of Cumberland as indicating the very late date at which the county had begun to enjoy anything like material prosperity, pointing out that an Act of Parliament to check moss-troopers had been passed so late as the reign of Charles II. Since the failure of the insurrection of 1745 a more settled state of things

had existed; but Hutchinson, writing about a century ago, had many passages (some of which I quoted) showing either the backward condition of agriculture in certain districts, or the very recent date of important improvements.

I added that though mosstrooping might be considered to have become extinct about a century and a half ago, successive governments had, since its extinction, practically endeavoured to keep alive a law-breaking spirit by the creation of smuggling between England and Scotland. This almost incredible piece of folly had been achieved by the exaction of very different amounts of excise duty on certain commodities north and south of the Border, and was bearing evil fruit when Sir Walter Scott denounced it in *Redgauntlet* about the year 1825.

But I found on talking over the matter with some members of the Geologists' Association, that they were inclined to be more or less sceptical as to the former existence of smuggling between England and Scotland, thinking either that I had somehow mistaken Sir Walter Scott, or that Sir Walter had taken a romancer's license. And I could point to no writer who had treated of the subject but the great novelist.

Feeling the desirability of obtaining corroborative evidence, I called on an aged and respected citizen of Carlisle, who was also an old friend of my own, knowing that he would be able to aid me in some way. After some talk on the subject he produced a box, which he kindly gave me, and which he said had been used in smuggling about the year 1842. It is a square wooden box, about $9\frac{1}{4}$ inches long by $7\frac{1}{4}$ inches broad, externally, and about $7\frac{1}{4}$ inches deep. The lid is fastened down by four screws, and would consequently take some little time to open, a work that could have been done only with care and deliberation. Inside the box is a small keg, capable of holding half a gallon of whiskey. The space between the exterior of the keg and the lid of the box was filled with small pebbles, which alone would be visible on the partial loosening of one or more of the screws. While, if merely seized and shaken by an exciseman, no sound would be heard but the rattling of the pebbles. And we can hardly doubt that to the revenue official of

fifty or sixty years ago, a collector of stones must have seemed a necessarily harmless if somewhat feckless person, incapable of anything so manly as smuggling whiskey. This barrel, I am informed, never held anything but whiskey at 9s. per gallon, the duty being 10s.

My friend's name I do not give, lest some slur should seem to attach to it in the eyes of a younger generation of Cumbrians, to whom opportunities of amateur smuggling are unknown, except on the occasion of a visit to the continent. From some notes which he copied from his notebook and sent to me after I had left Carlisle, I learned that salt, as well as whiskey, had at one time been subject to a much higher excise duty in England than in Scotland. In the year 1822 a man named Harding, of Great Corby, was shot by an exciseman named Forster, while endeavouring to smuggle three stones of salt in order to cure his pig; an incident which may have had some influence in causing the great reduction of the salt duty in 1823. Whiskey, however, remained in its old position in spite of a desperate affray which took place on Eden Bridge in 1824 between smugglers and excisemen, followed a few days after by one hundred and twenty informations against publicans for selling smuggled spirits; a fact which testifies in the most unquestionable way to the immense demand in Carlisle for whiskey at Scottish prices. Yet more than a quarter of a century was to elapse before the equalisation of the excise duty on spirits on both sides of the Border, an event which happened in 1852 or 1853.

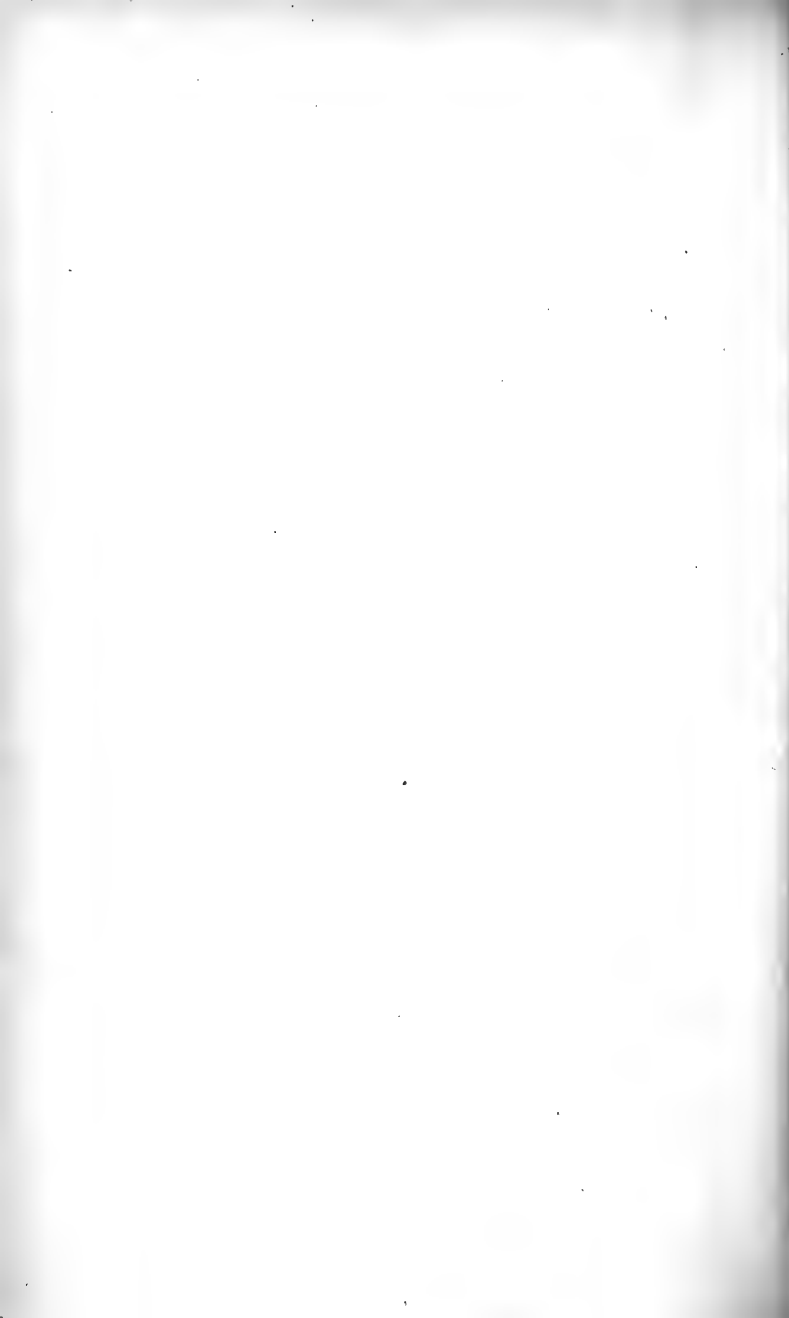
Perhaps in few matters has necessity more often been the mother of invention than in smuggling. To turn for a moment to south-eastern England. In a letter to the *Hastings Observer* dated November 15th, 1880, and headed "Reminiscences of Old Times," the writer, Mr. E. Wenham,* relates that between 1820 and 1830 smugglers at Hastings were detected in one case landing kegs of spirits hidden in what were apparently blocks of sandstone; while in another instance kegs were concealed in lumps of chalk. On the south-eastern coast, however, smuggling was wholly carried

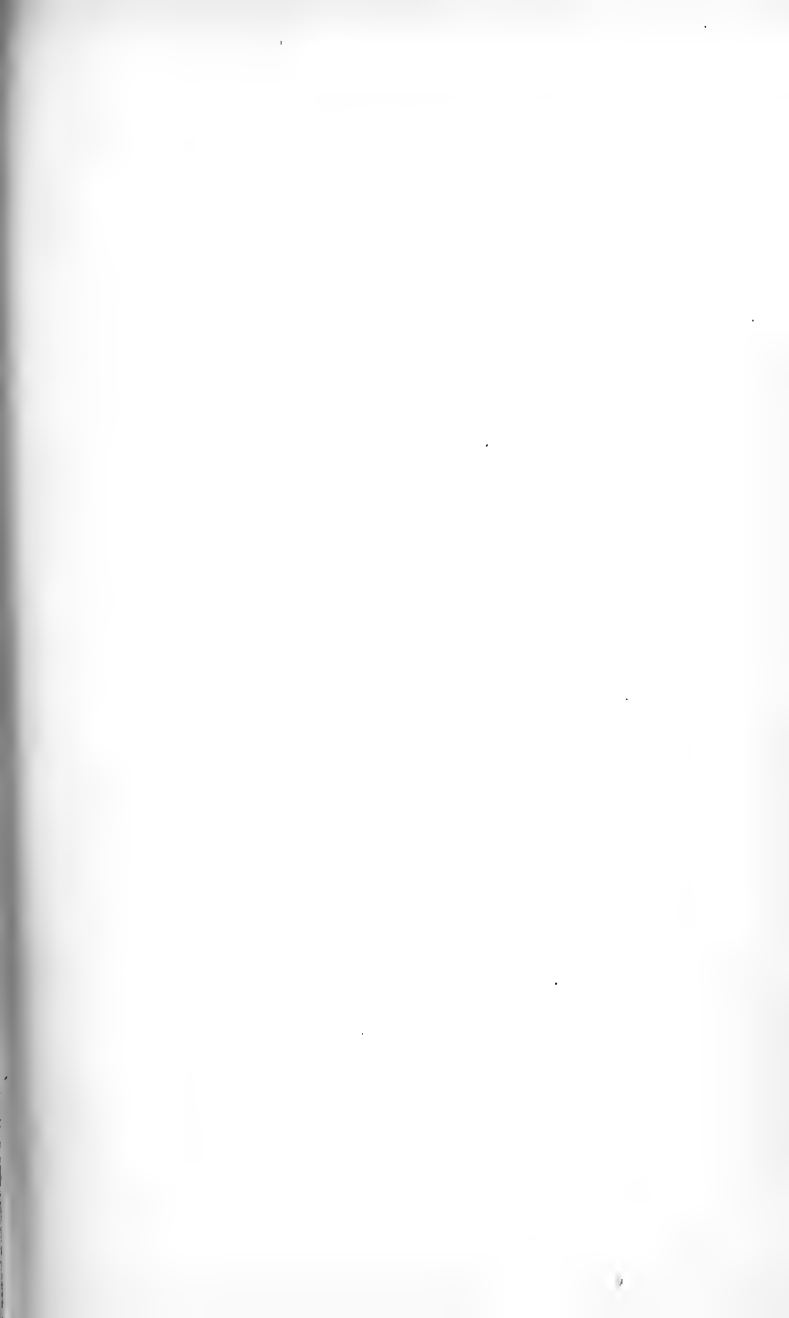
* Mr. Wenham lived most of his life at Greenwich, and was well known to me.

on by professional men for purely commercial purposes, for we can hardly dignify the squires, farmers, and others who were glad to receive good brandy at a low price, and to remain in ignorance of its previous history, as amateurs. That title must remain for those who, like the former owner of this box, smuggled mainly from a love of adventure tinged more or less by desire to demonstrate the folly of an enactment which prevented the purchase of whiskey at a reasonable price at Carlisle or Wigton, and allowed it at Gretna or Annan. But as it is obvious that the genuine amateurs risked more in person, though not in purse, than the professional Trumbulls and Nanty Ewarts, it is evident that inventive ingenuity must have been active in their protection. Admirably designed as this box appears to be to accomplish the purpose for which it was made, the noble army of amateurs could never have trusted with safety to any single pattern. The same result must have been attained in so many different ways as to prevent the exciseman from regarding with special suspicion receptacles of any one particular make. I therefore hope that a result of the publication of these notes may be to induce some resident of this Border district to collect and lay before this Association the whole of the available evidence bearing upon Border smuggling, both as regards its extent and the various contrivances of those engaged in it either as professionals or amateurs. In a very few years all smugglers of both classes must have passed away.

It may be suggested, perhaps, that the Cumberland Archæological Society should be the recipient of communications of this kind rather than this Association. I do not know what the rule of the Archæological Society may be as regards the period dealt with in a paper, but the London Society of Antiquaries excludes all material less than a century old; a regulation which doubtless, on the whole, works well. I think besides, that in matters like Border smuggling, Gretna Green marriages, pack-horse traffic, etc., which have become extinct during the present century, the inquirer who will do the best work in collecting information from the oldest inhabitants will not do it as the result of his superior archæological knowledge, but rather as a consequence of his knowledge of men

and women, and of the way to obtain the greatest amount of information from those most competent to give it. He will proceed, in short, as Mr. Rawnsley did when collecting the materials for his delightful paper giving the opinions entertained of Wordsworth by the people of the Lake Country who in various ways came into contact with the great poet. But as it is evident that Mr. Rawnsley would have been too late had he waited another ten years, so will it be with the collector of reminiscences of Border smuggling, which expired about two years after the death of Wordsworth. And I believe that Cumberland will be found to offer a more interesting field of research than any other English county, to those who are qualified to obtain information from the oldest inhabitants, about old manners, customs, and folklore ; information of which people fifty or sixty years of age, living in the same districts, may be entirely destitute.





Bands of sedimentary rock interstratified with andesitic tuff, No. 2 showing the elongation of the fragments of lava along the cleavage planes. From Yew Crag Quarry, near Buttermere.

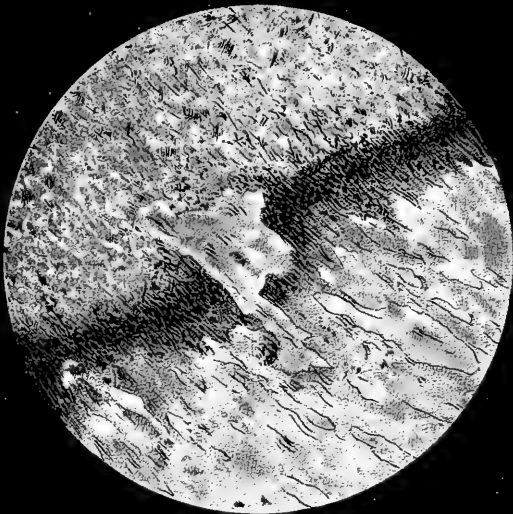
(1) Section parallel to the plane of cleavage. ²⁹

(2) Section in a plane at right angles to the cleavage.

J. G. G. 12/10/91.



Nº 1.



Nº 2.



THE CLEAVED ASHES
AND BRECCIAS OF THE VOLCANIC SERIES OF
BORROWDALE.*

By J. POSTLETHWAITE, F.G.S.

(Read at the Maryport Annual Meeting.)

THE rocks known as the Volcanic Series of Borrowdale occupy an oblong area, which stretches across the Lake Country in a north-easterly and south-westerly direction. This area measures about thirty-four miles in length by twelve miles in width, comprising about four hundred square miles; on the north-west it is bounded by Skiddaw Slate, except where it abuts against the Buttermere and Ennerdale Syenitic Granite. On the north-east, it is succeeded partly by Carboniferous Limestone, partly by Conglomerate, and partly by Skiddaw Slate. The south-western boundary is formed partly of St. Bees Sandstone, partly of Eskdale Granite, and partly of the Skiddaw Slate of Black Combe, and the south-eastern margin is formed of Coniston Limestone. This area contains several lakes, some of the highest mountains in England, and the most varied and beautiful scenery that can be found in the British Isles.

The volcanic rocks of the Borrowdale series consist of ashes and

* The Rocks of the Volcanic Series of Borrowdale, as well as those belonging to other formations in the Lake District, have been described and illustrated in a very full and able manner in the Memoirs, Maps, and Sections prepared and published by the former Editor of these *Transactions*, the late Rev. JAMES CLIFTON WARD, F.G.S., and I have to acknowledge my indebtedness to his works in the preparation of this and other papers.

breccias, alternating with sheets of lava; the whole being traversed by dykes and masses of igneous rock. Of the last named, two masses, namely, the Ennerdale Syenitic Granite and the St. John's Quartz Felsite are on the course of the fault which separates the volcanic rocks from the main area of the Skiddaw Slates, and it is probable that the fault was the channel through which the materials composing these masses welled up from beneath in a molten state, not to the surface, but into huge caverns formed by the folding and crumpling of the strata, which took place during the earth movements that produced the fault. The condition of the quartz which constitutes an important part of nearly all the igneous rocks of the district, proves that they were solidified under great pressure, and at a considerable depth beneath the surface.

The Ennerdale Syenitic Granite occupies an area of about twenty square miles, extending from Buttermere on the north, to Wastwater on the south. The rock is generally of a pale red colour, sometimes changing to dark grey, and it is fairly uniform in appearance. It consists of pink felspar (plagioclase and orthoclase), dark green hornblende, and transparent quartz. Usually it is very hard, but on the mountain tops it is much decomposed, often crumbling into a coarse sand.

The St. John's Quartz Felsite is exposed in two masses of about equal size, they occupy both sides of the lower end of the vale of St. John, and are, in all probability, connected beneath the alluvium which forms the floor of the valley. The masses each measure about a mile from north to south, and from half to three-quarters of a mile from east to west. The colour of the felsite is generally light grey, but in some places it assumes a reddish tint. It consists of microcline and orthoclase felspar, quartz, calcite, and schorl; also some epidote and serpentine, part of the last named has probably replaced mica. The rock is usually well jointed, and contains large fragments that have been much altered.

The Eskdale Granite is the largest exposure of igneous rock in the Lake District, covering an area of about thirty-five square miles. It lies at the south-western margin of the area occupied by the volcanic series, and is succeeded on the western side by New Red

strata. Generally the rock is rather coarse, but in some parts there are bands of fine-grained granite. It consists of quartz, orthoclase and triclinic felspar, and dark brown mica; in some portions of the fine-grained granite the mica is absent. The felspar is more or less impregnated with hematite, which gives a reddish tint to the rock, and that tint is more apparent on a weathered surface than where it has been recently fractured, as the hematite, when liberated from the decomposed felspar, overspreads the whole surface of the rock. There are also three small exposures of granite, which are in all probability connected with the Eskdale mass, namely, at Burnmoor Tarn, at the foot of Wastwater, and foot of Scawfell. The first named is rather coarse, and the two latter fine-grained, but all have the reddish tint which characterizes the Eskdale Granite.

On the opposite margin of the volcanic series, near Shap, there is a much smaller, but in some respects a more interesting exposure of granite. The rock consists of a base made up of grains of white felspar, crystalline quartz, and black mica, in this base are embedded large oblong crystals of pink felspar (orthoclase), which are often of gigantic size, and form the distinguishing feature of the granite. It is much altered where it is in contact with the surrounding rocks, the latter also being greatly metamorphosed. The mass, as it now exists, measures about two miles in length by one and a quarter in width, but it has suffered greatly by denudation, multitudes of boulders of all sizes being scattered over the country to the south and east of the parent mass, some of them having been carried to a distance of sixty miles from their original home.

On Seatollar Fell, Borrowdale, there is a dyke of diorite lying between two masses of intrusive diabase. The masses of diabase together measure about three-quarters of a mile in length by about a quarter of a mile in width. The rock is very compact, and of a dark blue colour; it consists of a felsitic base, in which there are crystals of triclinic felspar, quartz, augite, and some magnetite. The diorite, which is much altered, is made up of numerous small crystals of felspar, hornblende, magnetite, and chlorite. The dyke is about one-third of a mile in length, and forty or fifty feet in width.

It is in connection with these masses of blue diabase, and the dyke of diorite, that the rich deposits of plumbago have been found.

There is a small exposure of diorite on Swirral Edge, Helvellyn. The rock is very hard and compact, and consists of small crystals of plagioclase and orthoclase felspar, augite, and magnetite, also a few scattered cubes of iron pyrites.

The Armboth Dyke is a quartz felsite, being precisely the same in chemical composition as the St. John's Quartz Felsite. It is a very beautiful rock, consisting of a dull red felsitic base, studded with numerous crystals of pink felspar and transparent quartz, also a little serpentine, and occasional grains of green mica. The dyke is from twenty to thirty feet in width, and extends in a NN.W. and SS.E. direction across Armboth Fell, where it may be traced for a distance of about one and a half miles. It appears again on the opposite side of the valley, near the seventh milestone on the road from Keswick to Ambleside, and extends in a S.E. direction beyond the crest of Helvellyn.

There are several branching dykes stretching across the upper part of Langstrath valley, in Borrowdale. The rock of which they are composed consists of crystals of felspar embedded in a felsitic base. There is a good deal of chloritic matter disseminated through the base, which also contains some augite, magnetite, and pyrites. Occasionally the mass is traversed by veins of red felsitic material. There are also dykes on Scafell, Kirkfell, Watendlath Fell, and others of minor importance.

The sheets of lava that are interstratified with the ashes and breccias of the volcanic series, are mostly very hard and compact, of a grey or bluish green colour, and they often contain crystals of augite, quartz, calcite, and other minerals. The best section of lavas and ashes to be found in the whole series occurs on the eastern shore of Derwentwater, extending from the margin of the lake to the summit of Bleaberry Fell. In this section there are twelve distinct sheets of lava, which vary in thickness from fifteen to one hundred and fifty feet, the upper and under surface in each case being more or less vesicular and cinder-like, while the remainder is massive and compact. One of the number, which

occurs about the middle of the series, differs considerably from the rest ; it was originally extremely vesicular throughout, but the vesicles have since been filled with quartz, calcite, and a dark green or blackish earthy mineral, the product of decomposed augite. Small, but beautiful, specimens of agate, carnelian, and jasper are frequently found in this lava. It is easily recognized owing to its distinctive features, and may be traced a considerable distance. Numbers of small fissures have been formed in some of the lavas, and these have been filled subsequently with chlorite, epidote, quartz, calcite, and other minerals. Some of them are also very much jointed, and break into irregular and splintery fragments.

There is a series of lava flows exposed on Eycott Hill, near Berrier, much smaller, and less important, than the series on Bleaberry Fell, but one of the former is a very handsome rock, containing large crystals of felspar, sometimes more than an inch in length. Single sheets of lava may also be seen a little to the east of Stanah, in St. John's Vale, and at the back of Lodore hotel, Borrowdale. The former contains numerous crystals of augite, but the latter, which is very compact, contains no crystals that are visible to the naked eye.

The ashes and breccias compose the largest portion, probably nine-tenths of the rocks of the volcanic series ; they are alike, in being formed of materials that have been ejected from volcanoes, but differ with regard to the size of the fragments they contain. The ash, properly so called, varies from a rock containing fragments of the size of walnuts, which is considered a very coarse ash, to a rock formed of fine impalpable powder. Breccias are of all degrees of coarseness, from rocks formed chiefly of fragments about the size of walnuts, to those in which they measure five or six inches across ; but there is one locality on the north-east of Base Brown, near Sourmilk Gill, where the breccia contains huge blocks several yards in diameter, In both coarse ashes and breccias the fragments are generally angular and unworn at the edges, but in some rare instances they are water-worn like a conglomerate. In colour the ashes and breccias vary from dark green to light grey, or sometimes purple. The green tints, which are very prevalent,

are due to the presence of chlorite diffused through the rock, in a greater or less degree, the red and purple tints being due to hematite.

There is generally more or less stratification discernable in the ashes, shown in some cases by clearly defined bands of light and darker colour, and in others by fine and coarser materials. These alternating beds or layers of finer and coarser ash are often very irregular, some layers thinning out and others thickening; and occasionally very clear examples of false-bedding are seen amongst the finer varieties. Sometimes a single fragment of older rock of considerable size, showing all its original structure, may be seen embedded in a mass of fine ash.

The materials of which the coarser ashes and breccias are formed, consist chiefly of fragments of older ashes and lavas, but in the purple breccia, at the base of Falcon Crag or Bleaberry Fell section, which is probably the oldest member of the volcanic series, there are numerous fragments of altered Skiddaw Slate. The fine ash has no doubt been formed of the same material as that which is sometimes ejected so copiously from modern volcanoes when in a state of activity, and which is merely lava reduced to powder by a succession of violent explosions of steam and gas; indeed, the ashes, breccias and lavas of the Borrowdale series afford abundant evidence in their structure and composition that they were derived from a similar source, and in a similar manner to the beds of recently formed volcanic ejectamenta which may be seen surrounding the cone of an active volcano.

All the rocks of the volcanic series, as well as the underlying Skiddaw Slates, have been subjected to great lateral pressure, caused in all probability by the shrinking of the earth's crust in cooling; and this pressure, which acted in a N.E. and S.W. direction, has produced cleavage in a higher or less degree in nearly all the beds of both these formations, by causing them to expand in a direction perpendicular to that in which the pressure was applied, the particles constituting the rock being flattened and rearranged during the process, with their longer axis in the direction in which the expansion was made. This change in the structure of the rock causes it to split readily across the old planes of stratification at a

more or less oblique angle. Apart from the cleavage, the effect produced on the two formations has been very different, the Skiddaw Slates, being less able to resist the pressure, are much contorted and crumpled, except where the soft beds are interstratified with beds of grit; while the hard volcanic rocks have merely been thrown into a series of low curves. Most of the dykes and masses of igneous rock probably owe their origin to the earth movements which caused the contortion and cleavage. There is, however, a notable exception in the case of the quartz felsite dyke on the summit of Kirkfell, which is highly cleaved, while the adjoining ash beds are not so. Cleavage is very highly developed in some of the beds of ash and breccia, while in others, with which the highly cleaved beds are in contact above and beneath, it is very imperfect. This difference appears to be due in some cases to the finer quality of the material of which the highly cleaved beds are formed, but it is not always so, because the beds that are made up chiefly of fine materials are not uniform throughout, but have in them, here and there, portions that are very coarse, and in these coarse portions the cleavage is often as perfect as where the material is of the finest quality. There is, moreover, a marked want of uniformity in the cleavage in beds where it is most perfectly developed. The beds may sometimes be traced for a great distance by certain well defined bands of colour, and in some parts of their course cleavage has been developed in its greatest intensity, and large quantities of slate of the best quality are obtained from it, while in the adjacent parts, on each side, the cleavage is so imperfect, that it will not yield slate at all. The same irregularity would, no doubt, be found in following the beds downwards that has already been proved to exist in tracing them horizontally, but it has yet to be ascertained. On the surface, the highly cleaved portions of a bed occur at uncertain intervals, and measure from fifty to two hundred and fifty feet in diameter, the vertical and horizontal measurement being much the same; and if a series of bore-holes were put down on the dip of the bed, by means of the diamond borer, they would in all probability reveal the same irregular succession of perfectly and imperfectly cleaved patches in following it downwards. The

whole of the phenomena connected with slaty cleavage point to the conclusion that the highly cleaved beds were in a more plastic condition than the overlying and underlying strata when the lateral pressure which caused the cleavage was applied to them, and that those portions of the cleaved beds where cleavage occurs in its greatest intensity had yielded sufficiently to the pressure, while the remainder had only yielded partially.

There are two beds at the base, and seven or eight beds near the top of the volcanic series, in which there is more or less slaty cleavage, but in all the middle portion of the series, with the exception of one place, near Eagle Crag, in Borrowdale, it appears to be altogether absent. The beds at the base have been, and are now being, worked in Borrowdale and near Buttermere; and those near the top of the series, at Walna Scar, Coniston, Tilberthwaite, Elterwater, Langdale, Rydal, Grasmere, Kentmere, and Cawdale Moor. The Borrowdale and Buttermere quarries yield about three thousand five hundred tons of slate per annum, and give employment to about one hundred and twenty men; and the Westmorland and Lancashire quarries yield about four thousand tons per annum, and give employment to about two hundred men, thus constituting one of the most important industries in the Lake Country. The slate obtained from these quarries is unrivalled for beauty, strength, and durability. In the two latter qualities it is greatly superior to Welsh sedimentary slate, but it has the disadvantage of being slightly heavier; the best quality of green slate yields four slates to the inch, and one ton will cover about thirty-two square yards of roof.

The two beds of fine cleaved ash, called locally, "slate metal," which occur at the base of the volcanic series, lie parallel to the great fault which separates that series from the Skiddaw Slates, the strike of the beds agreeing to a considerable extent with the strike of the fault, the lower bed being about one thousand or one thousand one hundred feet from it. The general dip of the slate metal also coincides with that of the fault, and of the underlying and overlying beds, being about thirty degrees towards the south-east; the direction of the cleavage planes is nearly vertical. The beds of

slate metal may be traced along the outcrop, from Bouldering End, by Rigg Head and Honister, to near Scarf Gap, at the head of the vale of Ennerdale; beyond these points they no doubt have an extension westwards towards Egremont, and eastwards towards Mellfell, but in these portions cleavage is very slightly developed; indeed, the true slaty cleavage occurs only between the igneous masses of St. John's Quartz Felsite and the Ennerdale Syenitic Granite, and, it is probable that the increased lateral pressure caused by the irruption of these masses may have assisted materially in producing the requisite amount of cleavage. Trials have been made at several points along the outcrop of the beds, but the slaty cleavage is insufficiently developed, except at Rigg Head, Honister, and Dubs. A little slate has been obtained from the quarries at Castle Crag and Dubs, but all the other trials appear to have been unsuccessful. The two beds are from fifty to sixty yards apart, and the lower or northern one is about sixteen feet in thickness, its upper and under surface being clearly defined. The upper or southern bed is much thicker, but not so well defined. The former has been worked extensively in the quarries at Honister Crag, and the latter at Yew Crag, on the opposite side of the pass. Honister Crag has been pierced by ten, and Yew Crag by six levels, some of which are from one hundred to one hundred and twenty fathoms in length. The united length of the levels on both sides of the pass is near three miles; and the tramways in use in these levels, and from the levels to the head of the pass, where the slate is discharged, including the tramway to Dubs quarry, measure about six miles.

The beds of "slate metal" from which the slate is obtained in these quarries is composed chiefly of fine ash, but at irregular intervals layers occur that are much coarser, and occasionally fragments of older rock of considerable size are found embedded in the fine ash. Near the top of the upper or southern bed there is a thin band or stripe of very fine and compact ash, of a pale purple colour, varying in thickness from three-quarters of an inch to one-and-a-half or two inches. The lower edge of the band is more clearly defined than the upper edge, the material is also finer

and the purple colour more intense near the lower edge. The cleavage planes are almost invariably more or less deflected in passing through the band, and like the colouring and texture of the slate, the deflection is most acute at the lower edge. After carefully examining and comparing a large number of specimens from various parts of Yew Crag quarry, I was led to conclude, so far as I dared to do without microscopic examination, that the deflection in the cleavage planes, together with the altered colour and texture of the slate, were probably due to vertical pressure, to which the bed had yielded subsequently to the period when cleavage was developed.* For the purpose of obtaining clearer evidence on this point I had some slides prepared from the band, and Professor Bonney kindly examined them for me, and gave permission for his notes on the slides to be printed as an appendix to my paper. Mr. Goodchild also kindly made drawings of two of the slides, which are annexed hereto.† The result of Professor Bonney's examination being unfavourable to the theory of metamorphism produced by vertical pressure, it would seem, therefore, more probable that the deflection in the cleavage planes has been caused by the abrupt passage from very fine to somewhat coarser materials. The fine dust of which the red band is composed (especially the lower part of it) appears to have been impregnated with an unusually large amount of ferric oxide, while there has been a corresponding diminution in the quantity of chloritic colouring matter which is so prevalent in the adjoining beds.

Rigg Head quarry has been worked thirty years or more, in the same beds as Yew Crag, Honister, and Dubs quarries; extensive excavations have been made and a considerable quantity of slate of good quality has been obtained from it.

* *Note by the Editor.*—When this paper was read I expressed to Mr. Postlethwaite my opinion that these dark purple bands were not due to metamorphic action, as he then supposed; but were simply bands of the same sedimentary material as that composing the Skidda Slates; and a careful examination of the slides under the microscope when drawing them for the annexed figures, has confirmed that view.

† I am greatly indebted to Professor Bonney and Mr. Goodchild for the valuable assistance they have so kindly rendered in these matters.

Some of the beds of ash and breccia beneath the two beds of slate metal are sufficiently cleaved in places to yield slate. The most important of these is the breccia worked at Queyfoot quarry, which lies about midway between the lower bed of slate metal and the base of the volcanic series. It has yielded a large quantity of slate of fairly good quality, although somewhat heavier than that obtained from the beds of slate metal above. It has also yielded, and is still yielding, an abundant supply of strong, durable, and very beautiful building stone.

In the rocks on the north east of Ladder Brow, and just above the road between Lodore and High Lodore, there is a disused quarry from which some slate has been obtained; this quarry is in the basement bed of the volcanic series. The great fault skirts the base of the rocky escarpment all the way from Lodore waterfall, to the head of Troutdale; and although it is not exposed immediately beneath the quarry, the latter cannot be more than about forty or fifty feet above it.

In Langstrath valley, Borrowdale, about half a mile south of Eagle Crag, there is an old quarry of considerable extent. The bed of ash from which the slate has been obtained at this place is near the middle of the volcanic series, and it would seem that it is the only point, either in this or the adjoining beds, where cleavage has been sufficiently developed.

In the upper part of the volcanic series there are seven or eight distinct beds which yield slate in large quantities; they are all much alike in quality, the slate being somewhat finer than that obtained from the older beds in Borrowdale. In thickness the beds vary from ten to one hundred and twenty feet, and the dip is towards the south-east, except in some places where it is changed by the curving and crumpling of the strata. A case of this kind occurs on the northern side of Little Langdale, where the dip is towards the north, and at Pennyrigg quarry, near Tilberthwaite, where the bedding planes are vertical. Slaty cleavage has been well developed at a great number of points in these beds, extending from Cawdale quarry, on the north-eastern side of Kirkstone Pass, to Walna Scar, about three miles south-west of Coniston. A large

number of quarries have been opened, and extensive excavations made, especially at Loughrigg, Elterwater, Hallgarth, Moss Rigg, Hodge Close, Tilberthwaite, and Saddle Stone; the last named is at a high elevation on Coniston Old Man. In some of the quarries, notably those worked by the Elterwater Green Slate Co., and the Tilberthwaite Green Slate Co., powerful and well equipped steam and hydraulic machinery has been erected for the purpose of raising the slate from the deep portions of the quarries, also self-acting and other tramways. Rock-drills and air-compressors have been introduced into the quarries of the Elterwater Company, and good results have been obtained by their use. Most of the slate obtained is of the bright sea-green colour which is so prevalent in the rocks of the volcanic series; but in some localities the chloritic colouring matter is absent, and the slate is grey or drab. Narrow bands of still lighter colour, sometimes almost white, pass through it, and occasionally these light and darker portions are contorted and intermingled together in an extraordinary manner; they are also often broken up and shifted by miniature faults; and not infrequently specimens may be found showing false-bedding and ripple-marking.

In the uppermost beds of the volcanic series the fine ashes are mixed with water-borne sediment, and there are beds of moderately pure ash interstratified with beds of equally pure aqueous sediment. The more or less pure ash retains its characteristic colours of green or drab, but the sedimentary beds are much darker; in some places they have a purple tint, and in others are almost black. Some roofing slate is obtained from the dark beds, but generally the material is more suitable for flags.

The beds of cleaved ash near the top of the volcanic series are more in number, they are also in most cases much thicker, and slaty cleavage extends over a much greater length along the outcrop, than in the slate-producing beds at the base of the series. In the latter the distance between the two extremities of the slate-producing area does not exceed seven miles, while in the former it measures thirteen miles. The beds in the upper part of the series are parallel to, and occupy the same relative position with regard to

masses of intrusive igneous rock as those at the base of the series ; the latter stretch between the St. John's Quartz Felsite and the Ennerdale Syenitic Granite, and the former between the Shap Granite and the southern part of the Eskdale Granite ; and it is highly probable that the irruption of the igneous masses, in both cases, may have assisted in producing slaty cleavage in the beds which lie between them. A line drawn on the map from Elterwater to the southern end of Eel Crag marks the centre of the area in which slaty cleavage occurs in both the upper and lower beds ; and similar lines drawn from Walna Scar to Scarf Gap, and from Cawdale Moor to Lodore waterfall, mark the south-western and north-eastern boundaries of that area. Extending these lines forward beyond the points named, they form a junction at Greenbanks, near Cockermouth, and enclose a triangular area having for its base the outcrop of the Coniston Limestone, and its apex the farm of Greenbanks. This triangle, therefore, encloses the rocks that were subjected to the maximum of pressure during the earth movements by which cleavage was caused.

APPENDIX.

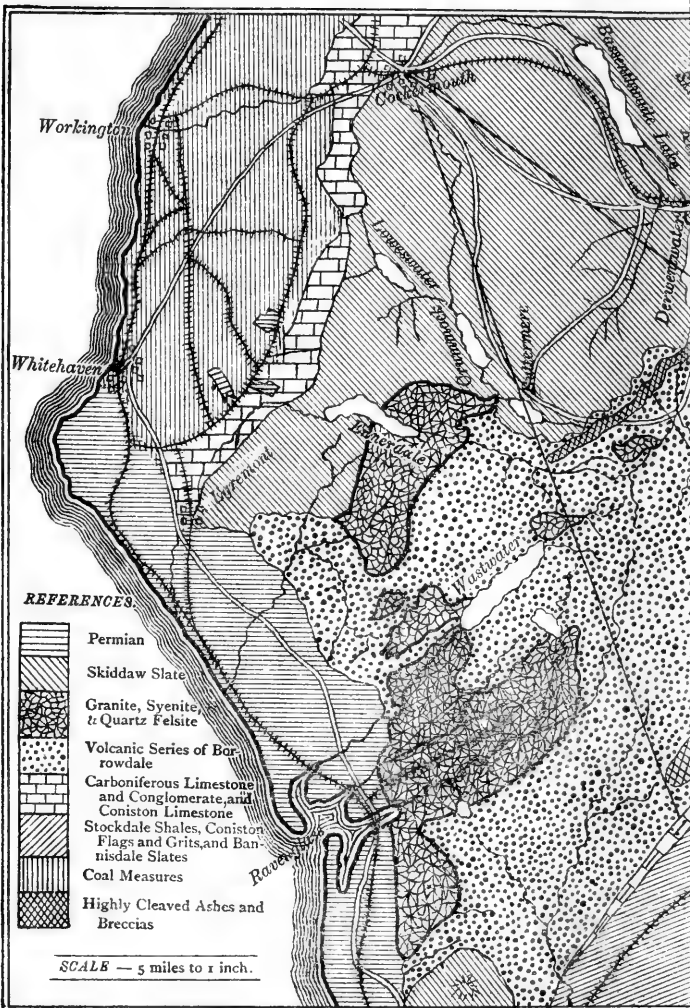
*On the Structure of some Volcanic Ash from the Borrowdale Series,
by Professor Bonney, D.Sc., LL.D., F.G.S., F.R.S.*

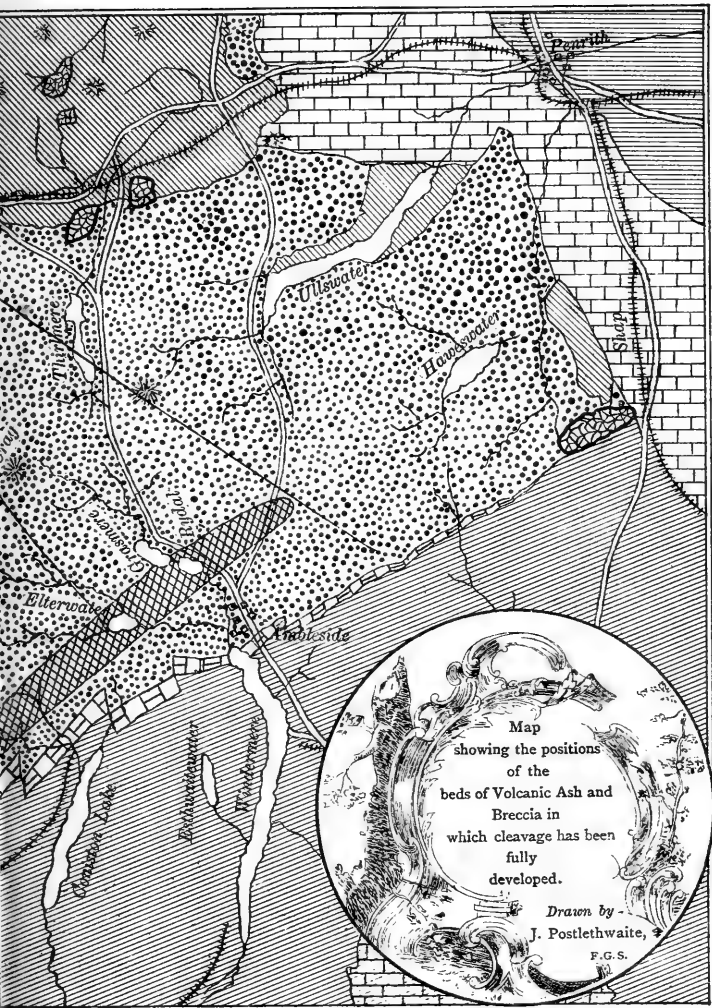
No. 1 and the coarser part of the other slides consist of small mineral and rock fragments, angular and subangular in outline, and seldom exceeding '03" in longest diameter, commonly rather less. The majority of the mineral fragments were evidently felspar. All are more or less altered, being replaced by a filmy mineral which gives bright tints with crossed nicols and by thin lines of viridite (this may result from infiltration). A minute description of the changes is needless, for there is nothing unusual. A few fragments are wholly or almost wholly replaced by viridite : these

may have been a pyroxenic mineral. Of the rock constituents, part is blackish opacite, exhibiting here or there a felspar microlith, no doubt a fragment of scoria; part shows frequent felspar microliths, fragments probably of andesite; part is earthy, barely translucent, and practically without effect on polarized light, very probably decomposed glass. With these viridite is interspersed. I think the materials are not water-worn. The rock, in short, is one of the ordinary fine-grained volcanic grits or rather coarse slates, with secondary micromineralogical changes. The red band consists of much finer materials, so that the discrimination and identification of the constituents is much more difficult; but I have no doubt it is a volcanic dust or mud. The finest part of it changes rather abruptly into the ordinary coarser rock, though one or two fairly large fragments lie (boulder-fashion) in it, and here is a zone or streak of darker colour. On the other side it passes more gradually into the coarser rock. The slide cut transverse to the plane of cleavage, shows that both the coarser and the finer fragments are compressed and elongated in the usual way. I cannot see any signs of a disturbance later than the date of the cleavage.

T. G. B.

SEUM
1872







NOTABILIA OF OLD PENRITH.—PART II.

BY GEORGE WATSON.

(Read at Penrith.)

AFTER reading my former paper on "Notabilia of the Old Town of Penrith" (*Transactions*, No. XIV., 1888-9), it occurred to me that the few notes I then made of citizen life in the old town—mainly derived from the old churchwardens' book—might be advantageously extended by research in the Parish Registers; and having made the attempt, the present paper was read at Penrith last Session.

In the interim, however, between reading this paper and revising it for publication in the *Transactions*, further investigation has thrown new light upon some of the subjects, and in such cases I have not hesitated to amend the text accordingly.

Each successive vicar appears to have kept the registers himself, or to have been responsible for them; I will therefore notice them under the respective vicars' names.

MR. WILLIAM WALLEIS.

The first vicar the register makes us acquainted with is Mr. William Walleis, who held the living from 1575 to 1601, i.e., from the 17th to the 43rd year of Queen Elizabeth.

The registers really commence in 1556, in the reign of Queen Mary, of sanguinary memory, William Walleis having with commendable assiduity preserved all entries from that date, probably on paper, fast becoming illegible, which, with his own entries, he

copied on to parchment in the last two years of his twenty-six years' incumbency. This we learn from the headings he has given to the two first pages of his work, in large Old English characters. The first page is headed in Latin, meaning a "Book of Registers of Penrith, written in 1599, in the 41st year of Queen Elizabeth." There is nothing further on this page properly relating to the registers, but the otherwise blank space has been filled with some miscellaneous notes to which I will refer presently. The second page has also a heading in similar Old English characters, as follows: "A Trewe Copie of the Register Booke of Penrith, of all Christenings, Marriages, and Burialls, beginning in the year of our Lord God, 1556, written (on) parchment;" and under this is written in small letters, and with a different ink, "By me, William Walleis, vicarius quonda," i.e., at one time vicar; making it clear that William Walleis added this record after he had ceased to be vicar of Penrith.

I will notice a few of the earliest entries, to show that some familiar personal names of this day were in existence in Queen Mary's time. "1656, last day of May, Niclas (Nicholas) Apulby and Katherine Emetson, was married." "Robert Goodburn and Isabel Watson married;" and from that time to the present century the name of Goodburn has been continually turning up in the register. "Rolland Atkinson and Grace Bartram married." "William, son of Henry Simpson, buried."

The difficulty of reading these early registers is considerable, owing to the antiquated style of writing, the capricious spelling, and, worst of all, the faded ink. The names of Railton, Roper, Pattinson, Hewer, Bowerbank, Winder, Nelson, and Carleton occur from the earliest to modern times. The name of Hutton is, of course, of frequent occurrence. Some of these entries evidently relate to the ancient family of Hutton Hall, Penrith, but other Huttons of more plebian families are also numerous. The brevity of the entries of the early registers—neither ages being stated nor, as a rule, occupations mentioned—renders the bulk of them of no special interest. The only guidance we have in identifying families is in the use of the prefixes—Sir, Mr., and Mrs.; and in the

affixes—knight, squire, or gentlewoman. The prefix “Mr.” may mean a gentleman of position, or a clergyman holding a University degree. In latter times, “Mr. is applied to attorneys-at-law and to leading tradesmen. “Mrs.” does not necessarily mean a married lady or widow, it is applied also to young unmarried ladies of the better class. The prefix “Sir” was formerly applied to a clergyman who had not taken a University degree. William Walleis never gives himself the title of Mr., nor does he call himself Sir, as I see in some lists of vicars he is so styled. Readers of Shakespeare will call to mind *Sir* Hugh Evans, the Welsh Parson in “The Merry Wives of Windsor.” This custom of designating the inferior clergyman “Sir,” is said to have given rise to the practise of knights, after using the prefix “Sir,” adding the affix “knight” or “baronet,” to distinguish themselves from the poor parsons.

Occasionally in the registers we are treated with tit-bits of information on spare spaces, or on margins, sometimes running into the other writing, for the old men were wonderfully economical in the matter of parchment and paper. On the first page of the register book, below the heading, we find “Proper nots (notes) worth keeping, as followeth :—Flodden Field was in Anno Dom. 1535.” The writer was evidently afraid that English History might not record the fact. Other similar well-known events are noted. One “proper not,” however, touches a matter in local history worth special notice. “Commotion in these north parts, 1536.”

“ASKE’S REBELLION.”

This brief note refers to the great rising in the time of Henry VIII., known as “Aske’s Rebellion,” and also as the “Pilgrimage of Grace,” when the popular mind was roused to rebellion by the priests, who were opposed to the King’s notions of Church Reformation, especially that part of it which consisted of the spoliation and robbery of monasteries and chantries. This great rising prevailed all along the eastern side of the island, in Lincolnshire, Yorkshire, Durham, and Northumberland, and as far west as Penrith, where the measure would create indignation by

the confiscation of the revenues of Bishop Strickland's Chantry at Penrith Church.

Chancellor Ferguson, in his recently published *History of Cumberland*, speaking of this rising, says:—"The Act of 1536 for the suppression of the smaller religious houses affected all the religious houses in the county but those of St. Mary's, Carlisle, and of Holm Cultram. This excited much discontent, and 'Aske's Rebellion,' or 'The Pilgrimage of Grace,' found local sympathisers in the Abbot of Holm, the Chancellor of Carlisle, the Prior of Lanercost, and the Vicar of Penrith, who busied themselves in collecting men at Penrith and sending them to the insurgents at York." Penrith would be a convenient centre where bodies of men could be massed and marched over Hartside to the Tyne Valley, thence to join the main body of insurgents in the east. When I was a small boy, in my native county, Durham, we used to repeat some strange doggerel lines running thus:—

Roberty, Boberty, big fat hen,
Ate the Church and all the men,
He ate the Church, ate the steeple,
He ate the parson and all the people ;
Roberty, Boberty, big fat hen.

This grotesque doggerel lingered in my memory for sixty years before it struck me that it was a relic of a seditious song of the "Pilgrimage of Grace." "Robberty, Bobberty" was, I think, originally Robbery, Robbery; the big fat hen was the corpulent Henry the VIII., and the big fat hen's voracious appetite for things ecclesiastical was a burlesque of the fat King's absorption of monastic and chantry revenues, with which he filled his own and his courtiers' pockets. I wonder if the original of "Roberty, Boberty" was sung in Penrith when, as the "proper not" quaintly says:—"There was commotion in these North parts, 1536." Other notes may be passed over, for English History has evidently pirated them and made them common property.

THE PLAGUE.

Near the bottom of the page we find this note:—"A sore plague in Richmond, Kendal, Penrith, Carlisle, and Appleby, and

other places in Cumberland and Westmorland in 1598; of this plague there died at Kendal ——” Here the rest of the information is eaten away by vermin, which is greatly to be regretted, as it might possibly have explained the dubious record on the old stone tablet, afterwards copied on to the brass plate now on the wall of the north chancel aisle of Penrith Church, to which I will refer presently.

The average number of deaths at Penrith for a year in William Walleis' time was about 50; but in 1585-6-7, the number rose to 79, 105, and 196 respectively; then for six years fell to 50 again, only to rise in 1597-8 to the frightful magnitude of the great plague at Penrith, alluded to in the note on the first page of the register. In 1597, September 22, there is this entry:—"Here began the plague, God's punishment, in Penrith." This is followed by an explanation that "all who died of the infection are noted with the letter P, and all who were buried on the Fell, with the letter F," and this notation was systematically carried out, except that after a short time the word "Fell" is written in full. Amongst the early victims were five Railtons and four Hewers, after which the names indicate that every family in the town paid its fatal contribution. During the fifteen months of the pestilence, I find 687 deaths in all, of which 662 are noted with the ominous letter "P," leaving only 25 to be set down to ordinary causes. This may, perhaps, be accounted for by the supposition that many enfeebled or diseased persons who would have died in the ordinary course of things were ready victims to the pestilence. Of the 662 plague victims, only 213 are noted as being buried on the Fell, leaving 450 as buried in the Churchyard, Schoolyard, and in some few cases in private yards. The term "Fell" to some may require explanation. It must be understood that all the Beacon and Beacon Side above Brent House Grounds, the top of Arthur Street, and Mr. Robert Scott's house in Wordsworth Street, were then, and for 300 years after, all open Common, called Fell, and the place where tradition says the plague victims were buried was behind a barn which stood, as many will remember, about the top of Mr. Robert Scott's ground. Why so large a proportion of plague victims were buried in the

town is extraordinary, and cannot be explained by supposing that the Fell was only resorted to as a late expedient, the fact being, as the notation in the register shows, that burying in the Churchyard and on the Fell went on simultaneously.

During this terrible time the register was kept with the utmost regularity, no gaps are to be found in it, it is a perfect day by day record of the ravages of the pestilence, and must be taken as an authentic enumeration of the number of victims, being, as I have stated, 662. How then, is the number 2,240, given on the brass plate in the Church as having died at Penrith, to be accounted for? The thing was impossible, seeing that a parish with an ordinary death rate of 50, and birth rate of 60 in the year could not well have contained that number of inhabitants. The only feasible supposition, and the one generally accepted, is that the number 2,240 represents a large district having Penrith as a centre. The pestilence was at the worst in the months of July, August, and September, when 115, 104, and 102 died in these months respectively; the greatest number in any one day, according to my investigation, was 19. One of the entries of burial not marked with the fatal P is this:—"Margaret, the daughter of Willm Seatree buried chappelle." By which I think it must be understood that the burial took place in the chancel, then known as St. Mary's Chapel.

The 27th of November afforded a unique experience in the life of William Walleis, for on that day he, while the pestilence (although abating) was still claiming its victims, united William Dobson and Mabel Dobson in the bonds of holy matrimony, and same day buried John Winder and Ann Winder, his wife, both in one grave, and opposite the entry are placed the two fatal P's, indicating that they were victims of the plague. Amongst the earlier victims we find the wife and son of the vicar, who thus, as the previous registers show, is for the third time a widower; not for long, however, for on the 8th day of December, the pestilence having almost disappeared, we read this entry—"William Walleis, vicar, was married to Dorothy Machell by Sir John Knott."

Mr. Walker, in his *History of Penrith*, writing on the "plague,"

says, "Not a solitary marriage is registered all the summer." My investigation is somewhat different, I find that during the first four months of the visitation there were 17 marriages, equal to the average number for a year, and with the exception of the two months of March and May, there were some every month; and that during the fifteen months of the pestilence and the three months succeeding there were 55 marriages, being at the rate of 36 per annum, as against the normal average of 16. The result, no doubt, of the bereaved of both sexes hastening to console each other at the altar.

The three years following the plague show a great increase in the number of marriages and baptisms, while the burials only average 28 for a year. The latter may perhaps be accounted for in two ways, the survival of the strongest and the diminished population, resulting from the abstraction of upwards of 600 inhabitants, in a little over a year, from a probable population of 2,000.

SCOTTISH MARAUDERS.

Another kind of plague, from which Penrith had long suffered, was the incursions of Scottish marauders, who infested Cumberland and Westmorland, thieving and killing with impunity; and no sooner had the plague disappeared than the Scottish land pirates made their appearance in greater force than ever. William Walleis's register gives a pitiable account of their depredations in the years 1600 and 1601, which may be seen in *Dixon's Charities*, published 1820.

The last entry William Walleis makes in his book of registers is to the effect that after having been vicar of Penrith for twenty-six years, he is vacating the living for Thursby, near Carlisle. Let us hope that in the twenty-two years he is known to have spent at that place, he had better fortune in his domestic relations, and enjoyed such happiness as compensated him for the heavy domestic and parochial troubles he had gone through at Penrith with the courage and endurance of a hero. William Walleis was succeeded by Mr. John Hastie.

JOHN HASTIE, VICAR.

Mr. Hastie commenced his register with a memorandum of his induction, thus :—" Mr. John Hastie, M.A., was inducted Vicar of Penrith, April 28th, 1601, in the presence of Mr. Anthony Page, steward, and Mr. Thomas Atkinson, and many others." Close to this, and squeezed into the margin, is a note, " the brewing lead was all cut to pieces by the Scots soldiers to make bullets of." This is a little perplexing. If the depredators were really the Scottish soldiers in time of war, Mr. Hastie was going a good way back in history, but if he referred to the Border thieves of his own day, he was really too complimentary in dignifying the miscreants with the title of " soldiers."

This Mr. Anthony Page, who witnessed John Hastie's induction, must be the person mentioned in my former paper in connection with Sandford's story of the visit of a strange antiquary, when Mr. Page was schoolmaster as well as steward of the Manor, between 1581 and 1591. It will be remembered that Mr. Page and others were invited to sup with the stranger at the Crown, and discuss the ancient monuments in the churchyard. Mr. Page was evidently a man of importance in Penrith. I have traced him in the registers, and find that in 1586, when he was schoolmaster, his marriage is thus recorded :—" 1586, June 12th, Anthony Page and Isabella Lancaster were married at Mardell Chapel by Parson Burton." Four of his children, Ann, Grace, Anthony, and Elizabeth, were baptized before the year of the plague, and in that terrible year his son Edmund was born, and his wife and son Anthony carried off with the plague. Mr. Page's burial is registered in 1623. Mr. John Hastie was a native of Catterlen, and from his time to the end of the last century, the name of Hastie frequently occurs in the Penrith registers. Mr. Hastie's wife died in 1607, after which he married Grace Page, the daughter of Mr. Anthony Page, she then being eighteen years of age. During John Hastie's time Penrith Vicarage saw eighteen births and eight deaths.

A YEAR OF EXCESSIVE MORTALITY.

In 1623, the registers show a year of excessive mortality, but whether it was another outbreak of the plague, or epidemic of another character, no word of hint is given; in this year the normal annual death rate of 50 rose to 239; there were two cases of burying "on the Fell," but the reason assigned for the exceptions is ecclesiastical, rather than sanitary. The entries stand thus:—"August 29th, Lanc Wood, being excommunicate, buried on the Fell. September 5th, Richd. Gibbon, being excommunicate, buried on the Fell." As a contrast to the ravages of disease of this year, it may be worth noting that during the year of the great plague of London, 1665, and for the years immediately preceding and following, the mortality at Penrith was below the average, being 48, 42, and 45, for the years respectively, instead of 50.

John Hastie's incumbency was a long one; commencing two years before the death of Queen Elizabeth, he saw the reigns of James I. and Charles I., and although ejected during the Puritan Revolution, he lived on until the dawn of the restoration of Monarchy and Episcopacy.

MR. HASTIE'S EJECTION.

At what date John Hastie's ejection from the living took place there is no direct evidence. In my former paper, judging only from the old churchwarden's book, which commences in 1656, I ventured the opinion that Roger Baldwin, the Presbyterian, had only lately superseded the old vicar, but in the additional light of the parish registers, I find that surmise was incorrect. Students of history will remember that the Monarchy was rudely dethroned and Episcopacy abolished in 1645, when Commissioners, called "Triers," were appointed to eject all clergymen from Church livings who refused to accept the new form of Church government and religious worship, or were in their opinion unfit by character or infirmity of age to be ministers. Of the time when John Hastie was "tried" by the Commissioners there is no record. It may be that like the apocryphal Vicar of Bray, he assented to the new state of things, and so retained his living until the infirmities

of age afforded the "Triers" a reason for his ejection. When that took place is uncertain, but the parish register book, if it does not settle the point, at least throws considerable light upon it. On the fly leaf of the register book is found a formal memorandum of the age of John Hastie. It stands thus:—"A true copy of the age of Mr. Hastie, Vicar of Penrith, set down here July 2nd, 1650." "The 27th day of January was baptised John Hastie, son of William Hastie, of Catterlen, Anno Dom. 1575." "Witness the register book of Newton per me, Jacobum Pearson, Minister." Observe that John Hastie is here (July 2nd, 1650) styled "Vicar of Penrith," indicating that he was at that date still vicar. Had he then been ejected, it would surely have styled him "late vicar." That this formal record of the old vicar's age was a factor in the process of his ejection by the "Triers" can hardly be doubted, and it is further significant that (as the Rev. Mr. Whitehead informs me) the leaf of the Newton register, containing the original of the entry, copied into the Penrith register book, has been abstracted, probably for evidence before the Triers.

ROGER BALDWIN, THE PRESBYTERIAN VICAR.

Turning to the registers of that time we find that Roger Baldwin was in Penrith with his family, as shown by this entry, "1650, June, the 9th day, Willm. the son of Mr. Baldwin bapt." Now, it is certain that the name of Baldwin never before occurred in the Penrith registers, but that it was the real Roger Baldwin is proved by an entry fifteen months later, when another little Baldwin is baptised as the daughter of Mr. Roger Baldwin. I submit then that the memorandum dated July 2nd, 1650, in which John Hastie is styled "vicar," and the baptismal registers showing that Roger Baldwin was resident in Penrith in that year, is good evidence that John Hastie's ejection was in 1650. It may be of no great importance, perhaps, to prove this, but at least it shows how parish registers may sometimes help out history.

THE REGISTERS DURING THE COMMONWEALTH.

The registers during the Commonwealth, unlike those of many parishes, were continued without interruption or change of form,

but with a marked difference as to marriages. From 1649 to 1654, the number of marriages recorded for the year was only from three to five, after which they ceased altogether until the Restoration in 1660. This is accounted for by the historical fact that Parliament had instituted secular marriages before a magistrate, and had finally abolished marriages in churches altogether; the banns were still published in the church preparatory to the civil marriage, but no record of such publications appears to have been kept. Nine years after the date I have supposed John Hastie to have been ejected, there is this entry; "1659, June 6, Mr. John Hastie, late Vicar of Penrith, buried." He would then be eighty-four years of age.

THE RESTORATION AND MR. SIMON WEBSTER, VICAR.

The year of the Restoration, 1660, brought Roger Baldwin's occupation of the living of Penrith to an end. During that year the re-establishment of the Episcopal Church proceeded apace. On the 13th September, an Act was passed and received the royal sanction, for restoring some ministers to their places, and under this Act John Hastie would have been restored had he been alive. As we have seen, he had then been dead fifteen months, consequently all the historians who have stated that John Hastie was restored, have been in error. After passing this Act, the King immediately published a proclamation re-establishing the old bishops who were still living, and appointing others to the vacant sees, amongst whom was Dr. Stern, to Carlisle; and on October 4th all the bishops assembled at Westminster Abbey. *Knight's History of England* says:—"For twenty years there had been no display of capes and surplices in the services of cathedrals, the young had never heard organs and choral services." Pepys, the prince of diarists, was there, and in his quaint style tells how "the bishops assembled in Westminster Abbey, all in their habits; but Lord (he adds) at their going out how people did most of them look upon them as strange creatures, and few with any kind of love or respect." On the 20th of the same month, Mr. Simon Webster, the newly-appointed Episcopalian Vicar of Penrith, was inducted, and recorded

the fact in the register book by squeezing into the margin the brief note that on October 20th, Mr. Simon Webster was inducted into the vicarage of Penrith. Then immediately we see once more marriages crowding into the register. Next was passed the cruel and persecuting Act of Conformity, by which all Presbyterian and Independent ministers in the possession of Church livings, who, on St. Bartholomew's Day, 1662, refused to conform to Episcopal Church government and liturgy, were to be ejected. The result was, on that day two thousand ministers went out into the world with no visible means of subsistence. At Penrith, Roger Baldwin had already been ejected under the Act of September, 1660, so that on the momentous St. Bartholomew's Day, Simon Webster, the Episcopalian Vicar, nothing loth, had only to go through the form of reading the required declaration in the Church and recording the event in the registers in these words:—"1662, August, the 24th day, being St. Bartholomew's Day, was the declaration contained in the Act for Uniformity, together with the certificate, read in the Church in time of divine service by Mr. Simon Webster, Vicar."

Simon Webster held the living only two years, and was followed in rapid succession by Robert Fisher, Charles Carter, Marius de Assigney, a Frenchman, and Joshua Bunting, whose combined incumbencies covered only nine years.

The French Vicar made a radical change in the form of the parish registers by adopting separate books for marriages, baptisms, and burials, instead of the mixed registration which had before been practised.

MR. JOHN CHILD, VICAR.

Succeeding the five clerical birds of passage, a vicar was collated in 1670, who was destined to remain at Penrith many years. This was Mr. John Child, who recorded his induction in the registers, not by squeezing half-a-dozen words into the margin, as Simon Webster had done, but by making a prolix record of the important event, formally signed by four churchwardens and seven other parishioners.

Mr. Child greatly improved the form of registration by adding the Christian name of mothers in baptismal entries; and in those of burials by adding "infant," "young maid," "young man," or other designations, giving an approximate idea of the age of the deceased. Mr. Child was a man of exactness and extreme neatness in the keeping of the register. I should judge him to have been near-sighted. His writing is so small and his lines so close that while an ordinary writer gets about three hundred words on a page of foolscap, he gets 1,000 or more.

THE BURIAL IN WOOLLEN ACT, 1678.

It was in Mr. Child's time, in the reign of Charles II., the most insane Act of Parliament that ever was passed came into operation, by which all persons burying their dead were required to wrap the corpse in "wooline," the legislature thinking by this foolish enactment to bolster up the declining wool trade. The attempt was futile for the purpose intended, but was productive of great trouble to the clergy and irritation to the people, a heavy penalty for non-compliance being inflicted, and an affidavit and certificate that the Act had been complied with, enforced. In Mr. Child's register of burials in August, 1678, five entries bracketted together and noted in the margin "no affidavits or certificates sent. I had not the Act then. A certificate sent by me August 19th." The next entry is August 23, "Isabella Robinson, widow, buried in wooline, affidavit and certificate was brought September 5th," and then for twenty-two years, to the register of each burial is added, "affidavit and certificate sent." This foolish Act was repealed in 1699.

During the twenty-two years the Act ran, there were 1,137 burials at Penrith, out of which only in four cases was the law defied. The first was "1684, April 29, Mrs. Elizabeth Bowes, buried in linen and £5 paid to the informant and the poor." From this we learn what the penalty was, and when we take into account that £5 at that time was equal to £25 now, we see how severe was the penalty. The other cases were October, 1687, Mr. Robert Wilson; "March, 1692, Margaret Mawson, a young maid, was buried in linen, and ye penalty paid according to order;" November, 1693,

Mr. Thomas Langhorn, gentleman ; and same year, John Lowther, gentleman.

On December 10th, 1694, Mr. John Child made his last entry in the register of burials, and on the 20th in that of baptisms, and twenty days after his own burial is registered. Of Mr. Child's immediate successor and the subsequent advent of Dr. Hugh Todd, I have already alluded to in my former paper, and will only add that in 1714, during Dr. Todd's incumbency, separate register books were abandoned and the mixed form again adopted, which continued up to 1754 when a separate book for marriages was commenced as one of the results of the Marriages Act of 1753.

QUAINT ENTRIES.

Uncommon, or oddly expressed entries are sometimes met with in the registers. Thus :—

- 1662—Isabell Burn als (alias) Lucky Weel, a nickname perhaps from the sign of a public-house kept by her "The Lucky Wheel."
- 1665—One Gillbanks drowned at the Skirsgill Well.
- 1714—Matthew Varty, killed by a sudden fall, buried.
- 1717—Lancelot Hubb, an old piper, buried.
- 1719—Henry Taylor, an old man aged 105 years. (This was sixty years before ages were systematically registered.)
- 1726—William, son of Anthony Otto, a German, baptized.
- 1744—Mary Penrith, a foundling, baptized.
- 1759—Noel Josette, a French officer on parole, buried. Same year, Captain Prevot, French prisoner, buried. (French Canadian prisoners of war.)
- 1772—December 13. James Bell, a German, aged 113, buried. This very aged German, with a thoroughly British name, is certainly a curiosity. Can he be the same person referred to in a baptismal register in 1739—Mary, daughter of James Bell, a piper. If so, even at thirty-three years before his death, he must have been an ancient parent.
- 1773—April. Jane Martin, poor, aged 108.

- 1777—November 19. Elizabeth Greenhow, spinster, aged 100.
(No doubt about Elizabeth being an *old* maid.)
- 1784—Mrs. French, a widow lady and an adult, baptized.
- In 1785, we have a doubly-distinguished personage in George Thompson, rattan-catcher and pauper, buried.
- 1788—Edward Whitehead, aged 21, and Sarah Redhead, aged 26, married. (Let us hope that this union of hearts and colours proved harmonious, notwithstanding the trifling disparity of years.)
- 1772—What appears then to have been a curiosity, is a man registered as "John Hill," a Methodist, aged 85, buried.

The registers having gone on for 200 years without any perceptible break, in 1760, when Mr. John Cowper was vicar, experienced a hitch, as stated in the following memorandum in the register book :—"There are no entries of baptisms or burials from January 17th to October 5th, 1760, occasioned by Mr. Joseph Tickell leaving the curacy and going into Virginia." (Wrong, no doubt, of Mr. Joseph Tickell, but where was the vicar?)

Clockmaking is said to have been a speciality in Penrith during the last century. I find the following names of clockmakers mentioned in the registers and churchwardens' book :—

- 1712—Aaron Cheesbrough made a new clock for the church, as per churchwardens' book.
- 1713—John Washington buried. He mended clock and chimes in 1664.
- 1741—William Porthouse, daughter baptized. (He is mentioned in the churchwardens' book several times as repairing the clock and chimes up to 1765, as the Rev. H. Whitehead mentions.)
- 1757—John Porthouse, clockmaker, daughter baptized.
- 1771—John Cheesbrough, clockmaker, aged 85, buried.
- 1773—Miles Henderson, clockmaker, daughter buried.
- 1777—John Savage, clockmaker, daughter buried.
- 1780—George Porthouse, watchmaker, child baptized.
- 1790—William Porthouse, clockmaker, aged 84, buried.
- 1791—Hugh Lough, clockmaker, aged 51, buried.
- 1817—George Porthouse, aged 74, buried.

THE PATTENSONS OF PENRITH.

In the latter part of the 17th and the beginning of the 18th centuries, there were two leading men in Penrith, John Pattenson, father and son, both attorneys-at-law. John Pattenson, the elder, married Mary, the daughter of Roger Sleddel, Esq., and Susanna, his wife, April, 1672. Mr. Pattensen purchased the estate of Berks, or Breeks, in Westmorland, where his eldest son Thomas eventually resided, and from whence he came to Melmerby to marry Elizabeth, heiress of William Threlkeld, owner of the Melmerby Hall estate, and became founder of the family of Melmerby Pattensons. John Pattenson, the younger, purchased Carleton Hall and estate from the heiress of Robert Carleton, the last of his line. Now going back to the first John Pattenson, we will notice the baptismal register of his third child—

1677—June. Susanna, daughter of Mr. John Pattenson, and Mary, his wife.

Eighteen months earlier we find—

1675—November. Richard, son of Anthony Hutton, Esq., and Ann his wife, baptized.

Now following these two babies up until Richard is of the mature age of 19 and Susanna is nearly 18, let us see if we cannot get a bit of romance out of the musty old registers, which tell us as follows:—

1695—April 23. Mr. Richard Hutton, of Gale, and Mrs. Susanna Pattenson, of Penrith, were married at Salkeld by Mr. Archdeacon Nicolson.

A stolen wedding evidently, a sort of young Lochinvar affair. The Gale here given, as the gallant Richard's residence, is a small Manor and Hall on the Fellsides near Melmerby, then belonging to the Penrith Huttons. Now, from what we have seen of the Pattensons of Penrith, the pretty Susanna was no mean match for a Hutton of Hutton Hall, but it can be readily understood that the venerable aristocrats of Hutton Hall thought otherwise, and banished poor Dick to the Gale, with the expectation that the

Helm wind would cool his love for the fair Susanna. But love laughs at locksmiths and sometimes even mocks at stern parents, and Susanna (at least, I fancy so) suddenly remembered a pressing invitation from her old schoolfellow, Dorothy, at Great Salkeld, to pay a long visit, and went accordingly. The thought that she would be a few miles nearer to Dick, poor fellow, might have some influence with her in coming to that decision. This, of course, was long before the days of rural posts and post cards, but it was not long before a little bird whispered in Dick's ear that somebody was at Salkeld, and as Dick, like young Lochinvar, could boast that along all the Fellsides "his steed was the best," he rode off "all unarmed and rode all alone." He had no need to swim the broad Eden, even if the flood were out, for Langwathby Bridge had lately been finished and opened to the public. (How the progress of civilisation does knock romance out of time!) I need not tell you how soon our young Lochinvar arrived at Salkeld, nor repeat all the soft nothings when there, but I will venture to tell that he stabled his steed that night at Carlisle instead of the Gale, and returned next day, not unarmed as he went, but provided with legal and ecclesiastical authority to wed the fair Susanna, which mandate was duly obeyed by the rector, Mr. Archdeacon Nicolson, the future Bishop of Carlisle. That must be true you know, because the Penrith register says so. If Richard took his bride up into the teeth of the Helm wind, he did not keep her there long, for the registers in due time inform us of their residence at Penrith. Let us hope that the stern parents relented, and received the bride with open arms; and, say you, lived happy ever after. Alas, no! That is only in story books. The inexorable parish registers say different. This is what they tell us:—

1696—July. Susanna, daughter of Mr. Richard Hutton and Susanna his wife, baptized.

1698—February. Anthony, son of ditto, ditto, baptized. Same year, November, Anthony, son of ditto, ditto, buried.

1700—February. Susanna, daughter of ditto, ditto, buried. Same year, William, son of ditto, ditto, baptized.

1701—William, son of ditto, ditto, buried.

1702—June. Mary, daughter of Mr. Richard Hutton, baptized.
And then, alas! on the 30th of the next month (July),
Susanna, wife of Mr. Richard Hutton, buried.

In 1706 a new wife comes upon the scene. In May, "Addison, son of Richard Hutton, Esq., and Bridget his wife," is baptized; and same date, "Bridget, wife of Richard Hutton, Esq.," is buried. (This is sad, indeed.)

1715, and again another wife. In June, "John, son of Richard Hutton, Esq., and Barbara his wife," is baptized.

Then a daughter, Barbara, is baptized in 1716, and on May 10, 1717, Richard Hutton, Esq., is buried, and a month later baby Barbara is buried. Richard Hutton died at the early age of 41. He was High Sheriff for Cumberland in 1710, and his name stands in the church books as churchwarden in 1701 and 1702. Of the son John, nothing more is heard. He must have died young, since his half-brother, Addison, was sole survivor, who lived to manhood, and was a doctor of medicine. He sold his ancestral estate in 1734, to Mr. John Gasgarth, whose son sold it to the Lowthers; and Addison Hutton dying in 1742 without issue, the long line of Penrith Huttons became extinct.

THE COOKSONS OF PENRITH, MATERNAL ANCESTORS OF WM. WORDSWORTH, POET LAUREATE.

A notable citizen family, were the Cooksons of Penrith. They first appear in the registers with the regular recurrence of established families in 1639, about which time the names of William, Lancelot, and Anthony Cookson, frequently occur as family men. There were, however, Cooksons in Penrith forty years before, as appears by the following entries in the parish registers:—1597, Janet, wife of William Cookson, buried; 1599, William Cookson and Elizabeth Cookson, married; and 1600, William Cookson, "tincler," buried. It is not improbable that this ancient "tincler," *i.e.*, brazier (for tin plate, the material of the modern "tinker," was then unknown) was the father of the three later Cooksons, William, Lancelot, and Anthony, but if so, it would appear that they had left Penrith as boys and returned as married men, there being no mention of them

in the registers in the *interim*. The descendants of William, Lancelot, and Anthony are so mixed up in the registers as to make it difficult to trace with certainty the genealogies of some of them, the entries being of the briefest, no ages of persons buried are given, and until 1670, the names of mothers were not stated in baptismal registrations; and then, as increasing the difficulty no little, for some years during the Commonwealth, marriages in churches were abolished, and civil contracts instituted, of which no registration has been preserved; then again the number of William Cooksons is perplexing: between 1639 and 1742, no less than six William Cookson's appear in the registers as fathers of families.

The William Cookson first mentioned, 1639, was no doubt the churchwarden of that name in 1556, when, during the Commonwealth, Roger Baldwin, the Presbyterian, was Vicar of Penrith; the second William Cookson, who by strong circumstantial evidence, was son of the Presbyterian churchwarden, had by his wife Alice six sons and two daughters, and was the immediate ancestor of the principal Cookson family; this second William appears to have inherited his father's Presbyterian proclivities, for we find his name and that of his wife Alice, amongst others in the register book as being excommunicated for nonconformity, but notwithstanding this, his childrens' names appear regularly in the baptismal register, with the exception of one daughter omitted, and one son erroneously entered by the same name as his brother Joseph.

All the children of William and Alice having been born before the passing of the Toleration Act of 1689, baptism at Church was in their case inevitable, notwithstanding the Nonconformist principles of the parents.

It is to this family I now ask your attention, since from them, by his mother's side, was descended William Wordsworth, Poet Laureate.

In the middle and latter part of the last century, there were two William Cooksons, first cousins, both leading citizens of Penrith, one a grocer and the other a mercer. The name of William Cookson, "grocer," frequently occurs in the registers as the father of ten children, and in the churchwardens' book as four times

churchwarden, and as supplying tar barrels to burn at public rejoicings, when "ale at the cross" flowed so freely at the Parish expense. William, the grocer, was son of William Cookson, eldest son of William and Alice, who in 1693 married Dorothy Fothergill, who added considerably to the already numerous Cooksons of Penrith. Dorothy died 1706, and after her there was a second wife, Susanna, whose existence, and that of her children, are only learned from the elder William Cookson's will, none of their names appearing in the parish registers. The parentage of William Cookson, mercer, maternal grandfather of Wordsworth, was for long somewhat of a mystery; dying in 1787 (when ages of persons buried had begun to be recorded in the register), he being at his death seventy-six years of age, we learn that he was born in 1711, but searching the registers of that period, no trace of him is to be found; there is the burial of a Thomas Cookson, mercer, in 1721, who might have been the father of William, the mercer, but no baptisms of any children of his are to be found.

Burke, in his *Landed Gentry* says William Cookson, mercer, who married Dorothy Crackenthorpe, was younger brother of Isaac Cookson, silversmith, of Newcastle-on-Tyne, who was born in 1680, and was a son of a William Cookson, whose family came originally from Settle, in Yorkshire, but as this puts thirty-one years between the alleged brothers, the statement looked perplexing.

All was made plain, however, by reference to the will of William Cookson, "the husband of Alice Cookson," as the parish register puts it. He died in 1712, and his will was proved at Carlisle the same year; from it we learn that he was a brazier, as was his probable ancestor, William Cookson, the "tincler" of 1600, his sons enumerated in the will stand the same as in the registers, with the exception that one of the two, erroneously registered as Joseph, turns out to be the notable Isaac, of Newcastle. The sons of William and Alice were William (also a brazier, as appears from another source), Thomas, the mercer, Joseph, who died in 1720, Isaac, the goldsmith, of Newcastle, Benjamin, and James. The old brazier's will is a most interesting document; in it he bequeaths ten shillings each to all adult members of his family and several

friends, in all twenty-four, "to buy them mourning rings. He had no great amount of money to dispose of in legacies, having generously given to each son and daughter their portion on their entering into business, or on their marriage. To his eldest son, William, he says: "I bequeath one oval table and six rushed chairs, now belonging to my dining room, one large map now in my staircase, one jack and spit, and my large Bible wherein are written the names of my several children, which legacy, together with what I settled upon him by deed bearing date the 29th day of December, 1691, is and shall be his full part and portion," etc., etc.

Another bequest is to his daughter Agnes, whose marriage in 1694, to Mr. James Coningham, is recorded in the parish registers. Walker, in his history of Penrith, says: "James Coningham, M.A., a native of Scotland, who was educated at the University of Edinburgh, and was connected with the Established Church of Scotland, is first mentioned as minister of the Presbyterian congregation in Penrith in the year 1694. In 1700 he removed to Manchester, and afterwards to London."

William Cookson thus remembers his daughter Agnes and her reverend husband in his will:—"I give and bequeath to my eldest daughter, Agnes Coningham, the sum of five pounds with one silver porringer, and ten shillings to buy a mourning ring, which, with what I gave her at the time of her marriage, is in full for her part and portion. I give and bequeath to my son-in-law, Mr. James Coningham my Clark's Bible in folio and ten shillings to buy a mourning ring." Amongst his grandchildren, to whom he left five pounds each, he mentions "John Coningham, the son of the Rev. James Coningham."

To his daughter Isabel, wife of William Jeffray, he bequeaths "twenty pounds and one silver porringer, and ten shillings for a mourning ring;" to his son-in-law, William Jeffray, "ten shillings for a mourning ring;" to his grandsons, Thomas and Richard Jeffray, twenty pounds each, and to his grand-daughter, Agnes Jeffray, the sum of ten pounds; but none of the legacies to grandchildren were to be paid until they came of age. The absence of any mention of Isabella having had a dowry on her marriage, and

the comparative largeness of the bequests to her and her children, perhaps indicate that William Jeffray had not stood so high in the testator's estimation as a son-in-law as had the Rev. James Coningham.

Amongst twelve grandchildren to whom he leaves legacies, we clearly identify "William Cookson, son of Thomas Cookson," as the future William Cookson, mercer, of Penrith, maternal grandfather of Wordsworth.

To his sons Thomas and Benjamin, he leaves small legacies, which, with what he had already settled upon them, he says, "is and shall be his full part and portion;" and to his youngest son, James (evidently not before benefitted), he bequeaths one hundred pounds, and fifty more after his mother's death." To his son Isaac he bequeaths "five pounds, and also one pound to buy mourning rings for himself and for my daughter-in-law Hannah, his wife." Also to Isaac he bequeaths "all that my dwelling house which my father purchased of Widow Ashbridge, situate lying and being in the Netherend, etc., etc., from and after the decease of my beloved wife, Alice Cookson;" in consideration of which Isaac had to pay the legacies charged thereon. The testator further provides that "all the rest of my real and personal estates, etc., etc., I give and bequeath to my loving wife Alice Cookson, and to my son Isaac Cookson, now living in Newcastle, whom I nominate and appoint executors of this my last will and testament; and it is my will and desire that after my interment a decent gravestone be procured and laid over my body with such inscription as to my executors shall seem suitable; for which use and purpose I leave to my fore-named executors the sum of two pounds ten shillings." It must be borne in mind that at that date the wages of masons and joiners were one shilling per day, and of labourers sixpence to eightpence; the cost of the tombstone was therefore equivalent to twelve or fifteen pounds at the present day.

Knowing what we do of the Nonconformist principles of William and Alice, as gathered from the parish registers and the incidents of his will, it is evident that this family were staunch Presbyterians, and accounts for the fact that many of their grandchildren were

not baptized at Church, their parents having availed themselves of the liberty given by the Toleration Act of 1689, to have their children baptized by their own minister ; and hence the dead-lock experienced in trying to trace the parentage of the poet's grandfather in the parish registers ; it also probably accounts for the error of Burke's *Landed Gentry*, in making William, the mercer, brother of Isaac Cookson of Newcastle, *instead of his nephew*.

Having enquired in the *Newcastle Weekly Chronicle* for any information about Isaac Cookson of Newcastle, goldsmith, I was favoured by a reply in the literary supplement of that journal, from Mr. Richard Welford, author of the admirable series of "Men of Mark 'twixt Tyne and Tweed," now appearing in that paper. Mr. Welford adduces some legal documents showing that Isaac Cookson of Newcastle, goldsmith, William Cookson of Penrith, and others, had been associated in carrying on iron works in the neighbourhood of Newcastle ; also that William Cookson had a close called Highfield, at Little Clifton (near Workington), in Cumberland, and had built thereon a furnace, etc., for an iron foundry, and that this private adventure of his had been merged in a company concern in which the Cooksons and certain partners carried on ironworks at Clifton, Gateshead, and Newcastle, from September, 1729. Thus it appears that William, the eldest son of William and Alice Cookson, was a pioneer in the iron trade of Cumberland and Newcastle.

Mr. Welford says, "Isaac Cookson of Newcastle, merchant adventurer, purchased considerable property and erected a spacious mansion. He was interred in St. Nicholas' church in that town, where also lie the remains of Hannah his wife, and was succeeded by his only son John, who purchased in 1745 the estate of Whitehill, near Chester-le-Street. He married Elizabeth, eldest daughter and co-heir of Thomas Ludwige, Esq., of Whitehaven, and had issue (among others), Isaac Cookson of Whitehill, who had seven sons and three daughters : 1st, John, of Whitehill ; 2nd, James, colonel in the army ; 3rd, Isaac, of Meldon Park, &c. .

WILLIAM COOKSON OF PENRITH, MERCER.

William Cookson of Penrith, mercer, son of Thomas the mercer, and grandson of William and Alice, married Dorothy Crakenthorpe, daughter of Mr. Christopher Crackenthorpe of Newbiggin Hall, Westmorland, the last but one of that ancient line, his son James (Mrs. Cookson's brother) being the last. Wordsworth's biographer, his nephew, Christopher Wordsworth, D.D., says Mrs. Cookson was James' daughter, but this is an error. Nicolson and Burn, and all other authorities I have met with, say that James, although married, died without issue, leaving the estates to his widow for life, and after her to his sister Darotha and her heirs (male), failing which they were to go to the Rev. Adam Askew of Newcastle, whose mother was a Crackenthorpe, and second cousin to the said James. The first indication that Penrith was to produce an heir to Newbiggin, and not Newcastle, appears in the following entry in registers:—

1742, Oct. 26—Crackenthorpe, Richard, son of Mr. William Cookson, baptized.

This prospective heir to the Newbiggin estates died at two years of age. However, another is again forthcoming, as the following baptismal register indicates:—

1745, May 20—Christopher Crackenthorpe, son of Mr. William Cookson, baptized.

Next we have —

1748, Jan. 20—Ann, daughter of Mr. Cookson, mercer, baptized.

Here we meet for the first time, with the future mother of Wordsworth, the poet. In 1750 Thomas is baptized; he died in 1771. 1754, Dec. 26, we have William, son of Mr. William Cookson, mercer, and Dorothy his wife, baptized. Then, after a few years' interval we come to a very interesting entry in the marriage registers:—

John Wordsworth, of Cockermouth, bachelor, and Annie Cookson, of Penrith, spinster, a minor, Feb. 5, 1766.

These are the future parents of the poet.

THE WORDSWORTHS.

This will be a suitable place to speak about the Wordsworths of Westmorland and Cumberland. The first of the name was Mr. Richard Wordsworth, attorney at law. He came to Westmorland to manage the law business of the Lowthers. He was of a good old family of Wordsworths in Yorkshire. On coming into Westmorland he purchased a house and small estate at Sockbridge, and married Mary Robinson, of a notable Appleby family. Mrs. Wordsworth is said to have been a clever, brave woman—valuable qualities for the times in which she lived. At the time of the 1745 rebellion, Mr. Wordsworth was receiver-general for the county, and for the security of the public money in his charge, on the approach of the rebels, he went off with his money bags to a remote glen at Patterdale, leaving his wife to face the foe; and this she well knew how to do. Her plan was to stock the larder abundantly, make them smilingly welcome, and so send them away contented. This estimable couple's family consisted of two sons, Richard and John, and one daughter, Anne. Richard was sent into Yorkshire to his father's friends to complete his education, which he did in a way of his own by marrying his cousin while he was yet a mere youth, which so offended his father that it is said he disinherited him. John appears to have been always a good boy. He served his articles with his father at Sockbridge, and as from that place it was only a short pleasant walk to Penrith, no doubt he frequently took it. Perhaps also he got a cup of tea and had a delightful hour or two at the house of Mr. William Cookson, mercer—not at Mr. William Cookson's, grocer—oh, no! there was no attraction there! Mr. Cookson, mercer, lived in the house, since rebuilt, and now the premises of Messrs. Arnison, drapers. The situation was then called Burrowgate, which then comprised the Market-place—in fact all the heart of the business part of the town.

When John Wordsworth became a fully fledged attorney at law, he went to Cockermouth to manage the law business of the Lowther estates in West Cumberland; and to that town, as we

have seen, he eventually carried off his Penrith bride, aged eighteen. Five baptismal registers are entered at Cockermouth, and then a very sad one at Penrith, as follows :—

1778, March 11th—Mrs. Wordsworth, wife of John Wordsworth, Esq., of Cockermouth, 'aged 30. Buried.

The poor lady had been on a visit to friends at London, who had honoured her with the use of the best bed, which being, as best beds often were, a damp one, sent her back to the north with the hand of death upon her to die at her father's house in Penrith. Mrs. Wordsworth left four sons and one daughter—Richard; William, the poet; Dorothy; John, captain in the E. I. Marine, who perished at sea; and Christopher, D.D., Master of Trinity College, Cambridge. The bereaved husband never recovered his loss, and five years and a few months afterwards died in consequence of exposure all night upon an open moor, having lost his way in the dark when on a professional journey. Much of William Wordsworth's childhood was spent at his grandfather's house at Penrith, where he received the first rudiments of his education, under a worthy old dame teacher, Mrs. Birkett, who had taught three generations of young Penrithians of the better class. Little William shared the smiles and frowns of the good old dame with little Mary Hutchinson, the daughter of Mr. John Hutchinson, a leading tradesman in Penrith, variously styled "tobacconist" and "merchant." It looks like a case of child love with little William Wordsworth and Mary Hutchinson, destined to mature in after life into mutual attachment, for Mary eventually became the poet's wife.

Wordsworth himself, writing of his childhood's days at Penrith, says: "The time of my infancy and early boyhood was passed partly at Cockermouth and partly with my mother's parents at Penrith." He tells of once going into the attics of his grandfather's house upon some indignity having been put upon him, with the intention of destroying himself with one of the foils kept there, but, he adds, "I took the foil in hand, but my heart failed." "Upon another occasion," he says, "while I was at my grandfather's

house, along with my eldest brother, Richard, we were whipping tops together in the drawing-room, on which the carpet was only laid down upon particular occasions. The walls were hung round with family pictures, and I said to my brother, 'Dare you strike your whip through that old lady's petticoats?' He replied, 'No, I wont.' 'Then,' said I, 'hère goes,' and I struck my lash through the old lady's petticoats, for which, no doubt, though I have forgotten it, I was properly punished."

On the death of Mr. John Wordsworth, his children were left but ill-provided for, Sir Jas. Lowther (afterwards Earl of Lonsdale) had got from him, ostensibly as a loan, all his savings, amounting to £5,000, and refused to restore it, even for the benefit of the orphan children. This lawless and inhuman act was unatoned for to the day of the earl's death. However, his successor, about 1801, nobly restored the money with interest, amounting in all to £8,500. In the meantime, the two uncles—Mr. Richard Wordsworth, of Whitehaven, and Mr. Christopher Crackenthorpe—did their duty by the children, and gave them a good education. Mr. Christopher Crackenthorpe Cookson, the heir of the Newbiggin estates, was at the age of forty-three, still only heir, and still a bachelor. James Crackenthorpe's widow must have had a long widowhood, and Christopher was evidently in no haste to marry. At length, however, our unfailing parish register comes to the front again, and presents us with the following marriage register:—

27th of August, 1788—Christopher Crackenthorpe Cookson, of this parish, bachelor, aged 43, and Charlotte Cust, of this parish, spinster, aged 32—by me W. Cookson, officiating minister, in the presence of Martha Cust and G. Raincock.

The officiating minister is the bridegroom's brother, Doctor Cookson, Fellow of St. John's College, Cambridge, and afterwards Canon of Windsor, grandfather of Mr. Montague Cookson Crackenthorpe, who now inherits the Newbiggin estates in succession to his great-uncle, the late Mr. William Crackenthorpe, who was never married. The bride of Mr. Christopher Crackenthorpe Cookson—Charlotte Cust—was daughter of Mr. Cust, surgeon and apothecary, Penrith.

Dorothy Wordsworth, the poet's famous sister, also spent much of her early life at her grandfather Cookson's house, and so long as the worthy old mercer lived there was a home at Penrith for his orphan grandchildren.

Returning to the registers of the Cookson family, we see in—

1790, Feb. 26—William, son of Mr. Christopher Crackenthorpe Cookson, baptized.

This is the late well-known Mr. Crackenthorpe, of Newbiggin Hall, who died about three years ago; so we see how near he was to being a centenarian. It will be observed that Mr. Crackenthorpe and the poet were first cousins, with a difference of twenty years in their respective ages, Wordsworth having been born in 1770, and Mr. William Crackenthorpe in 1790.

Mr. Christopher Crackenthorpe Cookson had a daughter Charlotte, born in 1791, and a daughter Sarah in 1794, on which latter occasion he stands in the register as "Christopher Crackenthorpe, Esq." His mother having enjoyed the Newbiggin estates for one year after the death of James Crackenthorpe's widow, died in 1792, when he succeeding her in the inheritance, dropped the name of Cookson and assumed that of Crackenthorpe.

There is just one more Cookson register to notice, and that is the marriage of the Rev. Dr. William Cookson, who comes to Penrith to wed Dorothy Cowper, daughter of the Rev. John Cowper, vicar of Penrith. The marriage is dated October 17th, 1788, and is witnessed by William Monkhouse and Dorothy Wordsworth. Dorothy was then about seventeen years of age. She had been of late living much with her uncle, the rev. bridegroom, at Froncett, and probably came to Penrith with him for the auspicious occasion. There is a rather curious circumstance in connection with the register of this marriage—the bridegroom's age is stated to be thirty, whereas by the baptismal register it was thirty-three; the bride's age is also stated as thirty, while the baptismal register makes it out to be thirty-four years.

Wordsworth went to Cambridge in 1787, and during the

summer vacation of 1788, after visiting Esthwaite, the scene of his schoolboy days, and other parts of the Lake District, he during the latter part of the vacation visited Penrith. His biographer thus alludes to this visit:—"His mother's relatives resided at Penrith, on the southern frontier of Cumberland. Here he was restored to the society of his sister, and of one who was one day to be nearer to him than a sister (Mary Hutchinson). He enjoyed with them those delightful scenes by which Penrith is surrounded. He mounted the Border Beacon on the north-east of the town; and on that eminence, now (1851) overgrown with fir trees which intercept the view, but which was then free and open and displayed a glorious panorama, he beheld the wide plain stretched far and near below, closed by the dark hills of Ullswater on the west and by the dim ridges of Scotland on the north."

Wordsworth's visit thus so eloquently described must have been just before his uncle's marriage, the vacation ending on October 1st, and the marriage being on the 17th. There is no record of Wordsworth again visiting Penrith until 1794, when he was there for some months attending to his friend Raisley Calvert, who, as an invalid, had come to Penrith. On that occasion Wordsworth lodged with Mrs. Sowerby, at the Robin Hood Inn, the premises now occupied by Mr. Cockbain, in King-street. Raisley Calvert died at Penrith, but was not buried there. After his death it was found he had by his will left Wordsworth the sum of £900, which little fortune enabled him to devote himself to a literary life without the dread of poverty. Mary Hutchinson, the poet's future wife, lost her mother in 1783; her brother William died the year following, and her father the year after that. Their tombstone, a large flat, blue slab, level with the ground, may be seen near the north-west corner of the church tower, in a line with the raised tomb of the Monkhouses, of which family Mrs. Hutchinson was a member. After the death of her parents, Mary Hutchinson with her brother and sisters left Penrith for Sockburn, in Durham, and afterwards went into Yorkshire, whither in 1802, Wordsworth, aided and abetted by Dorothy, his loved and indispensable sister, went to claim Mary as his wife. Wordsworth and

Mary Hutchinson were married at Brompton church, near Scarborough. De Quincey has said that Mary Hutchinson was Wordsworth's cousin, but this was certainly not the case; her mother was Mary, eldest child of Mr. John Monkhouse, attorney at law, and the Penrith registers, as also the Wordsworth pedigrees, make it certain that no marriage connections had ever existed between either the Hutchinsons or Monkhouses, with the Cooksons or Wordsworths, so that there could be no kind of cousinship between the poet and his wife.

The life-long devotion of Dorothy Wordsworth to her poet brother, prompting his genius, supporting and encouraging him in every phase of life, and his loving reliance upon her, would appear to have afforded no place for a wife; and yet Mary Hutchinson, as the poet's wife, was in the most perfect harmony with both. Surely such a human trinity of love and concord seldom existed in the world!

Another much-loved member of the poet's family at Rydal was his wife's sister, Sarah Hutchinson. Wordsworth's biographer says of her: "She was a person of cultured mind, sound judgment, refined taste, tender affections, and fervent piety." Sarah Hutchinson's grave is one of the Wordsworth group in Grasmere churchyard. Her epitaph describes her as "the beloved sister and faithful friend," and records that she was born at Penrith, 1st of January, 1775.

I will now as briefly as possible allude to Wordsworth's relations who resided at Penrith. His uncle Richard was receiver of customs at Whitehaven, and his son John, who was a captain in the East India Company's Marine in 1804, came to Penrith and purchased the house now occupied by Dr. Montgomery, from Mr. Isaac Parker, who had built it in 1792. The adjoining house, lately occupied by Miss Bleaymire, was built by Mr. William Wilson at the same time and from the same design. Upon the leaden spout heads of the houses may be seen the initials of the original proprietors. Upon the corner of the house towards Portland-place the initials are those of Isaac and Sophia Parker, and upon the other the initials of William and Mary Wilson.

The parish marriage registers tell us that in 1788, "William Wilson, Esq., aged thirty-eight, of the parish of Heskett, married Mary Grave, aged twenty-two;" and that in 1790, "Isaac Field Parker, Esq., aged twenty-two, of the parish of Heskett, married Sophia Grave, a minor." Each of the marriages is witnessed by Matthew Grave. Then turning to the baptismal register, guided by the age of one bride and the inferred age of the other, it is found that Mr. Matthew Grave was father of both brides. This then is the story of the pair of houses erected in 1792 by the husbands of two sisters. Captain John Wordsworth resided in the house he had purchased until 1820, when by accident or insane intention to get through the skylight in the front part of the roof, he fell to the ground and was killed. The late Mr. Jacob Thompson, then a boy going to school, witnessed the catastrophe. The house occupied by Miss Bleaymire has lately been called "Wordsworth House," but it never had the slightest connection, except perhaps that of the party wall, with any of the Wordsworths; neither is there any evidence that the poet ever entered the other house occupied by his unfortunate cousin John.

When our Society lately visited Grasmere, all were struck with admiration of the well cared for Wordsworth graves and monuments, but I then thought with regret that the poet's mother and her ancestors were lying in unknown graves in Penrith churchyard, without a stone to mark their resting place; and that the mother of an illustrious poet and a learned Master of Trinity, and grandmother of two bishops, should be so forgotten that no one can point out where she lies. There may, however, have been a Cookson monument of perishable stone, now lost. The dilapidated state of the old monuments is indeed deplorable, in consequence of the barbarous condition of the churchyard up to the early part of this century. In fact, it was literally an open village green with footpaths crossing it in various directions; no wonder then that monuments were broken or trodden out of recognition, and brasses torn from the stones and sold for old metal. The enclosure of the churchyard in 1824 was an excellent work, but it came too late—the mischief had been done, and can never be repaired.

We have seen from the will of William Cookson, that a gravestone with a suitable inscription had to be laid over his grave ; it is therefore almost a certainty that one of the four blank sandstone slabs now lying on the surface of Penrith churchyard, from which time and ill usage have obliterated every vestige of inscription, would, if intact, mark the burial place of the poet's immediate maternal ancestors, and, as a natural sequence, that of his revered mother ; but, while the monumental slabs of Mary Hutchinson's and her mother's family, the Monkhouses, are, owing to the enduring character of the slate stone employed, almost as fresh as the day they were laid down, that of the Cooksons, if in existence, is a complete blank.

ADDENDA TO FORMER PAPER, 1888-89.

As supplementary to some subjects treated of under special headings in my former paper on "Notabilia of Old Penrith" (*Transactions* No. XVI, 1888-9), I subjoin the following as tending to clear up the doubts as to Bishop Strickland's parentage.

BISHOP STRICKLAND.

The Lowther pedigree at Lowther Castle states that Robert Lowther married a Strickland, but without giving her family. Nicolson and Burn, however, say she was Margaret, daughter of Bishop Strickland, and this appears to be confirmed by the record in Queen Elizabeth's Foundation Charter of Penrith Grammar School, that the lands in Penrith parish chargeable with the payment of six pounds a year to Strickland's chantry were then in the possession of Richard Lowther, making it pretty clear that the Bishop's estate at Penrith had passed by the marriage of his daughter and heiress to the family of Lowther. Nicolson and Burn, in describing the Lowther armorial bearings, amongst other

quarterings therein give "Sable three escalops within a bordure ingrailed argent, by the name of Strickland." Now as this quartering is identical with the Sizergh Strickland arms, it follows that if Robert Lowther's wife was the Bishop's daughter, then her father was entitled to bear the Sizergh Strickland arms, thereby proving him to have been of that family, notwithstanding the absence of his name from the family archives.

Nicolson and Burn, and also the Lowther Castle pedigree, make Mabel, daughter of Robert Lowther and his wife, marry a Lancaster of Sockbridge; it was therefore a grand-daughter, not the daughter of the Bishop, whose marriage into that family is alluded to by St. George's Westmorland, 1615 visitation.

THE HUTTONS OF HUTTON HALL, PENRITH.

Adam de Hoton, the founder of this family, first appears at Penrith in the reign of Edward I., in which also the manor of Penrith was granted to Anthony Beck, the warrior Bishop of Durham. Now as Hoton, Houghton, Hutton (and other variations of the spelling of the name) was a common name in the north-east, it appears very probable that Adam of Hoton came from bishop Beck's country as a trusty henchman of the Bishop to represent him in the manor, for the history of that period plainly indicates that the military bishop had occupation enough at home in repelling the aggressive Scots in the east, to satisfy even his combative proclivities.

Supposing this to have been the origin of Adam de Hoton's advent to Penrith, what would be more likely than that a slice of the manor of Penrith should be carved out for his maintenance, and thus originate the mense manor of Hutton Hall, Penrith?

My surmise that the John Hutton who was ambassador at Brussels in 1538, and who so diplomatically evaded the dangerous responsibility sought to be put upon him by Henry VIII.'s minister Cromwell, of recommending a fourth wife for the King, was the Penrith John Hutton of the period, was repeated in the *Westmorland Note Book* as a query, asking for information on the subject. The enquiry elicited the following cogent reply:—

“One would imagine it must be difficult for any man, at this distance of time, to say quite certainly whether the John Hutton ‘required by Henry VIII.’s minister (Cromwell) to report’ as referred to above, was John de Hoton, of Penrith, unless he had documentary proof of it. But, as to the probability of it, there cannot be very much question. The father of the John Hoton of Penrith, who was of Henry VIII.’s time, was named William; and the son and heir of John was Anthony. According to Stow, King Henry VIII., in 1495, sent certain persons to Calais to entice over to this country ‘Sir Robert Clifford, who, with others, was plotting for Perkin Warbeck, believing him to be the son of King Edward IV.’ The ‘Privy Purse’ expenses of King Henry VII. show that on the 20th January, 1495, William Hoton and Harry Wodeford received £26 13s. 4d. as a reward for successfully negotiating with Sir Robert Clifford*, who came over and was pardoned.

“The ‘household expenses’ of Clifford, Earl of Cumberland, (quoted in *Whittaker’s History of Craven*), show that in 1525, Anthony Hoton, and five other Westmorland (and Cumberland) gentlemen, were attendants on the Earl at the Court (seemingly at Greenwich, at the time referred to).† That would be, very probably, a group of youthful gentlemen. We may presume that it would be a man with an older and cooler head and heart, that would be asked by Cromwell, a few years later, to report upon a suitable fourth wife for the eighth King Henry. Anthony, of Penrith, would be as fitted by his age for the position with the Earl of Cumberland, as John, his father, would be, by his age, for the more delicate and difficult task of the minister Cromwell. And it therefore seems very “probable,” at least, that we thus see three successive generations of the Penrith Huttons (William, John, and Anthony) engaged, in one way or another, for or about the Court. (1381).

“W. HUTTON-BRAYSHAY.”

* A descendant of a distant branch of the Westmorland Cliffords.

† This would probably be on the occasion of Henry Clifford, son and heir of the Shepherd Lord, being created Earl of Cumberland by Henry VIII., with whom Henry Clifford had, as boy and man, been a close companion and favourite.

In my former paper I mentioned the Hutton monuments in the Choir of St. Andrew of the demolished church, and referred to the effigies of Mr. Anthony Hutton and his wife Elizabeth, so minutely described by Bishop Nicolson in 1704. The inscriptions, according to the Bishop, were two in number, one was—

“Here lyes interr’d Anthony Hutton Esqr who was a Grave, faithful and judicious Counsellor at Law, and one of the Masters of the High Court of Chancery; Son and Heir of that renowned K^t S^r William Hutton of Penrith; and was matched into the Noble Family of S^r Thomas Burdett of Bramcourt in the County of Warwick Baronet, by the marriage of his vertuous sister Elizabeth Burdett; whose pious care and religious bounty hath erected this marble tomb to perpetuate the memory of such a worthy Commonwealth’s-man, and of so dear a Husband who dyed the 10th of July, 1637.”

The second inscription was—

“Here lies the Portrature of Elizabeth Hutton, the wife of the late deceased Anthony Hutton; who, though living, desired thus to be placed in token of her union with him here interr’d, and of her own expected mortality.”

How long the widow continued to gaze upon her own sepulchral effigy and expect her death, the burial registers inform us by the following entry which I think there can be no doubt refers to her:—

1673—Elizabeth Hutton, gentlewoman, widow, buried.

She therefore lived in widowhood 36 years after the erection of the monument. This contrasts curiously with a similar case in Cornwall, where the widow erected effigies of her deceased husband and herself, and married another husband within three months. These Hutton Hall monuments, along with other brasses and tablets, recorded by Bishop Nicolson in 1704, have been missing ever since the church was rebuilt in 1720-22. It is probable they were taken to Hutton Hall for security while the church was being rebuilt, with the intention of re-erecting them in the new church when completed, but the misfortunes of the Hutton family at that

time prevented it. Richard Hutton, as we have seen, died three years before the re-building of the church commenced, leaving his heir Addison Hutton, a boy in his teens; and it looks as if no one was found to care sufficient about the monuments to restore them, and that they remained neglected and uncared for at Hutton Hall until it was sold to Mr. Gasgarth, when the monuments were destroyed or carried away. That it was the intention of the church builders to provide for their restoration to the church appears from the fact that the east end of the south aisle corresponding to the old St. Andrew's Choir, was left vacant, and continued so until the church was re-seated about twenty-five years ago, when it was utilised as a vestry. In the floor of this space there is a large slab of blue stone bearing just sufficient traces of an inscription to identify it with the slab described by Nicholson and Burn, as the monument of Mr. Richard Hutton and his daughter Barbara, of whom we have just been hearing. This slab is now covered with the wood floor of the vestry, but if exposed, would be unintelligible. The inscription, originally, very slightly incised, is all but worn away by being walked upon. It would be a graceful act to place a brass plate upon the wall containing the original inscription, as recorded by Nicolson and Burn. The lost Hutton effigies have lately been found at Nunwick Hall, lying in an open yard exposed to weather and injury, and being only of plaster of Paris (as Nicolson and Burn say they were), are sadly mutilated; they have been removed to Great Salkeld churchyard, where, of course, they have no right to remain, Penrith Church being their proper home.

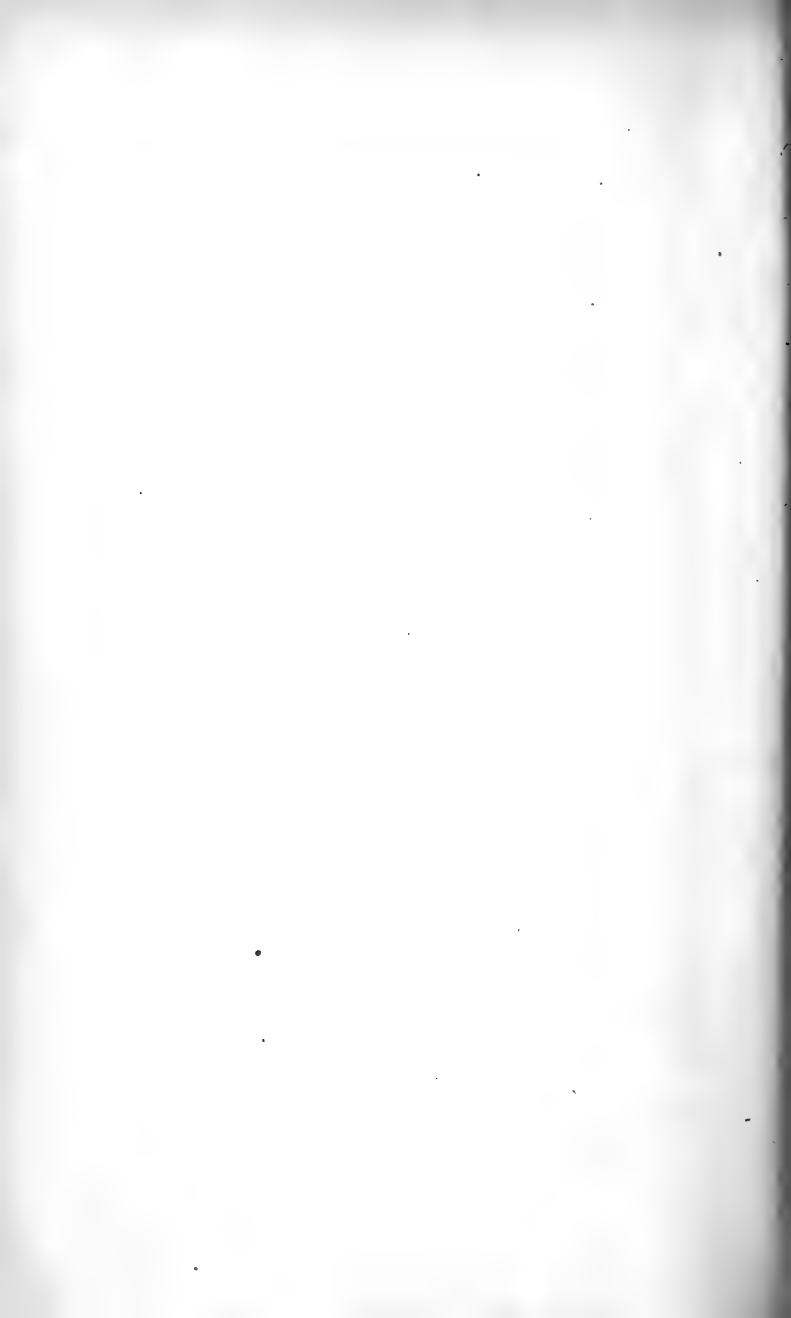
WILLIAM ROBINSON.

The mystery attached to William Robinson, the seventeenth century benefactor of Penrith, referred to in my former paper, has now been cleared up. Hitherto he has only been known through his public benefaction to Penrith, an extract from his will relating thereto being all the documentary information known. The benefaction to Penrith, consisting of £55 a year for religious, charitable, and educational purposes, is in the hands of the

Grocers' Company, London; and a personal application at that Company's Hall for information about William Robinson having been met with the utmost courtesy and attention, it was ascertained that the William Robinson who left a benefaction to Topcliffe Grammar School, as mentioned in my former paper, was another and earlier man, and a native of Topcliffe. The information obtained about the benefactor of Penrith was, that his will was dated August 9th, 1661, and proved on the 29th of the same month, thus fixing the time of his death within a few days. Then with a view to ascertaining his age at death, so as if possible to find the entry of his baptism in the Penrith registers, the registers and monuments of his parish church, St. Dunstan's, in the east of London, were searched; but of the munificent grocer no trace could be found.

However, with the ascertained date of the proving of his will, I soon had the satisfaction of perusing that document in its entirety at Somerset House. From it we learn that he was an owner of property in Penrith, which property he bequeathed to his sister Barbara, wife of John Stephenson of Penrith, besides considerable money bequests to her and her son William and daughter Mabel, the latter then living with him at London; both nephew and neice being minors. Other legacies were left to his cousins Richard and Thomas Bresby of Penrith, also to his cousin John Stephenson of the Nuke (Nook), Penrith, and others, all of whom can be identified in the Penrith registers, as also can the place-name "Nuke."

William Robinson's place in the registers cannot be determined with certainty, in consequence of the very numerous Robinson entries at that period. But I take him to be the William, son of Thomas Robinson, baptized August 29th, 1613, the said Thomas being no doubt the Thomas Robinson who in 1606 married Mabel Bresby, aunt, we may suppose, of William Robinson's cousins Richard and Thomas Bresby, to whom he left the legacies mentioned in his will.



MR. W. KINSEY DOVER, F.G.S.

BY J. POSTLETHWAITE, F.G.S.

IT is with extreme regret that I have to record the death of Mr. WILLIAM KINSEY DOVER, F.G.S., at Low Nest, on the 27th of March, 1891, in his seventy-fifth year. Mr. Dover's education began under the tutorship of the Rev. E. Wilson, of St. John's Vale; subsequently he was sent to Hawkshead Grammar School, which was then under the management of Dr. Hickey, a teacher of some repute in his day. After leaving school Mr. Dover went to London, where he was engaged for some years in mercantile pursuits; but not feeling himself adapted for commercial life, he left the city and entered the Cumberland Militia, being gazetted as ensign in 1855, lieutenant in 1861, and captain in 1865. He served some time with his regiment in Ireland, where the Militia was on garrison duty during the Crimean War. On returning from active duty in 1868, he devoted himself to field sports and the study of Natural Science, spending a portion of each year in the West of Ireland, or in Scotland, amongst the wild fowl. Occasionally he contributed to the Natural History column of the *Field*, articles on shooting, fishing, and the habits of birds. He also formed a collection of fresh-water shells.

Mr. Dover had passed the meridian of life when he took up the study of palæontology, but he entered into it with the same energy which had formed a prominent feature in all his pursuits. He began to collect Skiddaw Slate fossils about 1870; and as very little had been done prior to that time, he had the field practically to

himself. Being unencumbered by either family or business cares, he took lodgings at some farm-house near the section he wished to work, and when that was exhausted, moved to another locality. With these advantages, and the assiduity with which they were applied, Mr. Dover obtained a magnificent collection of fossils, and largely advanced our knowledge of the fauna of the Skiddaw Slates.

Mr. Dover was elected a Fellow of the Geological Society in 1880, and became a Member of the Geologists' Association in 1881. He acted as one of the directors of the Long Excursion to Keswick and the Lake District in 1881, and was associated with Professor Morris, Mr. W. H. Huddleston, and Mr. E. de Rance in preparing a report of that excursion; but beyond that, he was not a contributor to geological literature.

In the summer of 1890 Mr. Dover presented his collection of Skiddaw Slate fossils to the Woodwardian Museum, where they will remain as a monument of his patient and persevering industry in the cause of geological science.

THE STORY OF GOUGH AND HIS DOG.

BY THE REV. H. D. RAWNSLEY, M.A.

WE had been talking about the sagacity of our Cumberland collies, "But there is no tale so touching," said *my friend, "as the story of that Rizpah among dogs, who watched for three months her dead master 'fade away' in the 'savage place' by the Red Tarn, on Helvellyn. I have been lately collecting from the Classics, from prose writers and poets in many lands, some pictures and incidents of dog-life. The 'Friend of Man' has nowhere appeared so human in its tender kindness, so faithful and affectionate in its memory, as in this instance of terrible vigil.

"The unburied corpse with the lone watcher on the mountain has seemed more solemn to my imagination than the graves by which so many dogs have hungered till they died. How one wishes that some record of that heroic little creature could be placed where passers by might see it and ponder."

"The thing can be easily done," I answered. "We have but to get leave from the Lord of the Manor to erect a cairn upon Helvellyn overlooking Striding Edge, and build into it a simple slate-stone slab that shall record the fact, and shall serve to remind its readers, of the tragedy, and the pathetic incident which so touched the hearts of three poets in the memorable year 1805. Memorable to Scott for that in the April of that year he gave his 'Lay of the Last Minstrel' to the world; memorable to Wordsworth because that he finished in mid-May of that year the poem that

* Miss Frances Power Cobbe.

described the marvellous making of his own mind in 'The Prelude.'"

So the thing was agreed upon, and the inscription to be engraved was written; and not without much writing in and writing out did it take final shape as follows:—

"Beneath this spot were found in 1805 the remains of Charles Gough, killed by a fall from the rocks. His dog was still guarding the skeleton.

"Walter Scott describes the event in the poem—

'I climbed the dark brow of the mighty Helvellyn.'

"Wordsworth records it in his lines on 'Fidelity,' which conclude as follows:—

'The dog which still was hovering nigh,
Repeating the same timid cry,
This dog had been through three months space
A dweller in that savage place.

How nourished there through such long time,
He knows who gave that love sublime,
And gave that strength of feeling great
Above all human estimate.'

"In memory of that love, and strength of feeling, this stone is erected."

The Stone-cutter set to work, and had barely finished the lettering of the first line, when a correspondent put into my hands an extract from a letter of one of the guide-writers of the Lake District:—"You are perhaps aware that Charles Gough was not after all found on Striding Edge, but on Swirrel Edge, on the slope overlooking Keppelcove Tarn. I had the information from one R—— at Windermere, who got it from a man at Grasmere whose informant was the finder of the body, and I think there can be no mistake."

One had more faith in Wordsworth's and Sir Walter's accuracy of description than to be much put out by this bit of hearsay.

Walter Scott, in his poem entitled "Helvellyn," would never have written :—

"On the right, Striding Edge round the Red Tarn was bending,
And Catchedecam its left verge was defending,
One huge nameless rock in the front was impending,
When I marked the sad spot where the wanderer had died,"

if he had not actually visited the place and asked, as was his wont, a thousand and one local questions of the shepherds who bore him company.

Wordsworth too is very particular in his description :—

"It was a cove, a huge recess,
That keeps till June December's snow ;
A lofty precipice in front,
A silent tarn below !"

He had evidently in his mind a tarn deep-bosomed in the mountain, from which the rocks rise sheer ; he calls them further on "abrupt and perilous rocks." And when he adds :—

"Thither comes
.
. . . the sounding blast,
That, if it could, would hurry past,
But that enormous barrier binds it fast."

he makes one feel how near to the Tarn these lofty precipices are.

Now, anyone who knows Keppelcove Tarn, will remember that it does not lie under lofty precipices that stand up straitly from it, or hem it in with abruptness ; while on the other hand, as the traveller approaches Red Tarn from the east, he sees the "enormous barrier" of the "Cove Head" rocks rise up for several hundred feet, dark and fearfully, above the Red Tarn, and the "arms of Helvellyn and Catchedecam" fairly seem to clasp the steel-white water-jewel of the Tarn to the rugged mountain breast.

The modern guide-writer was perhaps unaware that an older writer of guides, one Forbes, the then curate of Wythburn, who would have every chance of being accurately informed, had written

half a century ago (in 1839), that Gough's body had been discovered accidentally by shepherds on the edge of Red Tarn.

But it was easy to ask the informant R—— of Windermere for particulars, and his answer was as follows :—“Dear Sir,—The place where Gough was supposed to be killed was Striding Edge. He was found by John Grisedale of Patterdale, who is dead, and his grandson is dead, and none of the family are living.” The letter went on to tell me of one old man still living in Patterdale who made a mark where the body was found and sowed the spot with grass seeds.

It looked as if the Wizard of the North had been more accurate than ever, when he described the place :—

“Dark green was that spot, 'mid the brown mountain-heather,
Where the Pilgrim of Nature lay stretched in decay.”

And when one remembered how in the autumn of the same year in which Gough had died, Walter Scott and Humphrey Davy had left their white pony at the stake by the Red Tarn ; gazed at the ill-fated Striding Edge and that to this day “huge nameless rock” from which the traveller fell to his death, and then had “climbed the dark brow of the mighty Helvellyn,” one was quite sure that the writers of the poems “Helvellyn” and “Fidelity” had made up their minds as to the whereabouts of the accident and the scene of the lonely watching of the faithful dog.

What a day was that ! Scott we know was in one of his raciest moods, overflowing with mirth and anecdote, though doubtless not a little disconcerted by that untimely salutation from the jovial host of the Swan, that Miss Martineau has chronicled : “Why, sir, ye've coomed seun for ya glass to-day.” An untimely speech, which told the water-drinking bard that the Swan Inn had been making up any deficiencies in the Dove Cottage hospitality. One can imagine how the matter if touched on at all, was made subject of banter as they went up Grisedale. But there would fall upon the company silence and a cloud, as they rode round Grisedale Tarn ; for it was here where Wordsworth had parted from his beloved brother John, who perished by the shipwreck of the *Earl*

of *Abergavenny* on February 6th of the same year, 1805. And he may have murmured the stanza, written probably in the July preceding:—

“ Here did we stop, and here looked round,
While each unto himself descends
For that last thought of parting friends
That is not to be found.”

How the silence and the cloud would again fall on them, as they walked round the Red Tarn, startled the eagle, saw the hill fox steal away, heard the cry of the raven and buzzard, and the pipe of the grey plover, clambered with difficulty along the sheep track among the scattered rocks of Striding Edge, to the place where poor Gough's body was found, or sat on the great boulder stone that lies by the track up Swirrel Edge and gazed across the Red Tarn at the “nameless crag,” “the cliff huge in stature,” which had witnessed the wanderer's dying and the faithful dog's watch by the side of its master “in the arms of Helvellyn and Catchede-cam.”

But as they climbed up by Swirrel Edge to Helvellyn brow the sun would chase even these dark shadows quite away, the spirits of Scott and Wordsworth would revive, so that thirty-two years after, Wordsworth, when on a tour with Crabbe Robinson in Italy, goes back in thought to that occasion and his genial guest, and in his “Musings near Aquapendente,” describes glowingly the view he obtained on that serene autumnal day when he stood with the Wizard of the North on old Helvellyn's brow—

“ Where once together, in his day of strength,
We stood rejoicing, as if earth *were free*
From sorrow, like the sky above our heads.”

Lockhart in his “Life of Sir Walter Scott,” vol. ii. p. 70, thus chronicles the incident:—

“About this time Mr. and Mrs. Scott made a short excursion to the Lakes of Cumberland and Westmorland, and visited some of their finest scenery, in company with Mr. Wordsworth. I have found no written narrative of this little tour, but I have often heard Scott speak with enthusiastic delight of the

reception he met with in the humble cottage which his brother poet then inhabited on the banks of Grasmere; and at least one of the days they spent together was destined to furnish a theme for the verse of each, namely that which they gave to the ascent of Helvellyn, where, in the course of the preceding spring, a young gentleman having lost his way and perished by falling over a precipice, his remains were discovered, three months afterwards, still watched by 'a faithful terrier-bitch, his constant attendant during frequent rambles among the wilds.' This day they were accompanied by an illustrious philosopher, who was also a true poet—and might have been one of the greatest of poets had he chosen; and I have heard Mr. Wordsworth say, that it would be difficult to express the feelings with which he, who so often had climbed Helvellyn alone, found himself standing on its summit with two such men as Scott and Davy."

But it was not only Scott and Wordsworth who had been touched to the heart by the faithfulness of Gough's dog. Ryan, in his "Poetry and Poets," tells us, as a prefatory note to the poem "Helvellyn," that Walter Scott and Campbell walking together and speaking of this incident each agreed in the spirit of amiable rivalry to make it the subject of a poem. Scott on his way home composed the following exquisite lines, which he sent next day to Campbell, who returned them with this reply:—"I confess myself vanquished. If I were to live a thousand years I could never write anything equal to this on the same subject;" and he never attempted it.

Wordsworth was evidently struck by Scott's poem, for after telling us that Scott and he without either of them knowing that the other had taken up the subject, had written a poem in admiration of the dog's fidelity, added, "his contains a most beautiful stanza—

'How long didst thou think that his silence was slumber?
When the wind waved his garment how oft didst thou start?'"

The subject was touched on by minor poets also. Thomas Wilkinson of Yanwath—whose spade Wordsworth once apostrophised—speaks thus in a poem entitled "Eamont Vale":—

"The moon had thrice revolvéd through the sky,
When a lone shepherd heard a wailful cry
Far in Helvellyn. Following the sound,
The dog, the robes, the owner's name were found.

His scattered bones a train of shepherds brought
 Down the steep mountain and the valley sought ;
 By Lady-Beck his light remains they bore,
 And dug his sepulchre on her peaceful shore."

The verses are interesting only as being written by a man who lived within hail of Helvellyn and of the little Quakers' burial ground at Tirril, who knew well the facts of the finding of the body and was present at Gough's funeral.

"I attended," he writes, "the interment of the remains of the poor young man, when they appeared so light, that it would not have been difficult to have borne them to the grave under one's arm."

A Mrs. Ryves who in 1812 dedicated a small volume of Cumbrrian legends to H.R.H. the Princess Charlotte of Wales, in a poem called "Fragment of the Recluse," speaking of the nobleness of dog nature incidentally alludes to the death of Gough thus :—

"And when the distant wand'rer yields his breath,
 No friend to dress his limbs in decent death,
 Patient, his faithful dog, unhousted, unfed,
 Alone defends the precincts of the dead ;
 Pious by instinct, guards the sacred clay,
 And sullen howls the midnight hours away."

This is poor stuff, but the authoress appends a note which is of interest :—

"A circumstance occurred in Cumberland, during the author's residence there, of a remarkably affecting nature. A stranger who had been for some time exploring the lakes and fells, was attended by his faithful dog in the midst of those wild regions, and without any decided habitation from which he might be missed. It was supposed by those who found him that his death was occasioned by a sudden precipitation from the top of the cliff beneath which he was discovered ; he appeared to have been about six weeks dead. Close at his head lay his faithful spaniel, which had during the interval pupped and was rearing her pups beside her master. She was almost famished, yet had not been known to seek for shelter or support in any human habitation."

Here was the story as it was current in the Lake District within seven years of the event ; but one wished to hear the contemporary

accounts of the matter, and so a hunt was made in the county newspapers of the day.

The *Carlisle Journal* of 27th July, 1805, reports as follows:—

“About five weeks ago a Mr. Goff (sic) of Manchester, who had come to the neighbourhood of Keswick, Cumberland, in order to view and take a plan of the lakes, set out one morning from where he lodged at Wighburn (sic) with his rod and instruments, and was never heard of until Monday last, 22nd inst., when he was discovered upon the summit of a mountain Helvellyn, near a lake there, dead, and in the attitude of a person drawing, by a shepheard (sic) who had been attracted to the spot by the barking of a spaniel-bitch which had attended the deceased. The bitch had pupped in a furze bush near the body of her master, and, shocking to relate, had torn the cloaths (sic) from the body and eaten him to a perfect skeleton. It is supposed he had been taking a view of the lake when he was seized with a fit, and no assistance been at hand, had unfortunately perished. Another account say (sic) that the deceased has been missing since April last, and that no part of the head has yet been found.”

This account is copied into the *Newcastle Chronicle* of August 3rd, 1805, and is full of error. Gough did not start from Wythburn, but from Patterdale. His body was discovered Saturday 20th; the inquest was held on Monday the 22nd, as the enclosed document from the Coroner attests. I have to thank the Clerk of the Peace of Westmorland for this.

“Robinson Cartmell for inquisitions, 1805, July 22nd.

1805, July 22nd, West Ward, to an inquisition taken on view of the body of a person unknown at Patterdale.

Distance 23 miles.

£1. 17. 3.”

The *Lancaster Gazette* of July 27th, 1805, gives another version:—

“On Sunday last was found, at the foot of a precipice called Cat’s-tree, on the mountain Helvellyn, near Patterdale, Cumberland, the remains of a man named Charles Gough, of Manchester, he had spent two or three fishing seasons at Grasmere; was at Patterdale the 1st of May last, on his way thither, and had not been seen since. He had with him a small spaniel bitch, which had staid near him and pupped, and, by her barking at some shepherds, led to the discovery. She had only one whelp with her. The man’s head was not found, and most of his flesh was gone, supposed to have been devoured by birds of prey. He had a watch and money in his pocket, and papers in his

pocket-book, which identified him. His remains were interred in the Quaker's burial ground, at Tirril, on Thursday last, he having been a member of that society till about two years ago, when he was excluded for joining a Volunteer corps."

The correspondent evidently did not know that it was the 18th of April when poor Gough was last seen or heard of in Patterdale; but there is much of detailed knowledge in the account which must have been the result of some local enquiry.

Three days after the publication of these papers, appeared the two following accounts in the *Cumberland Pacquet* under date July 30th, 1805:—

"On Saturday the 20th ult., the dead body of a gentleman was found near Red Tarn Crag in Patterdale, in this county.

"From the name being engraved on his gold watch, it is known to be the remains of a Mr. Charles Gough, a young man, supposed to belong to Manchester, who had been some time before in that neighbourhood, for the amusement of fishing: and about five weeks before the discovery of the body (probably the day upon which he died), had dined at Mr. Dobson's, a house of entertainment in Patterdale.

"Red Tarn is situate near the high mountain, called Helvellyn; and whether the unfortunate man had fallen from one of the adjoining eminences, or by what other means he came by his death, cannot be known from the putrid and mangled state of the body, for, it appears that a small brown bitch, which accompanied him, had pupped after the fatal event: which, together with her litter, was found near his remains, uncommonly fat! And the flesh of the latter was mostly consumed."

From another correspondent, we have the following account of this melancholy circumstance:—

"On the 18th April, Mr. Gough was at Patterdale, on his road to Wyburn, a place he frequently visited in summer, for the amusement of fishing. After receiving some refreshment at the inn, he requested the assistance of a guide, to conduct him over the mountains; but, it being a general review day of the Volunteers in that neighbourhood, he could not procure one. He therefore proceeded on his journey, without any other companion than a favourite spaniel, and had never been heard of since, till Saturday the 20th, when a shepherd's boy passing near the fatal spot was attracted by the howling of the dog, who was still watching over his master. The boy immediately informed some of the inhabitants of Patterdale of the circumstance, who hastened to the

place, and found the entire skeleton except the skull, which was about seven yards off, lying at the bottom of a precipice of about 200 yards. His fishing rod was at the top, and a small bundle about half way down.

“In contradiction of the report that the dog had eaten his master, I have to state, from the opinion of some well-informed people in the neighbourhood, that from the frequency of the carcasses of animals being devoured by birds of prey (which assemble there in great numbers), there can be little doubt that his body had fallen a sacrifice to those voracious birds. About an hour after he set out from Patterdale a great quantity of hail fell, accompanied with a heavy fog, which continued over the mountain the whole day, so that it is most probable he had missed his way, when he met with the fatal accident, and was not taking a view of the adjoining mountains, as has been intimated. His remains were collected and decently interred in the Friend’s burying ground at Tirril on the 22nd. The deceased was born in the Society of Quakers, of which he remained a member till about two years ago, when (in conformity with the professed principles of the Society) he was excluded for joining a Volunteer Corps.”

A comparison of these two accounts in the *Cumberland Pacquet* leaves no doubt on one’s mind as to which was the better informed of the two correspondents. In the former there is complete ignorance of the date when Gough was lost, and of the hailstorm and fog that probably led to his fall from Striding Edge, and the writer’s one idea appears to be to account for the “uncommonly fat” condition of the dog and her litter, found near her master’s remains.

The latter correspondent has evidently made himself acquainted with much detail, he has seen the letter in the *Carlisle Journal*, contradicts flatly, upon what he considers good authority from the lips of some “well-informed people in the neighbourhood,” the sinister suggestion that the dog had fattened upon her master’s body, and pooh-poohs the suggestion that Gough perished of cold as he sat making a sketch.

The letter is the letter of a well-read man, and emanated probably from a certain member of the Friends’ Society named John Slee, who was a noted scholar, and kept an advanced school or academy near Tirril in those days.

Such were the contemporary accounts which have furnished writers all the way down to to-day with their accounts of Gough’s

death and of his canine friend. There are other accounts in print that require brief notice.

Of these, in order of date we have first the Rev. Joseph Wilkinson's, for whose "Select Views in Cumberland and Westmorland and Lancashire," Wordsworth wrote the preface, 1810—1821. He speaks of Red Tarn as "a desolate spot formerly haunted by eagles that built in the precipice which forms its western barrier. These birds used to wheel and hover round the head of the solitary angler." Alas for the angler! The eagles were last seen upon Helvellyn in 1836. Eagles and tourists do not seem to get on well together.

"It also," continues Wilkinson, "now derives a melancholy interest from the fate of a young man, a stranger, who perished here a few years ago, by falling down the rocks in his attempts to cross over to Grasmere. His remains were discovered by means of a faithful dog who had lingered here for the space of three months, self-supported, and probably retaining to the last an attachment to the skeleton of its dead master." It is clear that Wilkinson did not believe that the dog had turned cannibal.

John Robinson wrote his "Guide to the Lakes" in 1819; he was rector of Clifton in Westmorland, and would be able easily to make any enquiries in Patterdale that he thought necessary, and it is probable that he had met Gough. He tells us that "in the spring of 1805 a young gentleman of talent and of a most amiable disposition, who was making a solitary tour, and had left Patterdale with the hopes of reaching Wythburn, unhappily trusted too much to his own local knowledge, lost his way and perished beneath 'the dark brow of the mighty Helvellyn.'" This gentleman, whose name was Charles Gough, had inquired at Patterdale for a guide to Wythburn; but there being, as it is believed, a review of the Volunteers in the neighbourhood on that day, no person could be procured to direct him. It snowed too on that day. He was therefore advised to remain at Patterdale till the day following; but unhappily he did not comply with this advice. The remains of this unfortunate gentleman were not discovered till three months afterwards, when they were found guarded by a

faithful female terrier, his constant attendant during his rambles through the wilds of Cumberland and Westmorland." Then follows the poem of "Mr. Walter Scott," and the concluding stanza of Wordsworth's "Fidelity."

It is evident that the compiler of Allison's "Northern Tourists' Guide to the Lakes," which was published first at Penrith in 1827, and passed through many editions, got his inspiration from Robinson, but a foot-note of considerable importance was added, probably from local knowledge. "The whitened bones of the hapless dead, the only remains of this unfortunate tourist, were interred at Tirril, and were so light that it would not have been difficult to have borne them to the grave under a person's arm." This Allison got from Wilkinson of Yanwath. Perhaps he was indebted to Wilkinson for the following facts also: "Fourteen weeks after the time he left Patterdale, his remains were discovered by George Harrison, a servant at Hallsteads, who was attracted to the spot, by seeing a dog and hat and some clothes. It is supposed he was precipitated from Red Cove Head Rock, his penknife having been found there, with his name engraved upon it. His fishing-rod was discovered thirty yards from the summit. Two guineas and a half in gold and fifteen shillings in silver were found in his clothes and given to the overseer at Patterdale."

It was clear from this account that Christopher North had in one particular romanced in his terrible story of the "Red Tarn Club Raven Orgy." "There must have been great difficulty," wrote Christopher in 1825, "to the most accomplished of the carrion in stripping the Quaker of his drab. The broad-brim had probably escaped with the first intention, and after going before the wind half across the unfrozen Tarn, capsized, filled, and sunk." And yet one almost forgives a man the ghastliness of his humour; and humour there certainly is, not only in the account he gives of the difficulties the ravens had to get through the well-swathed wrappings of decent drab, and at the poor Quaker's body, but in that grim comical ending of the feast when one old bird, who spoke the Westmorland dialect, exclaimed after half an hour's silence: "I'se weel nee brussen! there be's Muster

Wudsworth. Ho! ho! ho!" and when "The Red Tarn Club," afraid of having their orgies put into blank verse by "the bard benighted in the Excursion from Patterdale to Jobson's Cherry-tree," sailed away in floating fragments beneath the moon and stars.

I say one almost forgives Christopher North for his grim humour, and this because of his opening sentence: "There can be no doubt that that foolish Quaker who some twenty years ago perished at the foot of a crag near Red Tarn was devoured of ravens." For Christopher North was well acquainted with raven land, and raven ways, and doubtless had stood many a time on Helvellyn High Man and heard, as Budworth, the writer of "A Fortnight's Ramble to the Lakes," (quoted by Harrison in his Guide of 1802, p. 159) had heard, "the ravens croaking" when he gazed down upon Red Tarn, "shaped like a Bury pear" in the cove beneath!

And better far does it seem that the poor traveller should have fallen a prey to the fowls of the air, those natural scavengers of the mountain side, than that the honour and fidelity of his faithful four-footed friend and mourner should be called in question.

Without endorsing De Quincey's statement that the poor little creature "could never have obtained food or shelter through his long winter's imprisonment," we gladly give his account of the accident, for he is in sympathy with the subject. His information was probably gathered during his stay at Grasmere between 1808 and 1819:—

"The case of Mr. Gough, who perished in the bosom of Helvellyn, and was supposed to have been disabled by a sprain of the ankle, whilst others believed him to have received that injury and his death simultaneously in a fall from the lower shelf of a precipice, became well known to the public, in all its details, through the accident of having been recorded in verse by two writer's nearly at the same time, viz., Sir Walter Scott and Wordsworth. But here again, as in the case of the Greens, it was not the naked fact of his death amongst the solitudes of the mountain that would have won the public attention, or have obtained the honour of a metrical commemoration. Indeed, to say the truth, the general sympathy with this tragic event was not derived chiefly from the unhappy tourist's melancholy end, for that was too shocking to be even hinted

at by either of the two writers (in fact, there was too much reason to fear that it had been the lingering death of famine)—not the personal sufferings of the principal figure in the little drama—but the sublime and mysterious fidelity of the secondary figure, his dog; this it was which won the imperishable remembrance of the vales, and which accounted for the profound interest that immediately gathered round the incidents—an interest that still continues to hallow the memory of the dog. Not the dog of Athens, nor the dog of Pompeii, so well deserve the immortality of history or verse. Mr. Gough was a young man, belonging to the Society of Friends, who took an interest in the mountain scenery of the Lake District, both as a lover of the picturesque and as a man of science. It was in this latter character, I believe, that he had ascended Helvellyn at the time when he met with his melancholy end. From his familiarity with the ground—for he had been an annual visitant to the Lakes—he slighted the usual precaution of taking a guide.

“Mist, unfortunately—impenetrable volumes of mist—came floating over (as so often they do) from the gloomy fells that compose a common centre for Easedale, Langdale, Eskdale, Borrowdale, Wastdale, Gatesgarthdale (pronounced Keskadale), and Ennerdale. Ten or fifteen minutes afford ample time for their aerial navigation; within that short interval, sunlight, moonlight, starlight, alike disappear; all paths are lost; vast precipices are concealed, or filled up by treacherous draperies of vapour; the points of the compass are irrecoverably confounded; and one vast cloud, too often the cloud of death even to the experienced shepherd, sits like a vast pavilion upon the summit and gloomy coves of Helvellyn. Mr. Gough ought to have allowed for this not unfrequent accident, and for its bewildering effects, under which all local knowledge (even that of shepherds) becomes in an instant unavailing. What was the course and succession of his dismal adventures, after he became hidden from the world by the vapoury screen, could not be fully deciphered even by the most sagacious of mountaineers, although, in most cases they manifest an Indian truth of eye, together with an Indian felicity of weaving all the signs that the eye can gather into a significant tale, by connecting links of judgment and natural inference, especially where the whole case ranges within certain known limits of time and of space. But in this case two accidents forbade the application of their customary skill to the circumstances. One was, the want of snow at the time, to receive the impression of his feet; the other, the unusual length of time through which his remains lay undiscovered. He had made the ascent at the latter end of October, a season when the final garment of snow, which clothes Helvellyn from the setting in of winter to the sunny days of June, has frequently not made its appearance. He was not discovered until the following spring, when a shepherd, traversing the coves of Helvellyn or of Fairfield in quest of a stray sheep, was struck by the unusual sound (and its echo from the neighbouring rocks) of a short quick bark, or cry of distress, as

if from a dog or young fox. Mr. Gough had not been missed; for those who saw or knew of his ascent from the Wythburn side of the mountain, took it for granted that he had fulfilled his intention of descending in the opposite direction into the valley of Patterdale, or into the Duke of Norfolk's deer-park on Ullswater, or possibly into Matterdale; and that he had finally quitted the country by way of Penrith. Having no reason, therefore, to expect a domestic animal in a region so far from human habitations, the shepherd was the more surprised at the sound, and its continued iteration. He followed its guiding, and came to a deep hollow, near the awful curtain of rock called Striding Edge. There, at the foot of a tremendous precipice, lay the body of the unfortunate tourist; and, watching by his side, a meagre shadow, literally reduced to a skin and 'to bones that could be counted (for it is a matter of absolute demonstration that he never could have obtained either food or shelter through his long winter's imprisonment) sat this most faithful of servants—mounting guard upon his master's honoured body, and protecting it (as he had done effectually) from all violation by the birds of prey which haunt the central solitudes of Helvellyn:—

‘How nourished through that length of time,
He knows, who gave that love sublime,
And sense of loyal duty—great
Beyond all human estimate.’”

Edward Baines in his “Companion to the Lakes,” 1830, adds nothing to our knowledge. W. A. Chatto, under the *nom de plume* of “Stephen Oliver,” in 1834, in his “Recollections of Fly Fishing in Northumberland, Cumberland, and Westmorland,” simply copies the account that Slee may have written to the *Cumberland Pacquet* in 1805, but emphasises the fact of the presence of foxes and wild birds which haunt the fells and prey upon the carcasses of the sheep and lambs which lie among the hills, as accounting for the destruction of the flesh from the body of the unfortunate traveller.

During my search among records of Gough's death a correspondent sent me an extract from the “Papers, Letters, and Journals,” by William Pearson, printed for private circulation in 1863. William Pearson was born at Borderside in 1780, and he writes—“On the 20th of August, 1822, I set out and went from Crosthwaite (Westmorland) to Keswick that day . . . was told by the landlord at Wythburn, who knew Mr. Gough who perished on Helvellyn, that his dog was a little brown cocker, but

had turned grey on the back while on the mountain, and become wild."

This looked like a determining of the question of the kind of dog that had accompanied his master, and had the landlord been of the Cherry-tree, and not of the Horse Head, one might have been satisfied; but it was at the Cherry-tree, and not at the Horse Head, where young Gough usually stayed, as evidenced by a writer in "Hone's Table-book," p. 535, under date July 24th, 1827. "Opposite Wytheburn Chapel, which is the smallest I ever saw, I entered into conversation with a labouring man, who was well acquainted with the late Charles Gouche (sic), the gentle 'pilgrim of nature' who met an untimely death by falling over the precipice of Helvellyn. Some time previous to his death he had lodged at the Cherry-tree, near Wytheburn. The man related many anecdotes of him, but none particularly interesting. Mr. Gouche (sic) was an enthusiastic admirer of poetry, which he would frequently recite to him and others of his friends."

It was at the homely Cherry-tree inn, where, according to Budworth, at the end of the last century and the beginning of this, a breakfast of mutton, ham, eggs, butter-milk whey, tea, bread, and butter, and cheese, were served for 7d. a head—that the young artist who loved the poets had his intermittent habitation. Thence from time to time, leaving his trunk behind him, he ascended the slopes of Helvellyn for a spell of fishing in Patterdale. Thither he descended from time to time, sketch-book, bundle, and fishing-rod in hand, and doubtless he beguiled many a long evening in the humble kitchen parlour with his recitations. The "Waggoner" may have seen him and heard him at the famous "merry-neet" that he lingered there, on his way from Ambleside to Keswick, for the Cherry-tree was "half-way house of call" in those days.

One had learnt as much as one could learn from records of Gough and his dog or dogs, for it was plain that opinion from an early date was divided as to the kind of dog that had accompanied him. Was it terrier or cocker spaniel that had won immortality at the mouths of Scott and Wordsworth?

All that Wordsworth had told us was that "it was not of mountain

breed ;" not a collie dog, and that it barked like a mountain fox. The spaniel's voice hardly answers to this description, there is a yap in the wild fox cry which I do not think will be found in spaniels or cockers.

Perhaps the painters would be able to help us. The artists would surely have seized on such a subject and made it their own. So far as could be ascertained only four pictures were in existence, one by Daniell, R.A., which was exhibited in the Royal Academy about 1833, a woodcut of which is given in "Domesticated Animals," published by Parker in 1834. The dog there depicted above the dead master, clad in tartan kilt, is a huge white terrier of mongrel breed. Another picture by Pettitt is described by King Matthew, in which he tells us "the faithful dog (a little white terrier bitch which lived in Grasmere many years after the event) is keeping watch over the remains." Landseer's picture makes it appear like a retriever, if memory serves me. The fourth was a beautiful water-colour drawing, full of meaning, by Harry Goodwin, and therein the dog suggested is a black and tan collie.

It was high time to obtain some news direct from any representative of the family who might chance to be alive ; and good fortune allowed me an introduction to the sole surviving member, in the direct male line, Miss Agnes Gough, the grandniece of the faithful dog's master, only daughter of the late rector of Charlton-on-Otmoor, near Oxford, who was a Fellow of Queen's College, and who died in 1862. I had previously gathered that the young man was known in Manchester as the son of a wool-stapler who was sprung from Crosby Garrett and had cousins in Kendal. He was believed to be in the office of a firm named Wadkin, acting as traveller for them. It was clear that what with his love for the poets and the pencil, his devotion to animals, his care for fishing, and his enthusiasm for the Volunteers, he had departed from the tradition of his fathers, but it was in vain that I attempted to get a copy of the "minute of disownment" which was, it is said, found in the young man's pocket after death, because this expulsion from the ranks of the Friends had taken place before the Hardshaw Monthly Meeting at Manchester was divided into East and West.

The mother of my informant as to Gough's Manchester connexion had lived in the same street as the Goughs resided in, in Manchester, and had said that she remembered Mr. Gough always went out with a dog and a walking-stick—small evidence this, perhaps, of his anti-Friendly ways; and was a pleasant-looking young man.

Miss Gough had kept by her some old family deeds, and kindly forwarded me any documents that seemed likely to let in light as to Charles Gough's early history; from these I learned that Joseph Gough, son of Joseph Gough of Manchester, gentleman, and Esther his late wife deceased, and Margaret Gough, daughter of Joseph Gough of Kirkby Kendal, shearman dyer, and Elizabeth his wife, had declared their intention of marrying before several meetings of the people called Quakers, and in the fear of God and before the assembly of the aforesaid people in the meeting house of Preston Patrick, Westmorland, did solemnly take one another for better or worse on the 26th day of the 6th month called June, in the year 1779. Sixteen friends and relatives witnessed the document of marriage. And I imagine, from the oil paintings that have come down to us of Joseph, in stock and wig, and his cousin Margaret in magnificent head-dress of silken damask, that they were as pretty a pair of lovers as might well be found at Preston Patrick meeting.

Charles Gough, the son, was born, as an entry in the family Bible put it with preciseness, "on the eighteenth day of April, 1782, at three-quarters of an hour past five o'clock in the morning." And as I write there lies before me a little time-stained piece of parchment of interest, on which is written in the old Quaker birth-note style:—

"On the Eighteenth Day of the Fourth Month, called April, one thousand seven hundred and eighty-two, was born at Manchester, in the Parish of Manchester, in the County of Lancaster, unto Joseph Gough, junr., and Margaret his wife, a son, who was named Charles.

"We who were present at the said Birth, have subscribed our names as witnesses thereof.

"DOROTHY STRETCH.

"HANNAH HODGSON."

It was a coincidence that at about five o'clock of the afternoon of the 18th day of April, 1805, the young man should have perished by the Red Tarn.

The father died young, leaving the widow with the two sons, Charles and Harry, and one daughter, Elizabeth, who afterwards married Dr. Flint of Leek, a gentleman in comfortable circumstances. This disposes of the pitiable tale of forlornness and bankruptcy and family heartlessness, as told by Christopher in his "Aviary." The Professor's tale is pure romance—though living at Elleray as he did, he doubtless could have got to know any facts he might wish of the Gough family.

That the young man was a passionate lover of nature and architecture is seen in eight old mezzotint drawings of landscape and architecture, made on a Scotch tour, 1803—1805, and signed by Charles Gough in a clear, fine, copperplate hand.

These old drawings, while they show care and anxiety to give faithful renderings of form and scene, show also that the young man had been self-taught, and that he had yet much to learn as an artist.

Charles Gough's love of the mountains and of lonely wanderings among the fells, is a matter of tradition in the family. That Gough was fond of sport was remembered by an old gardener of Miss Gough's grandmother at Kirkby Stephen, who told a person now living, that he often went with Mr. Charles fishing, and when his body was brought down from the fells, this old man got hold of a bit of the plaid it was wrapped in, and the family kept it in their possession till quite lately.

There seems to be uncertainty whether this branch of the family migrated from Kendal prior to young Gough's death, but they claim a joint descent, with the family of the famous blind John Gough, from Goff the Parliamentary general. They pronounce their name as "Goff," and it is probable that they were sprung from the common Wyresdale stock. Distant cousins of the name of Wilson, and of the Friend Society connexion, have long dwelt in Kendal. Portraits in oil of Charles Gough's father and mother exist at Abingdon, but no portrait or drawing of Charles is in

existence.* I can not learn what happened to the silver pencil case or gold watch, said to have been found upon Charles' body with his name engraved thereon; but when the present Miss Gough's father and mother were making a tour of the Lakes in 1857, the egg-cups and toast-rack which poor Charles used at the old Cherry-tree were shewn to them, kept lovingly as memorials of the wanderer who died upon Helvellyn.

Making enquiries in the Wythburn dale, it was well remembered by old men whose fathers "kenned" young Gough, that he was a "particular nice young man, varra free, and most particular fond of fishin' an' aw, an' knew ivery beck this side o' t' Raise." It was remembered that "he mostly-what in a general way stayed at t' Cherry-tree wi' t' oald chap as was afoor Mark Allison, and went ower to Patterdeal for a spell, and wad then coom back for a bit to Wyburn, ye kna, but nivver a wud o' warnin', it was coom and goa wid him, and so fwoaks in Patterdeal thowt he wad be ower i' Wyburn, and fwoaks in Wyburn likely thowt he was still in Patterdeal, and nivver nea search nor nowt."

As to the kind of dog that had watched by his master's body, "it was just a laal yallow short-haired tarrier dog, that was t' common repwort; hooivver, it's said 'at it hed hed pups, but pups war aw deead, an' t' tarrier was varra nar pinched to deeach an' aw, and varra wild, cudn't git it, ye kna, but hed to lay hounds on and hunt it down."

What did it live on? "Leeve! Theer was plenty o' carrion sheep for it to leeve on i' t' ghylls at that time o' year."

This I heard was the accepted version among the Helvellyn shepherds, who, one and all, averred that they had "niver h'ard sec a thing spokken till, that t' laal dog eat t' maister on 'im, and they didn't believe a dog cud or wad neather, it 'ud hunger to deeach first, for dogs war sensible things, and varra human."

From a lady whose parents and grand-parents had resided in the Wythburn vale, I ascertained that her grandfather had often seen young Gough at "that house of prayer, as lowly as the lowliest dwelling—Wythburn Chapel—with his dog, which was a

* Charles Flint had the watch, and it was stolen from him by a tramp.

dark, short-haired, rough terrier, rather like a Dandie, with small ears, she thought."

But it was necessary to enquire in Patterdale, and, with a friend—that so out of the witness of two mouths whatever we heard of the truth might be established—I set off early in November, 1890, to make enquiry there.

Two witnesses shall be called, the first a little dark-eyed man whom we found sitting with his terrier dog in a tiny bedroom lumbered up with old curiosities, among which were the Latin and French and Greek books of his grandfather's day, for his grandfather had been a village schoolmaster out Ouseby way, in the time when the Dale schools gave a really liberal education, and who, as old W. put it, hed t' makkin' o' a deal o' priests, and yan on 'em a bishop."

He had "sarraed his time as a gardener," and had mixed up politics with his plants. "Was bwarn a Whig, and wad dee a Whig an' aw." Had cared for the poets, too, as he had cared for plants and politics. Could remember "ald Wudsworth," as he irreverently called him, and had "many a time cracked wi' lile Coleridge." "It was Hartley, ye kna, as writ that piece on t' heeadstean in t' churchyard." I didn't know it, but I kept the old man on this track of remembrance of the bard, and he went on: "Eh dear! but I can see him sitting now wi' a pot o' beer afoor him, makkin' gham o' a piece o' potery as Wudsworth hed meead about a pet lamb."

He was a character! The old man had tired of the narrow world in which he lived as a gardener, and determined to tramp to London to see Westminster and the Tower; had gone, for love of the statesman, out of his way to see Sir Robert Peel's house at Tamworth; and stayed a week at Lichfield because of Dr. Johnson and his Dictionary.

He could not tell us his age, but he remembered toddling to the inquest, held upon Gough's body at Braysteads farm, where one Errol or Earle, he thought, lived in those days.

The young man Gough, to the best of his knowledge, had called at Thomas Dobson's—the inn was actually owned by one Lancelot

Dobson. He had been seen to go up the old road by Grasthwaite How, without a guide, and a great mist and sleet came on, with a storm of hail, about four in the afternoon, and it was supposed he had fallen from Tarn Crag. The dog that was with him was a terrier much like his own in breed, so he had heard, he never saw it; it was "a yallow short-haired un," he had been told. The three pups were found dead all round her when she was discovered, and she was starved very nearly to death, but very wild, and no fight in her at all, so he had been told, when they loosened the hounds.

It was one they called Young, and another—he thought it might have been Grisedale, but of this he was not sure—that went up to bring the body down on Sunday, but it was George Harrison that found the body on the Saturday, when he was "lating woolled sheep, for sheep getherin' on t' fells, or clippin', he could not mind whether."

George Harrison and his brother William were shepherds "for yan John Mounsey, last King o' Patterdeal," and he had heard tell that "the skull was clean picked o' flesh, and was a gay good way off frae t' body, but aw t' rest o' t' body was togidder, and t' beans war inside t' cleas" (clothes).

The old man knew the place where the body was found, but never heard about grass seeds being sown. He was too infirm to attempt to get up to the spot now.

One fact that interested me much was the existence of a great "bowder stean" by the side of the old path up Swirrel Edge, or rather, where the old path zigzags into the newer path. "On that stean," he had heard his father say, "Sir Walter Scott sat, the day they came to see the place where the young gentleman was found, and to write their bits of potery about it." He knew all about Sir Walter, had read his poems, and was evidently of opinion that Sir Walter had gone to the "girt stean" to have a good look at the fatal cliff.

This was a hint to my friend and myself as to the whereabouts of the "huge nameless rock." When we afterwards climbed up to the Tarn, and leaving it on our left began to ascend Swirrel Edge,

we had little difficulty in identifying the isolated boulder upon whose broad back (carved with the letter O—I say this for identification's sake) had sat Scott in the autumn of 1805; and from that moment we felt assured that it was from the tall crag opposite, that goes somewhat into a hummock and then drops to the hause that connects Striding Edge with Helvellyn, that the storm-blinded traveller had fallen. And how like Scott it was to go off to such a vantage ground to get the view of that

“Huge nameless rock which in front was impending,”

and to

“Mark the sad spot where the wanderer had died,”

As to the Crag's name, old W. thought “it mostly-what got Tarn Crag,” but of that he was not sure. As to the dog, “it was a tARRIER, a laal yallow-brown tARRIER dog, so far as he knew, not a spaniel nor collie dog, just a laal yallow-brown dog, so far as he could tell, that had watched by the body, and pups was aw liggin' deead round her when they found her, and she was starved ameeast till a skeleton hersel'. But what, if we wanted to kna mair, we mud gang across t' deale and caw on George, son o' William, him 'at was shepherd in t' ald days to Mr. Mounsey o' Patterdeal Ha'.”

Right gladly did we “gang across t' deale,” and were soon busily engaged in recalling the old memories of the event, with the son of one of those who helped to bring the poor body down to the inquest, “just lapped up in a hay-sheet, for t' beens was aw lowse, and t' body was withered till a perfect skeleton,” so H. had heard his father say.

H. had heard tell that the young man was very venturesome, and would not be dissuaded by the host at the inn from going up, notwithstanding the day was a “dark day.” He had heard too of the review of the Volunteers at Penrith, which had taken place at the time, and seemed to have prevented the possibility of a guide, and he had been told that heavy hail fell an hour after Gough had set out up towards Striding Edge.

As to the place, he had heard from one R., who is a Patterdale

man over seventy years of age, a shepherd, and one who has hunted the fells ever since he could run, that the crag Gough fell from was a crag at the back of Lad Crag that faces out toward Grisedale, only a few yards from the far end of Striding Edge, as you go along it to climb Helvellyn. He had never heard of grass seeds being sown to mark the place, but R. had told him that there was a small heap of stones laid up near the foot of the crag from which Gough fell, and about one hundred and fifty or two hundred yards from its summit. He had never heard the crag get any name, nor had R., but he knew that our first informant, old W., believed it was called Tarn Crag. He thought W. was mistaken.

About the dog, he had heard his father say that the little dog was a fox-terrier, with hard short hair, and close coated. He had not heard that it was "poor" when it was found. It ran for some time when the fox-hounds were set after it, backwards and forwards, would not leave the place far, and ran to bay close to the spot where the body was found. He had heard that it ran well, and looked better than anyone could have expected.

G. H. had never known his father, or anyone, say what they thought had eaten the flesh of the dog's master, but he was quite sure that it would never have been the dog, it was not the way of them. "T' laal dog would likely find plenty o' carrion in t' crags or t' ghylls," and it was lambing time on the fells.

I asked if he had ever heard that the dog had eaten his master's body, and old H. said, "nowt o' t' soort, a dog wad nivver dea sic a thing; and he kenned dogs, for he'd been amang 'em aw his daays; it isn't t' naatur o' t' animal. But they did say that ravens hed picked at him a bit; and," he added, "I suddent wonder neather, there used to be a canny few theer away when I wur a lad."

He had heard old people talk about eagles on Helvellyn, but could not give the date of their last appearance. He had not heard that any part of the body was missing, but knew that the skull was separate from the body. Nor had he heard that the bones were broken at all, as they would have been if a dog had tried to get at the marrow; this confirmed old W.'s account. I

had previously asked W. if he had heard whether any of the bones were broken or lost, and his answer was, "No, they were inside the clothes, and all there, so he had been told."

He told us that the dog had been carried away after the inquest by some relation, his father had told him, but whither he knew not.

How it came to pass that the body was discovered was, that it was "sheep-getherin' time, and Mounsey' lads war off latin' woolled uns on t' high fells," so H. thought.

The Shepherds' Meeting on Helvellyn is fixed by law, as unalterable as the laws of the Medes and Persians, for the first Monday after the 20th of July, and this would account for the fact of the shepherds going up to the high fells, and scouring the recesses of that cove and the dark skirts of the screes that sweep down to the Red Tarn.

We had been well repaid for our Patterdale excursion, and a week or two later, the joint story of the Patterdale men was confirmed by one of the oldest living Helvellyn shepherds, who had always believed that the dog was "a laal wiry-haired tarrier dog, that was varra poor when runned to bay." He scouted the idea of her having lived upon her master, and had known, "a gay good lock o' years sen," a collie that remained till it was pined almost to death by the side of her master's body, near Wanthwaite Craggs on Helvellyn, and had then come home; and he argued that if, rather than feed upon its master, the collie came back, the "laal tarrier," had it not chanced upon a carrion sheep, would probably also have returned, for it would "ken" its way, as Gough frequently went from Patterdale to Wythburn, and it had only got to go down by the ghyll from the Tarn to find its road to the valley. "Fwoaks as thinks that a dog would mell of its maister's body knas nowt o' t' natur o' sec like things." So Willy W. said, as he knocked the ashes out of his pipe with great emphasis, and stowed it away with a look of pity and disgust: "They might as weel talk of a barn eatin' its deead fadder or mudder"—and there the matter ended.

I was glad of old Willy's word, for if any man knew dogs or dog-nature he did, and it was well to have some weight of opinion

against the suggestions of sinister import that had been born of the ill-informed correspondent's letter in the *Cumberland Pacquet*, in 1805, doubtless to be repeated by scoffers at dog-nature from time to time still. Indeed, since writing the above, I find an anonymous scribbler in the *Globe* of 15th July, trying to bring the poor little heroine of the Poems into contempt by asserting "that it is notorious in Patterdale, that the men who actually found the remains of poor Gough answered the question that puzzled Wordsworth, as to with what food the animal was sustained during the months that elapsed before its master's body was found, without any difficulty whatever." To this gentleman it will be enough to rejoin, that, having made very careful enquiries amongst those best qualified to give a judgment, I find every voice lifted up in reasonable contradiction to his statement, and in full accord with the well-informed correspondent's view who wrote the second letter in the *Cumberland Pacquet* of July 27th, 1805.

But if it was difficult to ascertain what kind of dog the faithful little guardian had been, it was still more difficult to trace what became of her after the inquest. All that was known in Patterdale was, that she was taken away by some one that came to the funeral in the Friends' burial ground at Tirril, beyond Pooley Bridge.

A paragraph appeared in the *Westmorland Gazette* of November 8th, 1890, as follows:—

"What kind of a dog was that which kept watch and ward over Gough through the weary days and nights its master lay a corpse near Red Tarn in 1805? Scott has immortalised the faithful creature in his poem on Helvellyn, and in a note he says it was a terrier bitch. This week I have received two enquiries on the subject from different parts of England, and as I happen to have been told by a dear old friend, now long passed away, that he well remembered this interesting dog, and had when a child often played with it, it may be well to put his account of the facts on record. After poor Gough's remains were interred, the dog was handed over to a cousin, I believe, of Mr. Gough's, who resided in Stricklandgate, Kendal. My old friend said the dog was a cocker. Whether it was a cocker, or a terrier, as Sir Walter has it, the wonderful endurance and fidelity shewn through these thirteen weeks of watching will always arouse admiration of the dog's attachment."

This, no doubt, was the cocker spoken of to Mr. Pearson by the Wythburn hostel keeper in 1824.

The late Mr. Foster Braithwaite of Kendal, in his "Angle Reminiscences," says, "This dog was sent to Mrs. Gough, an aunt of the unfortunate gentleman, residing at Kendal, and was frequently the playfellow of our worthy townsman Mr. Thomas Atkinson, when a boy."

Another claimant to the possession of the dog in the Kendal neighbourhood, is a certain Mr. John Gandy, who lived in the middle of this century with his brother James at Milnthorpe, and who, it is said by a friend, believed that the dog had preyed upon her master, "as the bitch was found with pups about her, and so she was not likely to have left her pups to seek for food."

In answer to whom, one has the testimony of the contemporaries and the tradition in the dales, that the pups were all dead about her, another argument for the suggestion that the poor little mother had, in her love for her master, even conquered her natural affection for her young, and gone off in quest for food even to the loss of her own little ones.

But was this cocker spaniel that went to Kendal ever with Gough's body at the Red Tarn on Helvellyn at all? Enquiry of the distant connexion of the Gough family still resident in Kendal, shewed that a dog, believed to be the faithful one, died there and was buried in "Sandys" Close, now Sandys Avenue; but Mr. W., the descendant of the dog's reputed protector in Kendal, writes, "Nothing but general impressions remain about the event or the dog here in Kendal. My impression has been and is that it was a terrier. I have heard it called a mountain-terrier."

By a happy chance it was my fortune to interview an old man in his ninety-second year, one Stamper by name, who had worked side by side with the one-time host of the Cherry-tree, and afterwards, so the old man thought, host of the Horse Head, in the days when, I suppose, having tired of public-house keeping, he had taken to joiner's work in a shop at Braithwaite. He "kenned" Jopson well. "And now," said I, "Did you ever hear of the young man who perished by Red Tarn on Helvellyn?" "What, him 'at lodged at t' Cherry-tree a lang while sen?" "Yes," I replied. "Oh, I kenned what fwoaks said about him, and oft

heard Jopson crack." "Well, what kind of a dog was it that watched by the dead body by the tarn all those weeks?" "It was a lile brown yallow spaniel dog," said he, "kind of a lapdog mak." "A cocker spaniel?" said I. "No, noa; a lile bit tarrier—fancy dog, ye kna, that's what it was." And so the secret was out. "Spaniel" in Cumbrian vernacular meant a lapdog, and the addition of the word "cocker" was a needless addition to the word spaniel, as spoken of to William Pearson of Borderside in 1822. My informant died the week after our talk. It was a happy chance that took me to his door.

I could learn nothing of the white terrier that doubtless was shewn to admiring tourists at Grasmere, as the heroine of Helvellyn, but was much interested in hearing that there was still living at Crosby Garrett an old body, Betty W., who had been in service as nurse with Charles Gough's brother Harry. Through the kindness of the great-niece of the lost traveller, and her friend Mrs. T. of Kirkby Stephen, I was enabled to push enquiry of this old servant.

Now in her ninety-sixth or ninety-seventh year, Betty asserted that she could remember well when she was a child a messenger coming with the sad news of Mr. Charles' death, and of Mrs. Gough, the mother, weeping over her lost son. She remembered that a man named Thomas Brunskill went with Mr. H. Gough for the corpse and the dog. Brunskill's son only died last year. As to Mr. Charles Gough, she remembered that he used to come on visits at Crosby Garrett; that he was very fond of fishing and walking about; that *he had two dogs with him, one larger and smoother haired and darker in colour than the other which she called "the Faithful one."*

Old Betty said the Faithful one's name was Foxey; it was a small light-brown or tawny smooth-haired dog, not so large as the black and tan terrier the interviewer had with her. On another occasion she said "it was a bonnie little thing, and she had nursed it many times when she was nursemaid at Mrs. Gough's of Crosby Garrett." Old Brunskill brought back from the funeral of Charles a plaid and the little dog, and she asserted that when it died, Brun-

skill buried it under an apple-tree in an orchard belonging to the house, where the family of Goughs were then living at Crosby Garrett, and put up some little mark with the words, "To the memory of Foxey," written upon it.

Here was what looked like a solution of the mystery of the two dogs that shared the honours of fidelity—Charles had two dogs with him. The Cocker Spaniel may have been "the larger smoother-haired and darker in colour" than the Faithful one that old Betty described, and it may either have been left at the Cherry-tree during Charles Gough's absence in Patterdale, or it may have survived the faithful little terrier Foxey, and have gone to Kendal when the wife of Harry, Charles' brother, died at Kirkby Stephen, whither they had removed from Crosby Garrett, and when the family, or some members of it, migrated to their grandmother Gough's at Kendal.

It was clear that this very old servant of the Gough family, who had nursed all the nephews and nieces of poor Charles, had a marvellous memory, from the details she gave about her charges in old nursery days. And I sent a drawing of a cocker spaniel to her by my correspondent, in order that she might say whether Foxey the Faithful was at all like it, and she was quite clear that Foxey was not like it either in shape or size or make of ears. So that one believes that the little lover of her master, who for her master's sake through three months cold and frost, rain and wind, watched him fading before her eyes—who perhaps did what she could, when not off seeking food, to "scare the hill-fox and the raven away"—who gave up even the joy of motherhood in her anxious concern for the fast dissolving body—who even when the hounds were set upon her refused to leave it, but circling round and round stood to bay, at last, by the side of that helpless, headless heap of silence and decay, was none other than a Terrier whose name may tell its colour, perhaps its breed. The faithful old nurse died within three months of her evidence, but she had helped the little smooth-haired Irish terrier to its right.

That devotion in the little watcher by the dead, has been long ago crowned with song, and when in memory of—

“that strength of feeling, great
Beyond all human estimate !”

we toiled up Helvellyn, through the heat of a long Midsummer day—June 18th, 1891—behind the sledge that, not without much difficulty, bore the record of “Fidelity” to the mountain top, we felt that the chains of love that bind man to the so-called brute creatures were stronger than had been thought of, and that the interchange of spirit between two worlds that seem so wide apart, was more possible than had been imagined.

There on the wind-combed mountain-top, above the dreadful precipice where Gough perished, the haulers of stone, the worker of mortar, the builder of the memorial cairn worked hard for a couple of days, and left behind them in what has been called “the Temple of the Winds and of the Sun,” a stone that may with its simple tale, touch the hearts of passers-by, for generations to come, and stand a monument to an heroic vigil, and to the Fidelity and Love, no death could quench, of the humble “Friend of Man.”

NOTES ON SOME OF THE LIMESTONES OF
CUMBERLAND AND WESTMORLAND.

BY J. G. GOODCHILD, H. M. GEOL. SURVEY, F.G.S., &c.

*(The substance of a Lecture given at the Maryport
Annual Meeting, August, 1891.)*

THE principal modes of formation of limestones in general were reviewed, with especial reference to the geological history of those occurring in Cumberland and Westmorland. Most of these limestones are of marine origin, and are due mainly to combined chemical action and the agency of organisms both animal and vegetable. The carbonates of lime set free as one of the results of atmospheric action upon various rocks containing calcium compounds, is carried by rivers towards the sea. At the zone of confluence of the river with the sea, most of the dissolved carbonate of lime is converted, by complex chemical reactions between the sea-water and that of the river, into sulphate and other salts of lime. In these forms it is widely diffused throughout ocean waters, and is thence assimilated by living organisms, which re-convert the various lime-salts into carbonate, in which form it constitutes greater part of the hard portions of their structure. On their death the organic carbonate of lime is left on the sea bottom as one of the chief constituents of limestone. But the ground mass, or paste, which, in all limestones, binds these organic constituents into compact rock, originates in a different manner. During the lifetime of marine organisms the diffusion of their own products of organic waste through the surrounding waters, of itself brings about chemical reaction upon

the lime salts existing in sea water, especially upon the sulphate of lime. This results in a small precipitate of carbonate of lime, which descends amongst the organic remains, and eventually forms the paste that binds the whole together into rock. Seeing that every fathom of sea water contains more or less decomposing organic matter of the natures referred to, a steady, if slow, precipitation of carbonate of lime must be always in progress of formation. Therefore, while the greater part of every limestone of marine origin is due directly to organic agencies, chemical action is accountable for the remainder. Concisely stated, the sequence of events resulting in the formation of limestone is as follows:—

- (1) Liberation of lime salts by the action of H_2CO_3 from a land surface.
- (2) Transportal in solution seawards.
- (3) Conversion into $CaSO_4$ and other lime salts.
- (4) Diffusion of these through oceanic waters.
- (5) Assimilation of these lime salts by organic agencies, which reconvert these lime salts into $CaCO_3$ (generally with the crystalline form of aragonite) which is subsequently left on the sea bottom.
- (6) Concurrent precipitation of $CaCO_3$ by the action of dead organisms, &c., upon $CaSO_4$
- (7) Cementation of the compound.
- (8) Conversion of the unstable form aragonite into the stable calcite.
- (9) Upheaval, and consequent formation of joints in the rock.
- (10) Further upheaval, exposure to denuding agents, and so through the same cycle of changes over again.

The following table exhibits the chief modes of origin of limestones:—

CLASSIFICATION OF LIMESTONES ACCORDING TO THEIR ORIGIN.

Conditions of Formation.

A. Subaqueous.

- (a) Organic agencies more prominent than the chemical.

1. Marine. Calcareous matter predominating.

Formed chiefly by animals.

Encrinital limestone.

Coral limestone.

Foraminiferal limestone.

Shell limestone.

Polyzoanal limestone.

Hydrocoralline limestone.

Formed chiefly by plants.

Nullipore limestone (oolites).

More or less siliceous in composition.

Diatom limestones.

Radiolarian limestones.

Poriferan limestones.

2. Sweet-water limestones.

Shell marls.

Chara limestones.

Indusial limestones.

(b) Chemical agencies more prominent than the organic.

1. Deposits in Saline waters.

Lagoon deposits.

Lacustrine limestones.

B. Terrestrial. Mainly of chemical origin.

1. Calcareous deposits from springs.

(a) Travertine, &c.

(b) Stalagmite and stalactite.

C. Subterranean.

1. Infiltration products.

2. Results of concretionary action.

3. Extrusions resulting from the liberation of lime during the transmutation of one silicate into another; e.g., when augite is transmuted into hornblende or into biotite.

D. Dolomitized, ferrified, silicified, marmorized, or other later modifications of any of the foregoing.

GENERAL SUCCESSION OF THE STRATIFIED ROCKS
OF CUMBERLAND AND WESTMORLAND, WITH ESPECIAL REFERENCE
TO THE LIMESTONES.

? Cretaceous Rocks in maritime North-West Cumberland.

Remains of the Jurassic Rocks (Lias Limestones at Great Orton.

Upper New Red, with their magnesian limestones at Stanwix.
Magnesian Limestone and Plant Beds.

Lower New Red.

Coal Measures, with their impure limestones.

Millstone Grit, with their impure limestones.

Yoredale Rocks, very persistent and important limestones.

Mountain Limestone, thinning to the north-west, passing into
the Calciferous Sandstone Series to the N. and the NE.

Lower Limestone Shale, and cornstones.

Upper Old Red Series, and cornstones.

? Middle Old Red, with their limestones [may be concealed on
the E.]

Silurian Rocks, with calcareous nodules, &c.

Ordovician Rocks, with the Coniston Limestone Series at the
top, and the Helton Moor Limestones, 2000 feet down.

Below these come the Borradale Volcanic Rocks, the
Ingleton Green Slate Series, the Milburn Rocks, and
then in part:—

Cambrian, the Skidda Slates.

Reviewing next the limestones of the district in chronological order, the lecturer began by describing those of Bala age. Two sets of these, occupying different geological horizons, occur within the district. Of these two the older (and least known) is found in the form of thin argillaceous bands in calcareous shale, on the fell-side slopes S.W. of Roman Fell summit, rather more than a mile to the S.E. of Helton, near Appleby. Here occurs a most important set of beds, which contain a considerable number of Ordovician fossils of Lower Bala types.* These beds dip towards

* See Woodward's *Geology of England and Wales*, 2nd Edition, p. and *Proc. Geol. Assoc.*, vol. xi., p. xcvi.

the north, and are succeeded in that direction (i.e. as we approach Roman Fell summit) by a thick series of ashy shales, ashy sandstones, tuffs, and lavas, having an aggregate thickness of at least 1100 feet. For this series, including the fossiliferous beds, the lecturer proposed the name of the Helton Moor Series. Their highest beds are not seen; but independent evidence, admitted on all hands, shews that these beds are older than the rhyolitic tuffs of the Seat, on Helton Fell. These latter are known to be identical with the tuffs of Knock Pike and Dufton Pike. Above these last comes the true Coniston Limestone series, which is seen in detached faulted blocks at Helton Smelt Mill, Keisley, Pusgill, Swindale Beck, Melmerby, &c.; and as a nearly continuous band extending from Shap Wells southwestward past the head of Windermere, Coniston, to Furness. It is seen again in and around the higher waters of the Rawtha, on the east side of the Howgill Fells. The Coniston Limestone series as a whole is of marine origin (like the older Helton Moor Shales), and it may be regarded as a series of fossiliferous calcareous shales in which calcareous matter predominates on different horizons in different localities. So that a bed of limestone in one locality may be represented by a bed of calcareous shale at a second locality not far off. The lecturer regarded the well-known and very fossiliferous limestone of Keisley as simply a less-argillaceous representative of the limestone seen in the higher part of the Coniston Limestone series in Swindale Beck, above the village of Knock. The existence of a thin calcareous band full of fossils in the volcanic rocks near the head of the river Sprint, midway between Shap Wells and the head of Windermere, has long been known; but the actual existence of any limestones near this geological horizon outside the Lake District was not recognized until the Helton Moor series was discovered by the lecturer in 1878. Beds of lava, tuff, trass, and flows of felspathic mud occur in connection with both the Coniston Limestone and the Helton Moor series. It is just possible that the remarkable series of fossiliferous beds discovered by Mr. J. E. Marr at Dry Gill in the Caldbeck Fells, may be the equivalent in time of the

Helton Moor beds. The lecturer had previously indicated the possibility of such a discovery being made.*

Strictly speaking, no true limestones of Silurian age occur in Cumberland and Westmorland. There is, however, a calcareous band at the very base of the Silurians in eastern Westmorland, that corresponds to the Pentamerus Beds of Wales. Calcareous concretions, often aggregated together in sufficient quantity to be almost entitled to be described as limestones, also occur here and there on various horizons in the Silurian rocks. Some of the lower of these must represent, in time, the well-known Dudley Limestone; while the higher concretionary zones must correspond with that of Aymestry.

Above the Silurian rocks occurs the greatest unconformity known in the whole geological series: a thickness of not less than five miles of strata being absent in places between the Older-Palæozoic rocks and the succeeding rocks of Carboniferous age. Part of this gap—but only a small part—is filled up by the Middle or Caledonian† Old Red, which in central Scotland consists of a vast thickness—many thousands of feet—of conglomerates and sandstones, with volcanic rocks in their higher parts. The whole series lies unconformably upon all the older rocks; so it is probable that the greater part of the unconformity traceable in Cumberland may date from times posterior to the highest of the Silurians, but anterior to the deposition of the Caledonian Old Red. There are reasons for believing that the Caledonian Old Red, or the higher members of that series, formerly covered the Lake District; and that it included some (possibly thin) beds of *limestone*.‡ The

* “I think it quite possible that, in some areas [referring to the north of the Lake District] beds even low down in the Skidda Slate series might be directly surmounted by the equivalents of the Coniston Limestone.”—*Proc. Geol. Association*, Vol. IX. No. 7, p. 9 of Reprint.

† The lecturer proposed this as a convenient designation for the “Old Red” which is unconformable to the Silurians on the one hand and to the true, or Upper, Old Red, on the other; thereby confining the term “Lower Old Red Sandstone” to that group which graduates downward into the Ludlow rocks.

‡ These may have been of marine origin, and therefore equivalent to the limestones of the Devonian rocks.

rearranged materials of rocks undistinguishable from such forms of the Caledonian Old Red as now remain in the Cheviots constitute a large part of the materials of the Upper (or Carboniferous) Old Red. These materials include (along with greywackes, etc., from the South of Scotland) many fragments of a limestone now no longer found in the district. Their source, like that of the greywackes just referred to, need, therefore, no longer be a source of conjecture.

In the period succeeding the Upper Old Red, i.e., the Lower Carboniferous Period proper, the greater part of the available evidence points to the area now represented by the Lake District having been, not an island, as many have concluded without studying the evidence, but an area that remained submerged from an early date, and for a prolonged period, beneath *clear* water. The present uplands there are simply the cores of old anticlinals exposed by subsequent denudation. The general configuration of much of the surface upon which the Carboniferous Limestone was deposited can still be made out with some approximation to certainty, and the physical character of some of the remainder can be inferred. It did *not* present the appearance of a mountain chain; nor, on the other hand, was it quite flat. A ridge, with long and gentle slopes *less than one degree* in gradient, extended from the higher parts of Teesdale through where Temple Sowerby is now, and thence across Ullswater, and Derwentwater westward. To the south of that bank lay deeper, and, certainly, clearer water, for a long time. On its north-east side for a long time went on *more rapid subsidence*, which was, however, balanced by the thicker deposits of sediment brought down from the old land lying to the north-west, and the direction of transport was towards the south-east in consequence, Limestones, accumulating in clear water, in the manner just described, were slowly and quietly deposited, sheet upon sheet, in the form of thin wedges, attenuating gradually towards the north-west. In the south-eastern part of the area the pile of thin wedges of limestone accumulated with hardly any admixture of mechanical sedimentary matter, until nearly two thousand feet of limestone had been built up. The thinning of

these wedges of limestone north-westward does not exceed fifty feet in a mile in any case that has yet been discovered, so that the gradient in the highest rate of thinning observed is only about 1 in 105, a slope so gentle even in that extreme case as to be practically imperceptible. Now and then, during the slight pauses in the depression of the land, the deltas advancing from the north-west carried out thin sheets of sediment, which were spread out far and wide over the newly-formed limestone; but in much less quantity towards the west than in the opposite direction. Then, as more rapid sinking ensued, and the shore line and its deltas were carried again far to the north-west, more thin wedges of limestone were formed. So sheet upon sheet, each a trifle thicker towards the south-east, and thinner in the opposite direction, were laid down, and the Mountain Limestone was formed. To the east of the Lake District it is true that the coarser nature of the sediment, and the larger percentage of deposits of mechanical origin to those of organic, shew that the delta in that area had early advanced farther towards the south than in the present area of the Lake District. But around what is now the Lake District, it is a very remarkable fact that the limestones accumulated during this period are singularly pure in themselves, and are also much less interbedded with sedimentary material, than are the beds of the same age only a few miles to the east.

We have, then, to picture to ourselves the present Lake District as a submerged area, nearly flat in shape, and slowly becoming buried beneath a pile of wedges of pure limestone. What shoals and islands there were lay, not where the Lake District is now, but in the areas to the *east* of it; and what land there was lay to the north and north-west. So, if we study the beds forming the Mountain Limestone in Cumberland and Westmorland, we find those beds thickest towards the south and south-east, and thinnest towards the north and north-west. Hence, instead of being fully two thousand feet in thickness as it is in the southern part of the area, the Mountain Limestone on the northern side of the Lake District may, in places, not much exceed thirty or forty feet. So, also, in regard to the mechanical sediments deposited between the

successive layers of limestone, we find these becoming much thicker towards the east, where the delta was advancing most rapidly; while on the west, where clearer-water conditions obtained throughout the whole period, the drifted materials become finer and finer as they are traced from east to west, until they nearly disappear altogether, and nothing but limestone is left.

Geologists recognize in the Lower Carboniferous Rocks of the North of England three, or four, subdivisions. These are, counting from below upward, (1) the Upper Old Red, (2) the Lower Limestone Shales, (3) the Mountain Limestone proper, which is represented by the Calciferous Sandstone Series in Scotland; and (4) the Yoredale Rocks, which as yet have not been referred to here.

The Yoredale Rocks, which succeed the Mountain Limestone, consist of a series of alternations of beds of limestone, with beds of sandstone, shale, chert, and *coal*. These are the rocks that constitute the greater part of the so-called Mountain Limestone in North Cumberland, in Scotland, and especially along the Pennine Escarpment. Most of the dales of North-West Yorkshire have been carved out of the same rocks.

Their geological history forms a continuation of that described under the Mountain Limestone. The chief difference between the two lies in the fact that the individual limestones forming the most conspicuous members of the Yoredale Rocks, are even more persistent than the beds of the Mountain Limestone proper. On this account each bed of limestone has received a definite name, which is recognized by miners and others over many hundreds of square miles, from North Yorkshire through Westmorland, Durham, Cumberland, and Northumberland. These limestones, being so persistent, can be traced over a very large area; and we now know that, north of an east and west line through, say, Penrith, most of the Lower Carboniferous Limestones appertain, not to the Mountain Limestone properly so called, but to the higher subdivision known as the Yoredale Rocks.* The individual beds of Yoredale Limestone thin slightly towards the north, but the rate of thinning is so

* The Yoredale age of the Carboniferous Limestones of North Cumberland was determined by the writer nearly twenty years ago, and has been repeatedly communicated without reserve to various fellow-workers; one of whom, in publishing the information, has virtually claimed the discovery as his own.

gradual that it can only be detected by comparing the thicknesses of these rocks at points widely separated. Each bed of limestone, as a rule, is based upon a bed of sandstone, which often bears a coal seam, and the limestone, in its turn, is almost invariably succeeded by more or less shale. In the eastern part of the district these drifted materials are thicker than they are to the west; the proportion being four or more of sediment to one of limestone on the east, three of sediment to one of limestone on the western side of the Eden, while as the rocks are traced round the north side of the Lake District towards the Whitehaven area the Yoredale sediments, as Mr. J. D. Kendall pointed out some years ago (and was well known long previously to those who mapped the district, Mr. Colvin, Mr. Ward, and the author), gradually become thinner and thinner, until eventually we reach a point where the limestones of the Yoredale Series, from the Great, Main, or Twelve Fathom Limestone, downward, have nearly coalesced into one undivided mass of limestone. The top of the Lower Yoredales is thus made to appear as the top of the Mountain Limestone; which, however, is almost entirely absent in North-West Cumberland. The very same feature is observable in the very same beds in the eastern part of the Craven area. The obvious explanation in both cases is that the areas where the limestones were deposited without intermixture with materials of sedimentary origin were, all through the period they represent, areas of *clear* water. How that fact is compatible with the existence of islands and mountains, etc., on the same spot must be left to others to explain.

The normal succession of the Yoredale Rocks is as follows; the highest beds being stated first, and the local names given in square brackets:—

Millstone Grit, with several coals of workable thickness and quality.

Yoredale Rocks. (1) Upper Section:—

Thickness about 500 feet, beds very persistent everywhere, and not subject to the westerly thinning that affects the sedimentary beds belonging to the Lower Section:—

Sandstones and shales, with coal [Tanhill Seam] to 4 feet in thickness.

Shales with [Fell Top] Limestones.

Shale.

Limestone, [Crag Limestone of Alston, Crow Limestone and Chert, of Yorkshire.]

Sandstone (with two or more coals locally worked), [Firestone, Ten Fathom Grit.]

Shale.

Limestone, [Little Limestone, Red Beds Limestone and Chert.]

Coarse grits [Coal Sills] with a very constant seam of coal, [Tindal Fell Seam] to 4 ft. 6 in.

Shales, and cherts.

Yoredale Rocks. (2) Lower Section :—

Thickness ranging from 500 in the west to 1200 on the east:—

Limestone [Main, Twelve Fathom, or Great, Limestone.]

Coal, sandstone, shale.

Limestone Post = Upper Undersett of N.W. Yorkshire.

Coarse Grit [the Quarry Hazel, of Alston.]

Shales.

Siliceous limestone (i.e. containing organic silica, and not *sand*) Four Fathom [or Lower Undersett Limestone.]

Sandstones and shales, thinning westward.

[Three Yards] Limestone, persistent.

Sandstones and shales, thinning westward.

[Five Yards] Limestone, persistent.

Sandstones and shales, thinning westward.

[Scar] Limestone [= Middle, or Fourth Sett,] persistent.

Sandstones, persistent coal, and shales, thinning westward.

Two thin, but very persistent, limestones [Cockle Shell, and Post.]

Sandstones and shales, thinning westward.

[Tyne Bottom, Simonstone, or Fifth Sett, Limestone] persistent.

Sandstones, shales, and some thin limestones, the two former thinning westward.

[Hardra Limestone, Jew, or Sixth Sett] persistent.
Sandstones and shales, thinning westward.

[Top of the Mountain Limestone, already referred to as thinning steadily toward the north-west, and passing into the Calciferous Sandstone Series towards the north and the north-east.]

CONSTITUTION OF THE LIMESTONES.

This varies to some extent; but in the main the organic constituents of the Mountain Limestone may be said to be Brachiopods, Mollusca, Foraminifera, some Polyzoa, and Corals. Of the corals not a single case anywhere can be demonstrated to be of the nature of a *reef*. Coral *stools* there are, and in abundance, especially around Kendal; but of *reefs*, or anything approaching reefs, there are none. Indeed it is doubtful if any case of a pre-tertiary coral reef has yet been made out.

The constituents of the Yoredale Limestones are much the same as those of the limestones below, except that the percentage of mollusca entering into their composition is higher, and that Encrinites in these beds sometimes form nearly the entire organic constituents of masses of vast extent. Spirorbis also occurs on many horizons.

In some of the higher limestones of the Yoredale Rocks sponge spicules occur in large numbers, whereby the rocks are often found to be largely replaced by silica. That is to say, they are *siliceous* (not *arenaceous*).

In the true Millstone Grit thin beds of more or less earthy limestone (which probably represent ironstones and coals towards the north-west) occur at many places in eastern and south-eastern Westmorland.

In the Coal Measures proper (seen in Argill, near Brough) similar beds of impure, chemically-formed, limestone occur. In both this case and that of the Millstone Grit, these impure limestones may represent middle terms between coals towards the north-west, and thicker limestones of organic origin towards the south-east. It is far from unlikely, considering the nature of the

changes the whole of the Carboniferous rocks undergo as they are traced from N.W. to S.E., that some of these thin impure limestones may represent the thin edges of beds of limestone of Upper Carboniferous age, which occur in Belgium and other areas to the south-east. We have too long regarded the advent of the North of England Millstone Grit as marking the close of the Carboniferous Limestone. Yet the deposition of limestone must have gone on even into Coal Measure times, only that the area of deposit was carried, by the gradual advance of the delta, farther and farther towards the south-east as time went on. If these Belgian Carboniferous Limestones be regarded (as suggested here for the first time) as being contemporaneous with the British Millstone Grit and Coal Measures, it would serve to explain the marked discrepancy between the faunas of the limestones in the two areas. The difference would be due, not so much to different conditions, as to difference in age.

Of the remaining limestones of Cumberland and Westmorland not much need be said here. Long after all the Carboniferous rocks were formed they underwent much disturbance, upheaval, and denudation; and part of the Lake District was for a time temporarily exposed. Upon the upturned edges of the older strata were afterwards laid down in succession (1) the Lower New Red, (2) the Magnesian Limestone, (3) the Upper New Red, including the Lower Gypseous or Bunter Marls, the St. Bees and Kirklington or Bunter Sandstones, and the Keuper or Stanwix Marls. Later on, ferriferous and magnesian solutions, percolating downward into the older rocks from these Red Rocks, gave rise to the *dolomitization* of many of the older calcareous deposits; and at the same time, replaced much of the calcareous matter by HÆMATITE. This process may even be going on now.

After the deposition of the Red Rocks, whose higher members certainly overspread the newly-exposed Lake District, followed the Jurassic period. Rocks of this age almost certainly overspread the whole of the North of England, Ireland, and the South of Scotland. The Lias Limestone of Great Orton is the last remnant of these undened.

Then followed a third period of extensive denudation, and the Cretaceous rocks were laid down, to be, in their turn, denuded away in late Tertiary times.

Finally came the great period of elevation, when the mountain masses were slowly brought up to a position higher above the sea than they have at present. Then it was that thermal springs, connected with the waning volcanic action of the period, carried up the minerals that now fill the metalliferous veins. In connection with these, limestones, as in the case of the hæmatite deposits, play a most important part.

Later still came the great Glacial episode, which resulted in the removal of enormous quantities of rock from the areas under notice, and which, in doing so, shaped the limestones of the district into surface forms quite different from what they would have taken under ordinary atmospheric denudation.

Then, later, subaerial denudation reasserted its sway upon the limestones, and is etching and wearing them into something like their preglacial forms.

ADDITIONAL NOTES ON
THE LAND AND FRESH-WATER SHELLS OF
CUMBERLAND AND WESTMORLAND.

BY C. W. SMITH, PENRITH,

IT may be interesting to note a few localities, not before recorded, for a few of the more uncommon species:—

Unio margaritifera, L. River Lowther, the finest specimen being obtained near Askham.

Anodonta cygnea, L. In Old Eden, near Great Salkeld, they seem to approach the var. *incrassata*, as the shell is more swollen and solid.

Planorbis nautilicus, var. *cristata*. Edenhall Pond.

Linnæa peregrina, var. *candida*. In a stream near Edenhall. These shells were identified for me through the kindness of Mr. George Roberts, of Lofthouse.

L. palustris, var. *tinctoria*. Pond, near Langwathby.

L. palustris m. decollatum, Jeff. Langwathby.

L. glabra. Müll. I have found this somewhat rare mollusc in a pond near Calthwaite railway station, where they are fine and abundant.

Helix aculeata, Müll. Near the Iron Bridge, Tirril.

H. arbustorum, var. *minima*, Pfr. Edenhall.

H. pulchella, Müll. This small shell is very plentiful on the limestone at Red Hills, near Penrith, and associated with *Bulimus obscurus* and *H. caperata*.

Vertigo pygmaea, Drap. Red Hills, Penrith.

Clausilia rugosa, var. *tumidula*. A few specimens at Red Hills, Penrith.

C. laminata, Mont. On the Yoredale limestones in a wood near Melkinthorpe, Westmorland.

Cochlicopa tridens, Pult. I have only found this shell on the banks of the River Leith, near Hackthorpe.

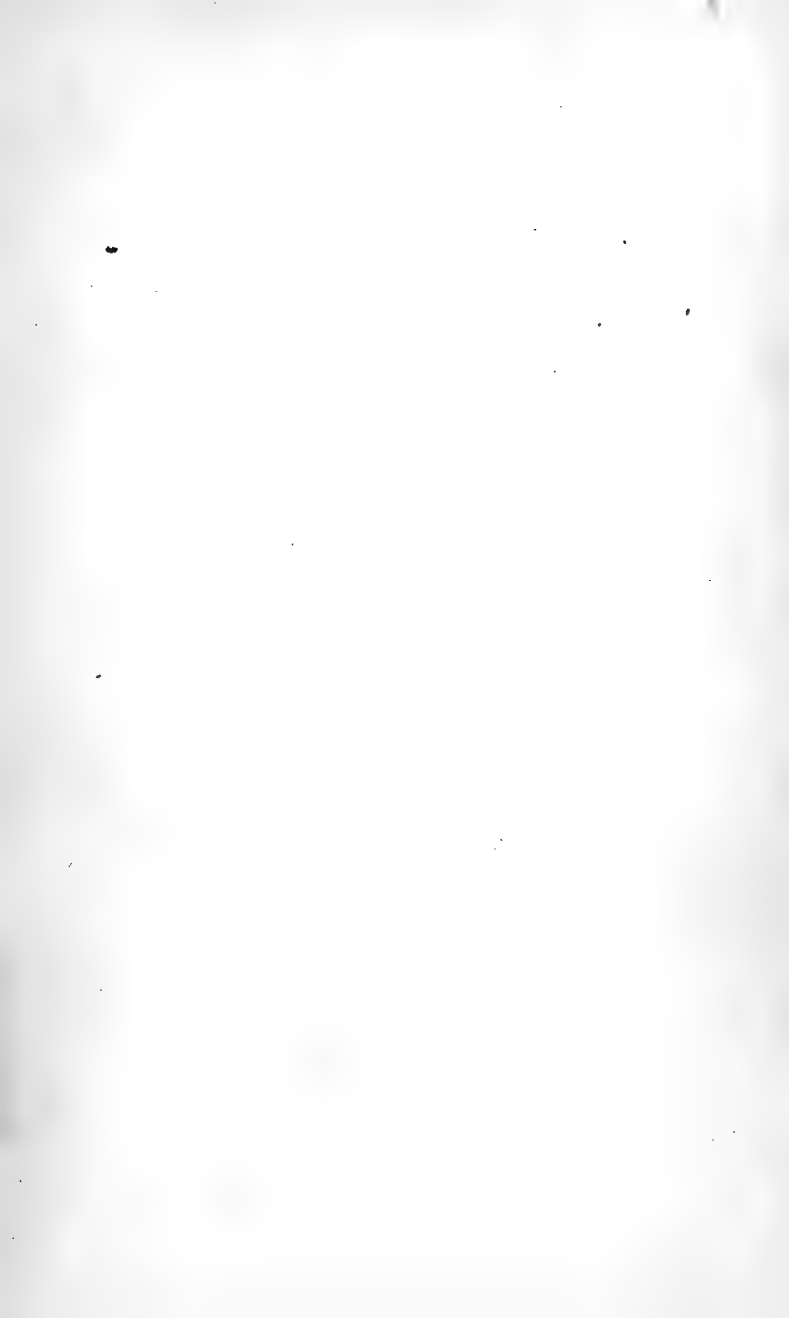
var. *crystallina*, Dupuy. With the type form, near Hackthorpe.

Balia perversa, L. This scarce shell occurs on the limestone walls near Newton, and at Melkinthorpe, Westmorland.

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