Yorkshire Philosophical Society.

ANNUAL REPORT

FOR

MCMIV.

BRITISH MUSEUM
NATURAL HISTORY

ANNUAL REPORT

OF THE COUNCIL

OF THE

YORKSHIRE

PHILOSOPHICAL SOCIETY

FOR

MCMIV.

PRESENTED TO THE ANNUAL MEETING,

FEBRUARY 13TH, 1905.

BRITISH MUSEUM
NATURAL HISTORY

YORK:
COULTAS & VOLANS, PRINTERS, LITTLE STONEGATE,
1905.

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THE YORKSHIRE MUSEUM,

APPOINTED BY ROYAL GRANT,

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Geology	J. F. Walker, M.A., F.G.S.
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KEEPER OF THE MUSEUM:

Oxley Grabham, M.A., M.B.O.U.

REPORT OF THE COUNCIL

OF THE

YORKSHIRE PHILOSOPHICAL SOCIETY.

FEBRUARY 13TH, 1905.

IN presenting the Annual Report for the year 1904, the Council feels that it has every reason to congratulate the members upon another successful year's work.

The Lectures have been maintained at a high standard, and the attendance has been consistently good: a list of the Lectures will be found at page 9.

The Report for the year 1903 closed with a statement that the question of an invitation to the British Association to visit York at an early date had been before the Council, and that it was hoped that some further steps might be taken shortly. This hope has been realised. A deputation from the Philosophical Society waited upon the York Corporation on the 6th of June, the matter was most favourably entertained by the Lord Mayor and Council, and as a result an invitation was sent both by the City Council and your Society, that the meeting of the British Association for the year 1906 should be held at York. This was further emphasised by a joint deputation attending at the Cambridge Meeting of the British Association in August last, and the invitation was cordially accepted.

There is a peculiar fitness in the meeting being held at York in 1906. The British Association was founded in our ancient city in 1831, by the then representatives of your Society.

Its Jubilee was celebrated at one of its most successful meetings here in 1881, and its 75th Anniversary falls in the year 1906. Local Secretaries and Treasurer have already been appointed, and a Committee is now engaged in the preparation of a Guide Book for use at the meeting. Your Council trusts that every member of the Yorkshire Philosophical Society will do his utmost to render the meeting an unqualified success. It may be mentioned that during the past year a scheme was introduced by the Educational Authority for the city for converting the Exhibition Buildings into a Secondary School, and your Council, recognising that such a conversion was not only a direct contravention of the terms of the lease by your Society, but would also deprive the city of its most spacious and useful hall, were compelled to point this out to the Educational Authority, and your Council considers that your Society may congratulate itself upon the result. The scheme was withdrawn. It is not too much to say that without the large hall of the Exhibition it would hardly have been possible to hold the British Association Meeting in the city.

Turning to the internal affairs of your Society, towards the close of last year, Mr. H. M. Platnauer, who, since the year 1883, has filled the position of Keeper of the Museum, intimated to the Council that he wished to resign that position, and that his future connection with your Society should be of an honorary character.

Your Council cannot too highly appreciate the valuable services which have been rendered by Mr. Platnauer during the long period he has been so closely connected with your Society. They rejoice that this connection will not, by his resignation, be severed, but that he is still prepared to join in the deliberations of your Council and to assist his successor, Mr. Oxley Grabham, in his duties as Keeper of the Museum. Your Council have much pleasure in recommending that in recognition of his past services, Mr. Platnauer should be elected to fill a vacancy in the office of Vice-President of your Society.

In appointing Mr. Oxley Grabham, your Council have secured a well known Naturalist, and it is hoped that his special knowledge of Zoology and Ornithology will prove of

great value in improving and supplying fresh specimens to your collection.

The financial position of the Society for the period under review is not quite so satisfactory. The income for the year from all sources is £1228 18s. 9d., and the expenditure £1242 13s. 9d., shewing a deficiency of £13 15s. 0d. Both the income and expenditure are less than the previous year when the figures were, income £1291 and expenditure £1288, but in that year there were special donations towards the cost of excavations, and the hire of the tent which that year produced a substantial sum, has this year not only produced nothing, but owing to cost of repairs has caused a deficit. The Corporation have also withdrawn the Meteorological grant of £10 a year. This small deficiency is, however, easily met out of the balance in the hands of the Treasurer. The amount remaining due to the Yorkshire Insurance Company is £1646 7s. 10d.

During the past year your Society sustained a heavy loss by the death of the Rev. Wm. Haworth, F.S.A., one of its most valued and useful Vice-Presidents and joint Curator of Archæology. Canon Haworth took a deep interest in all that concerned your Society. He often presided at its meetings, and was a generous contributor both to its collections and funds.

Your Council recommend the appointment of Mr. C. Wakefield as Curator of Antiquities in the place of the Rev. Wm. Haworth.

Pastoral Plays were again performed in the Museum Gardens by Miss Tellek's Company during the past summer, and the Band of the York Philharmonic Society gave several performances.

Meetings of kindred Societies have been held from time to time during the past year in the Theatre of the Museum.

An effort is being made to render the Gardens more educationally useful from a Botanic point of view, and a scheme has been drawn up for treating that portion of the garden between the Hospitium and the River as a Botanic Garden under the direction of Mr. H. J. Wilkinson, the Curator of Botany, assisted by the Rev. J. J. Briggs.

A plan of the Grounds and Antiquities for the use of visitors has been prepared, thanks to the efforts of Mr. Malcolm Spence and Mr. Cotsworth, and every endeavour has been made to render the Garden and Museum more useful and attractive.

We have lost by death eleven members, by resignation thirty—but the numbers have been kept up by a corresponding increase in new members.

The attention of members is drawn to the importance of local observations, in various branches of science, in connection with the Corresponding Societies' Committee of the British Association.

The lectures delivered on Thursday evenings were as follows:—

Thursday, Jan. 14th.—"A Tour in Bosnia and Dalmatia" (with Lantern Illustrations). By Miss H. M. Bicknell.

Thursday, Jan. 28th.—"Mountains and Fiords of Arctic Norway" (with Lantern Illustrations). By G. Hastings, F.R.G.S. (Member of Alpine Club).

Thursday, Feb. 11th.—"Ingleborough, its Scenery, Geology, and underground Waters" (with Lantern Illustrations from Photographs taken by the Lecturer). By A. R. Dwerryhouse, M.Sc., F.G.S.

Thursday, Feb. 25th.—"Life and Times of an Old Italian Master" (with Illustrations). By Miss M. M. Paget.

Thursday, March 10th.—"Norway" (Illustrated by Lantern Pictures from Photographs taken by the Lecturer). By W. H. Macnamara.

Thursday, March 24th.—"Among the Chateaux of the Loire" (Illustrated by Lantern Pictures from Photographs taken by the Lecturer). By the Rev. T. Gough, B.Sc.

Thursday, April 14th.—The Members of the Photographic Section gave a Lantern Night.

Thursday, Oct. 6th.—"Readings from Shakespeare (*Julius Cæsar*)." By the Rev. Canon Fleming, B.D.

Thursday, Oct. 20th.—"Morocco and the Moors" (illustrated by Original Lantern Pictures). By E. Solley, M.D.

Thursday, Nov. 3rd.—"The First Men in Britain" (Illustrated by Lantern Pictures). By Professor Percy F. Kendall, F.G.S.

Thursday, Nov. 17th.—"The Lipari Islands and their Volcanoes" (Illustrated by Original Lantern Pictures). By Tempest Anderson, M.D., B.Sc.

Thursday, Dec. 1st.—"The Building of the Pyramids" (Illustrated by Lantern Pictures). By Prof. Goodman, M.Inst.C.E., M.I.Mech.E.

ARCHÆOLOGY.—The work in this department has necessarily suffered from the loss of its Honorary Curator, the Rev. W. Haworth, F.S.A. A fuller reference is made elsewhere in this Report to that active and useful officer of the Society, it is sufficient here to say that his loss will be especially felt in the department of Antiquities. As far as the acquisition of Antiquities is concerned, the year has been an uneventful one. A considerable number of specimens has, it is true, been obtained; but nothing of an unusual character or calling for special notice. Our collection of Tokens, which has long needed attention, has been taken in hand by Mr. Chas. Wakefield, who has not only cleaned and arranged the specimens, but has filled up many gaps from tokens in his own collection. A considerable amount of work necessary for safeguarding the ruins of the nave of S. Mary's Abbey Church has been done, under the able and careful supervision of Mr. Geo. Benson—to whom the Society is greatly indebted for the care and attention he has bestowed upon the matter. Our members will learn with pleasure that Mr. Chas. Wakefield has been appointed one of the Honorary Curators of this Department.

BOTANY.—The Curator reports that the collections are in good order, and that the additions to the Herbarium consist of the following flowering plants:—

Trifolium ochroleucum, *L.*, and other plants from Norfolk, collected and contributed by F. H. Weekes.

Also a specimen of *Fumaria occidentalis, Pugsley*, contributed by Arthur Bennett.

Geology.—The Honorary Curator reports that during the past year that Herr Dr. Pfarrer Engel has presented to the Museum a collection of Muschelkalk fossils; also some Tertiary fossils from Germany.

The following specimens have been lent from the collection: *Cretaceous Limas*, to Hy. Woods, F.G.S.

Ammonites from the Kelloway Rock, to Miss Healey; and 7 bivalves from the Cornbrash, to Prof. Blake.

The following specimens have been figured by Mr. Woods: *Lima intermedia, Lima canalifera, Lima semiornata.*

No specimens have been added to the Yorkshire Geological collection.

Ornithology.—The Honorary Curator for the Ornithological Department reports that during the past year, Mr. Chubb (of the British Museum) finished his examination of our collection of Foreign Birds, and his determination of the species contained in it. It was decided that the best way of utilizing the collection, with the small amount of space at our disposal, was to arrange the birds so as to illustrate Geographical Distribution.

The six well-known provinces of Dr. Sclater were adopted as forming a simple and intelligible division, and one that accorded with the majority of elementary text books dealing with the subject.

A general introductory label, illustrated by a tinted map, has to be set up, and the birds of the Australian Region have been selected and arranged, and the task of labelling them has been commenced. It is hoped that before long the whole series will be arranged and furnished with descriptive labels on the same lines.

We have also had a series of skins presented by the Departmental Curator, representing the Shrike family throughout the world and several of their near allies. Although not by any means complete as to the species known to science, the collection is a large and fine one, and contains many rarities, such

as *Lanius sphenocercus, L. fuscatus, L. Dodsoni, Prionops poliocephalus* (brought from Central Africa by the late Emin Pasha), &c. There are some 400 specimens in all.

Nothing of moment has been added to the Yorkshire collection during the year.

LIBRARY.—The Library has received numerous accessions during the past year, chiefly through the kindness of various scientific societies. The Trustees of the British Museum continue their generous system of sending works on Natural History to this Museum as they are issued. We have again to record the presentation of a work issued by the Geological Society to this Society's Library. It would seem that our Government has at length awakened to the desirability of letting public institutions benefit by the result of work executed at public cost. If so, we may congratulate the permanent officials of the Government and ourselves. Regretfully we have to point out the rapidly diminishing space left for acquisitions to the Library. A very few years will see the room exhausted.

MINERALOGY.—The collections are in good order. The only additions during the past year, are a specimen of Calcite presented by Mr. Milburn, and a specimen of Coal from Westport, New Zealand, presented by Mr. Machell.

METEOROLOGY.—*Statistics of Station* :—Longitude 1° 5′ W.; Latitude 53° 57′ N.; height above mean sea level 56 feet.

Temperature in 1904 had the same range as in 1903. the average mean temperature being again higher by ·5°F., viz., 48·5° as against 48°. The lowest temperature was recorded on Dec. 23rd, when the absolute minimum thermometer read 19°F., whilst the highest reading, 80°F., was observed on three days, viz., July 11, Aug. 29-30.

The spring of the year was cold and wet, even more so than 1902, and the effect upon the general health of the community was undoubtedly adverse. Yet from the commencement of June the conditions were on the whole most favourable, and a splendid month in October must have helped many to face the winter with equanimity. Fogs have been rather frequent

during the year, and their occurrence with anti-cyclonic conditions in winter ought to be so well known, that no railway company should be found unprepared for them.

A *Mean Pressure* of 29·934 inches at normal temperature and mean sea level has been recorded as against 29·863 inches for 1903. February being much the lowest with 29·533 inches, September and June being highest with 30·072, and 30·042 inches respectively. The extreme range of pressure was 2·041 inches as compared with 1·790 inches in 1903, the highest reading being taken on Jan. 22nd, 30·723 inches at 9 a.m. and the lowest, 28·662 inches on Feb. 9th at 9 p.m. This increase of the general average of barometric pressure marks the improvement of weather conditions, especially in the latter part of the year.

Rain or Snow (0·005 inches or more) fell on 189 days, an acceptable reduction of 29 rainy days on the number for 1902, the total rainfall for 1904 being only 20·82 inches as against 30·31 inches for 1903, a diminution of 9·49 inches for the year, almost bringing the annual rainfall to the low record of 1902, 18·69 inches. The heavy rainfall of the year occurred in the early months, causing much difficulty in dealing with the land which became soaked and rotten with the excessive moisture. Yet the annual fall was 3·68 inches below the average for the last 60 years. The wettest months for the year were August, May and February, in order of merit, with 3·09, 2·56, 2·34 inches respectively.

The cumulative totals since 1841 are now:—August 171·39 inches, October 172·60 inches, July 162·01 inches. October, which last year was our wettest month, giving only ·70 in. as compared with 6·95 in 1902. The observations of the winds show that on 4 days of the year the wind blew with the force of a "gale," while the chief air-currents S. (189): W. (169): N. (97): S.W. (88), 16 days being "calm." Days of "clear" sky reach only 35, as against 38, "overcast" are 117 as compared with 125 (·03) and 142 (·02), the mean amount of cloud being 6·1 as compared with 6·4.

Sunshine has been recorded continuously throughout the year, and the general improvement in the weather conditions

of the year may be inferred from the number of hours of bright sunshine, viz., 1241·9 as against 1162·5 hours for 1903, or 28 % for the year, an increase of 2 % in 1903.

Photographic Section.—The membership of this Section and the attendance at its meetings has been well maintained during the past year. The advantages of joining the Photographic Section deserve to be more widely known to those belonging to the general Society who practice the art of photography, without belonging to any regular Photographic Club or Society.

The Section does not depend only upon the work done by its own members, but enjoys the further privilege of being one of the Affiliated Photographic Societies, so that much of the work contributed by the numerous other incorporated societies is available for the Section's meetings.

During the year Mr. M. Spence, one of the Hon. Secs., gave demonstrations to beginners, and Mr. Bellerby a similar series in Carbon printing to more advanced workers.

The Lantern Exhibitions given each Spring in the Museum Theatre always seem to be popular, and large audiences are proof of the interest aroused in the Section's work. The terms of subscription are,—for Members and Associates of the Philosophical Society, 2/6 per annum : and for Non-members of the same, 5/- per annum. Any lady or gentleman wishing to join has merely to enclose the subscription, and to intimate his or her desire to become a member to either of the joint Hon. Secretaries.

H. Dennis Taylor, Stancliffe, The Mount. or Malcolm Spence, Almery Garth, Marygate.

METEOROLOGICAL STATION, YORK.—THE MUSEUM.

Longitude 1° 5′ W., Latitude 53° 57′ N. Height above Mean Sea Level 56 ft. Gravity Correction + ·024 in.

1904.	Mean Pressure at 32° Fahrenheit.		Air Temperature.										Humidity.									Earth Temp.	
	At M.S. Level	At Station Level.	9 a.m.	9 p.m.	Mean.	Means of		Min. & Max. Combined.	Absolute Min. and Max.				Deprn. of Wet Bulb.			Tension of Vapour.			Percentage.			At 1 ft.	At 4 ft.
						Min.	Max.		Min.	Day.	Max.	Day.	9. a.m.	9 p.m.	Mean.	9 a.m.	9 p.m.	Mean.	9 a.m.	9 p.m.	Mean.		
	ins.	ins.	°	°	°	°	°	°	°		°		°	°	°	in.	in.	in.	%	%	%	°	°
Jan.	29·861	29·801	38·5	39·3	38·9	35·0	44·2	39·6	28·0	22, 21	53·0	28th	0·7	0·8	0·8	·219	·225	·222	94	94	94	38·4	41·8
Feb.	·533	·474	36·9	37·3	37·1	34·0	42·2	38·1	28·0	19, 29	53·0	21st	0·8	0·9	0·9	·203	·205	·204	93	93	93	38·5	40·9
Mar.	·991	·931	38·7	39·3	39·0	34·0	45·5	39·8	27·0	1st	58·0	20th	1·2	1·1	1·2	·212	·219	·216	91	92	92	39·0	40·4
April	·857	·798	48·2	46·7	47·5	41·7	55·4	48·6	36·0	12, 26	64·0	18th	2·9	2·2	2·6	·268	·268	·268	80	85	83	45·3	43·7
May	29·914	·856	52·5	50·5	51·5	43·6	59·5	51·6	37·0	8, 10	73·0	26th	3·4	2·8	3·1	·307	·297	·302	78	81	80	50·7	47·8
June	30·042	·985	57·5	53·9	55·7	48·1	64·4	56·3	42·0	3rd	76·0	29th	4·2	2·2	3·2	·354	·354	·354	75	86	81	55·7	52·1
July	30·017	·960	63·4	59·7	61·6	53·7	71·0	62·4	45·0	8th	80·0	11th	4·6	2·9	3·8	·433	·422	·428	74	83	79	60·4	55·7
Aug.	29·969	29·912	60·7	57·8	59·3	51·4	67·7	59·6	40·0	21st	80·0	29, 30	3·4	2·3	2·9	·423	·410	·417	80	85	83	60·0	57·8
Sept.	30·072	30·015	55·6	53·2	54·4	47·2	61·0	55·6	37·0	28th	73·0	5th	2·0	2·2	2·6	·360	·344	·352	81	85	83	56·8	56·5
Oct.	·077	30·019	48·5	48·2	48·4	42·5	57·1	49·8	28·0	15th	66·0	19th	1·9	1·5	1·7	·291	·300	·297	86	90	88	51·0	53·1
Nov.	30·000	29·940	41·4	41·3	41·4	36·9	47·1	42·0	23·0	24th	59·0	9th	1·6	1·2	1·4	·228	·234	·231	88	91	90	45·0	49·0
Dec.	29·872	29·812	37·8	37·9	37·9	33·3	43·0	38·2	19·0	23rd	56·0	4, 17	0·9	0·9	0·9	·210	·209	·210	93	92	93	39·5	44·0
Year	29·931	29·875	48·3	47·1	47·7	41·8	55·1	48·5	19·0	Dec. 23rd	80·0	July 11 Aug. 29, 30	2·1	1·8	2·1	·293	·291	·292	84·1	88·1	86·3	48·4	48·6

STATION, YORK.—THE MUSEUM.

Heights above Ground :—Barometer, 3 feet ; Thermometers, 4 feet ; Rain-gauge, 1 foot.

1904.	Amount of Cloud.			Rainfall.			Weather. No. of Days of									Wind, No. of Observations of								
	9 a.m.	9 p.m.	Mean	Total.	Max.	Day.	Rain.	Snow.	Hail.	Thunder Storm	Clear Sky.	Over-cast.	Fog.	Gale.	Strong (Wind 4-7)	N.	N.E.	E.	S.E	S.	S.W	W.	N W	Calm.
				ins.	ins.																			
Jan.	7·5	7·6	7·6	2·06	·61	7th	17	0	0	0	2	16	6	0	3	2	1	0	7	23	9	9	9	2
Feb.	7·1	7·3	7·2	2·34	·55	3rd	23	5	0	0	2	14	3	0	3	12	0	6	5	14	9	6	6	0
Mar.	6·6	6·5	6·6	1·49	·41	7th	20	5	0	1	2	12	4	0	0	16	7	6	2	14	5	4	5	3
April	6·5	5·4	6·0	1·71	·71	14th	15	0	0	0	2	9	1	3	15	5	2	1	0	12	8	27	5	0
May	6·5	6·7	6·6	2·56	·62	27th	15	0	0	2	0	13	1	0	3	13	1	3	6	15	8	11	4	1
June	5·4	5·9	5·7	0·83	·26	24th	8	0	0	1	4	9	1	0	3	8	12	2	3	9	3	17	6	0
July	6·0	5·7	5·9	1·85	·61	23rd	12	0	0	2	5	8	2	0	0	3	3	7	7	16	8	16	2	0
Aug.	5·1	4·9	5·0	3·09	1·05	17th	13	0	0	1	4	4	0	0	4	5	0	1	3	16	8	21	8	0
Sept.	5·4	4·6	5·0	1·15	·55	30th	11	0	1	0	5	5	4	0	0	8	3	4	6	21	3	11	3	1
Oct.	5·2	5·1	5·2	0·70	·27	6th	8	0	0	0	6	6	3	0	2	9	1	1	4	19	12	13	3	0
Nov.	6·4	6·4	6·4	1·66	·63	7th	16	4	1	0	0	10	3	0	1	11	2	0	0	8	5	25	7	2
Dec.	6·9	5·9	6·4	1·38	·26	11th	16	1	0	0	3	11	11	1	2	5	0	2	0	22	10	9	7	7
Year	6·2	6·0	6·1	20·82	1·05	Aug. 17	174	15	2	7	35	117	39	4	36	97	32	33	43	189	88	169	65	16

RIVER HEIGHT RECORDS REGISTERED BY THE AUTOMATIC RECORDER AT THE GUILDHALL, YORK, 1904.

Date.	JANUARY.			FEBRUARY.			MARCH.			APRIL.			MAY.			JUNE.		
	Time.	Above or below S.L.		Time.	Above or below S.L.		Time.	Above or below S.L.		Time.	Above or below S.L.		Time.	Above or below S.L.		Time.	Above or below S.L.	
		ft.	in.		ft.	in.		ft.	in.		ft.	in.		ft.	in.		ft.	in.
1	noon	0	8	12 p.m.	3	2	1 a.m.	0	11	2 a.m.	0	11	noon	1	2	12 p.m.	2	10
2	,,	0	8	,,	1	10	noon	0	8	6 p.m.	1	1	12 p.m.	1	6	2 a.m.	2	11
3	,,	0	8	4 p.m.	2	1	12 p.m.	1	3	12 p.m.	3	6	6 a.m.	2	2	1 a.m.	0	10
4	,,	0	7	12 p.m.	4	4	2 p.m.	1	6	1 a.m.	3	8	1 a.m.	0	10	8 a.m.	S.L.	
5	,,	0	11	,,	2	4	1 a.m.	1	4	6 p.m.	1	7	12 p.m.	0	5	1 a.m.	0	3
6	,,	0	10	3 a.m.	2	4	,,	0	10	12 p.m.	6	6	,,	0	5	noon	below 2	9
7	12 p.m.	1	7	1 a.m.	1	11	noon	0	8	,,	1	10	9 a.m.	0	8	River	drawn off.	
8	4 p.m.	6	7	12 p.m.	2	0	12 p.m.	2	7	11 a.m.	1	4	12 p.m.	0	10	,,	,,	
9	1 a.m.	5	6	11 a.m.	2	9	9 a.m.	2	8	noon	0	10	,,	1	9	,,	,,	
10	noon	2	11	12 p.m.	2	2	,,	2	8	,,	1	1	,,	1	0	,,	,,	
11	10 a.m.	4	8	,,	1	4	2 a.m.	2	6	1 a.m.	1	0	10 a.m.	0	9	,,	,,	
12	1 p.m.	4	2	,,	0	10	1 a.m.	1	9	,,	0	9	1 a.m.	1	0	,,	,,	
13	12 p.m.	4	9	6 p.m.	6	6	,,	1	9	noon	0	8	,,	0	8	9 a.m.	S.L.	
14	1 p.m.	6	3	12 p.m.	8	0	6 p.m.	2	8	12 p.m.	1	3	noon	0	6	,,	0	1
15	1 a.m.	5	10	noon	8	3	1 a.m.	2	6	1 p.m.	3	3	,,	0	5	,,	0	5
16	,,	3	4	1 a.m.	6	9	4 p.m.	1	6	1 a.m.	2	8	6 p.m.	0	2	,,	0	7
17	,,	1	6	,,	3	2	12 p.m.	1	6	,,	2	1	noon	0	2	,,	0	5
18	12 p.m.	1	9	noon	2	10	,,	1	5	,,	1	0	,,	0	2	,,	0	6
19	noon	2	6	,,	2	10	,,	1	7	,,	0	10	,,	0	2	,,	0	6
20	1 a.m.	1	10	,,	2	9	8 p.m.	2	7	,,	0	9	,,	0	1	,,	0	6
21	,,	1	2	4 a.m.	5	3	noon	2	9	noon	0	6	,,	0	1	,,	0	4
22	,,	1	2	4 p.m.	5	0	12 p.m.	1	0	,,	0	6	,,	0	1	,,	0	4
23	noon	0	11	1 a.m.	4	4	6 p.m.	1	9	12 p.m.	0	9	1 a.m.	0	1	,,	0	3
24	,,	0	10	noon	1	2	1 a.m.	1	1	6 a.m.	0	11	noon	S.L.		,,	0	5
25	1 a.m.	0	10	1 a.m.	1	2	noon	0	10	1 a.m.	0	9	,,	S.L.		,,	0	3
26	,,	0	8	noon	0	11	,,	0	4	noon	0	6	12 p.m.	0	8	,,	0	6
27	12 p.m.	1	5	,,	1	1	,,	0	9	,,	0	5	9 p.m.	0	5	,,	0	8
28	8 p.m.	4	11	10 p.m.	0	8	1 a.m.	0	9	,,	0	4	3 p.m.	4	0	,,	0	6
29	1 a.m.	4	10	noon	1	0	12 p.m.	3	2	12 p.m.	1	8	1 a.m.	3	3	,,	0	4
30	,,	2	4				10 a.m.	3	4	,,	1	2	8 a.m.	S.L.		,,	0	1
31	12 p.m.	2	3				8 a.m.	0	6				12 p.m.	0	1			

RIVER HEIGHT RECORDS.—*Continued.*

Date.	JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.	Time.	Above or below S.L.
		ft. in.		ft. in.		ft. in.		ft. in.		ft. in.		ft. in.
1	9 a.m.	0 1	noon	S.L.	noon	below 0 3	noon	0 2	noon	below 0 2	9 p.m.	3 0
2	noon	S.L.	,,	S.L.	,,	0 3	3 p.m.	0 6	..	0 2	12 p.m.	2 3
3	,,	S.L.	,,	S.L.	,,	0 3	1 a.m.	0 6	,,	0 1	5 p.m.	0 8
4	,,	S.L.	,,	S.L.	,,	0 3	noon	0 3	,,	0 1	6 p.m.	0 3
5	,,	S.L.	1 a.m.	S.L.	,,	0 2	,,	0 2	,,	0 2	noon	3 0
6	6 p.m.	0 3	12 p.m.	0 2	,,	0 3	12 p.m.	0 5	,,	0 2	1 a.m.	2 5
7	1 a.m.	0 3	,,	S.L.	,,	0 4	noon	0 8	7 p.m.	above 0 1	noon	1 5
8	noon	S.L.	,,	0 3	,,	0 4	,,	0 7	10 p.m.	1 10	9 a.m.	0 9
9	1 a.m.	S.L.	8 p.m.	S.L.	,,	0 4	,,	0 6	12 p.m.	5 9	1 a.m.	0 11
10	noon	S.L.	noon	0 1	,,	0 4	,,	0 3	8 a.m.	7 1	12 p.m.	1 2
11	,,	S.L.	,,	S.L.	,,	0 4	,,	0 3	1 a.m.	4 6	6 p.m.	1 0
12	,,	below 0 1	,,	S.L.	,,	0 4	12 p.m.	0 6	8 p.m.	1 0	noon	0 7
13	,,	0 1	,,	S.L.	,,	0 3	noon	0 6	1 a.m.	0 11	6 a.m.	1 4
14	,,	0 1	7 a.m.	0 4	,,	0 2	1 a.m.	0 5	6 a.m.	0 6	12 p.m.	1 8
15	,,	0 1	10 a.m.	1 3	,,	S.L.	,,	0 2	4 p.m.	0 5	,,	2 9
16	,,	0 1	12 p.m.	0 5	,,	S.L.	noon	S.L.	noon	0 4	,,	6 0
17	,,	0 2	4 p.m.	0 5	,,	S.L.	12 p m.	1 9	,,	0 4	6 a.m.	6 6
18	6 p.m.	0 5	8 p.m.	1 3	,,	S.L.	8 a m.	2 5	10 p m.	S.L.	1 p.m.	3 6
19	1 a.m.	0 5	5 a.m.	1 3	,,	S.L.	1 a.m.	1 6	9 a.m.	S.L.	1 a.m.	3 7
20	noon	0 3	noon	0 2	,,	S.L.	,,	0 9	8 a.m.	0 8	,,	1 3
21	,,	0 3	1 a.m.	0 7	,,	S.L.	,,	0 5	noon	0 1	,,	1 0
22	,,	0 2	noon	0 4	,,	S.L.	noon	S.L.	,,	0 3	,,	0 6
23	11 a.m.	0 5	5 p.m.	1 11	,,	S.L.	,,	S.L.	,,	0 2	10 p.m.	0 6
24	1 a.m.	0 1	noon	1 6	,,	S.L.	12 p.m.	0 2	,,	0 2	1 a.m.	0 4
25	9 p.m.	above 0 9	1 a.m.	0 10	,,	S.L.	noon	0 2	,,	0 4	noon	0 3
26	1 a.m.	0 9	,,	0 6	,,	S.L.	,,	0 2	,,	0 3	,,	0 2
27	noon	S.L.	noon	0 4	,,	S.L.	,,	0 1	3 p.m.	0 1	,,	0 2
28	,,	S.L.	,,	0 3	,,	S.L.	,,	S.L.	noon	0 2	,,	0 3
29	7 p.m.	0 2	1 a.m.	0 2	,,	S.L.	,,	S.L.	12 p.m.	0 6	,,	0 3
30	noon	S.L.	noon	S.L.	,,	S.L.	,,	S.L.	,,	1 6	12 p.m.	1 4
31	..	S.L.	..	S.L.			,,	S.L.			8 a.m.	1 10

OUSE FLOODS FROM RETURNS TO THE CITY SURVEYOR.

COMPARATIVE TABLE, 1904.

Date.	Nidd at Pateley Bridge.		Ure at Middleham Bridge.		Swale at Richmond.	
	Hour.	Height	Hour.	Height	Hour.	Height
		ft. in.		ft. in.		ft. in.
Jan. 8			8 a.m.	4 0		
Feb. 13			4 p.m.	7 0		
,, 20			8 a.m.	7 0		
Mar. 21			11 a.m.	5 0		
,, 29			7 a.m.	6 0		
April 3			10 a.m.	7 0		
,, 5			2 p.m.	6 0		
,, 6			10 a.m.	10 0		
,, 29			11 p.m.	4 0		
May 2			9 a.m.	5 0		
June 1			6 a.m.	5 0		
Aug. 14			4 p.m.	4 6		
,, 18			11 a.m.	4 0		
,, 23			7 a.m.	3 0	9 a.m.	2 0
Oct. 17			11 a.m.	5 0	3 p.m.	2 0
Nov. 9			3 p.m.	11 0	12 a.m.	3 0
,, 30			4 p.m.	4 0		
Dec. 5			11 a.m.	3 2		
,, 15			4 p.m.	3 6	12 a.m.	4 0
,, 30			11 a m.	4 0		

YORK—THE MUSEUM.

Barometer at 32° and M.S.L.

1904.	Highest Barometer.	Lowest Barometer.
January	30·723 22nd, 9 a.m.	28·765 14th, 9 a.m.
February	30·379 28th, 9 a.m.	28·662 9th, 9 p.m.
March	30·480 24th, 9 a.m.	29·195 29th, 9 p.m.
April	30·320 18th, 9 p.m.	29·293 13th, 9 a.m.
May	30·266 20th, 9 a.m.	29·471 7th, 9 a.m.
June	30·369 5th, 9 a.m. / 22nd, 9 a.m.	29·419 25th, 9 a.m.
July	30·362 18th, 9 a.m.	29·736 26th, 9 a.m.
August	30·202 3rd, 9 a.m.	29·469 15th, 9 a.m.
September	30·367 18th, 9 a.m.	29·739 30th, 9 p.m.
October	30·551 13th, 9 a.m.	29·246 5th, 9 p.m.
November	30·583 14th, 9 p.m.	29·278 9th, 9 a.m.
December	30·626 19th, 9 a.m.	28·886 12th, 9 a.m.
Year	30·723 Jan. 22nd, 9 a.m.	28·662 Feb. 9th, 9 p.m.

YORK (BOOTHAM)—SUNSHINE VALUES.

Month.	Total Hours.	Percentages.	
	1904.	1904.	1903.
January	27·8	11	13
February	35·4	13	14
March	60·9	17	25
April	137·0	33	33
May	123·3	25	28
June	178·7	35	35
July	178·6	35	28
August	180·2	40	33
September	152·4	41	36
October	90·4	28	19
November	44·3	18	22
December	32·9	15	5
Year	1241·9	28	26

THE TREASURER'S ACCOUNT IN CONNECTION WITH THE FUND FOUNDED BY THE LATE WM. REED, ESQ., FOR SPECIFIC PURPOSES.

Dr. INCOME.

	£	s.	d.
Interest on £600 York Corporation 3 % Redeemable Stock, less Income Tax	17	2	9
Interest on £50 placed on deposit at York City and County Bank	1	5	0
	£18	7	9

EXPENDITURE **Cr.**

	£	s.	d.
Books and Binding	18	7	9
	£18	7	9

BALANCE SHEET.

	£	s.	d.
Amount of Fund on 31st December, 1904	687	19	2
	£687	19	2

	£	s.	d.
Amount invested in York Corporation 3 per cent. Redeemable Stock	600	0	0
Amount placed on Deposit at York City and County Bank	50	0	0
Cash at Bankers in General Account	37	19	2
	£687	19	2

13th February, 1905.

Examined and found correct,
PHILIP L. NEWMAN.

FRANK GUY,
Assistant Treasurer.

THE TREASURER IN ACCOUNT WITH THE YORKSHIRE

Previous Year.	**Dr.** INCOME.	£ s. d.	£ s. d.
	Subscriptions:		
	Town Members	676 0 0	
	Country Members	11 0 0	
	Temporary Members...	0 0 0	
	Lady Subscribers	59 10 0	
	Associates	14 0 0	
	Arrears received	21 5 0	
854	Keys of Gates...	69 16 0	
			851 11 0
	Rents:		
	Major Allenby, St. Mary's Lodge	65 0 0	
	Mr. Hill, Marygate Baths	40 0 0	
	York Amateur Rowing Club	5 0 0	
	York and District Field Naturalists' Society, less £2 paid to Attendant	1 0 0	
	York Waterworks Co., for Shed	5 0 0	
	Do. for Light	0 1 0	
	Corporation of York—Lease of Exhibition Land ...	2 0 0	
	Yorkshire School for the Blind for Light	0 1 0	
	National Telephone Co.	1 0 0	
122	York Archæological Society, less £2 paid to Attendant	1 0 0	
			120 2 0
	Whitsuntide Admission Fees	11 7 6	
	Less: Attendants and Police 5 0 0		
3	Joiner for Barricades... ... ... 0 12 0		
		5 12 0	
			5 15 6
5	Sale of Catalogues		5 18 8
2	Sale of Photographs		4 5 4
7	Bank Interest		6 11 6
209	Gate Money		208 9 11
26	Interest on £918 8s. 9d. India 3% Stock, less Income Tax		26 4 10
			1228 18 9
	Excess of Expenditure over Income...		13 15 0
			£1242 13 9
321	Balance in hands of the Treasurer, 31st December, 1904		307 16 11
			£307 16 11

Examined and found correct,

PHILIP L. NEWMAN.

13th Feb., 1905.

FRANK GUY,

Assistant Treasurer.

PHILOSOPHICAL SOCIETY FOR YEAR ENDING 31ST DEC., 1904.

Previous Year.	EXPENDITURE.	£ s. d.	£ s. d.	Cr. £ s. d.
1	Crown Rent			1 0 0
19	Corporation Rent			19 3 11
	Rates and Taxes:			
	Property Tax and City Rates		42 4 11	
	Waterworks Company's Rates		10 12 10	
	Gardeners' Licenses		2 5 0	
55	Receipt and Cheque Books Stamping ...		1 16 11	
			———	56 19 8
	Insurance:			
7	Fire Premium...		7 5 0	
	Workmen's Compensation Premium		1 0 9	
			———	8 5 9
	Salaries and Wages:			
	Mr. Platnauer		150 0 0	
	Mr. Fielden		60 0 0	
	Miss Baines		42 8 0	
	Mr. Guy		30 0 0	
	Attendants at Museum and Hospitium, viz.:			
	Attendant at Museum	79 6 0		
	Female Attendant at Museum...	31 16 0		
136	Female Attendant at Hospitium	33 2 6		
		———	144 4 6	
129	Gardeners, including temporary hands and extra duty at gates		160 0 0	
			———	586 12 6
	(*Memo.*—Some Painting done about the Society's Estate is included under this item.)			
197	*Yorkshire Insurance Company, Annuity ...			198 1 2
	General Repairs, Additions, and Expenses:			
13	Museum and Hospitium—General Additions, Repairs, and Expenses		24 14 10	
	Estate:			
63	Ordinary general repairs	25 10 4		
	Repairs to St. Mary's Abbey	28 4 4		
		———	53 14 8	
	Gardens:			
21	General Additions, Repairs, and Expenses ...		15 10 8	
			———	94 0 2
9	Outdoor entertainments			3 10 7
23	Library—Books and Binding			7 8 4
63	Lectures			46 2 1
6	Printing and Stationery			14 19 9
11	Printing Communications to Members, and Postage of same			12 3 8
36	Printing Reports and Postage thereof			55 1 10
3	Teas at Monthly Meetings...			3 8 2
	Gas, Coal, and Coke:			
	Museums		26 11 0	
	Gardens		15 13 0	
64	Estate		20 8 9	
			———	62 12 9
24	Ornithological Department			23 19 0
20	Antiquarian Department			15 15 7
16	Meteorological Department			15 18 0
1	Preparation of Photographs for sale			1 12 10
8	Sundry Postages			7 16 8
1	Sundries, including Carriage of Parcels ...			1 14 1
	Tent:			
	Repairs and expenses of carriage, fixing, etc.		13 17 3	
	Less: Receipts for letting out on hire		7 10 0	
			———	6 7 3
			£1242	13 9
	Balance in hands of the Treasurer, 31st December, 1903			321 11 11
	Excess of Expenditure over Income, 1904			13 15 0
			£307	16 11

*Annuity of £201 8s. 0d. payable until October, 1914, inclusive, created to repay an advance of £3500 made by the Yorkshire Insurance Co.

Principal repaid	1853	12 2
„ outstanding	1646	7 10
	£3500	0 0

NEW MEMBERS ELECTED, 1904.

Beckwith, Thos., 30, *Colliergate.*
Bellerby, Mrs., *Burnholme.*
Bland, Geo., 6, *Market Street.*
Botwood, Chas. W., D.Sc., *Micklegate.*
Carter, Harry, *The Shambles.*
Cobb, Cecil H., "*Hawkwell,*" *St. Peter's Grove.*
Crichton, D. S., *The Cottage, St. Mary's.*
Dale, R. P., 3, *St. James' Terrace.*
Evans, Hy. A., *Southlands.*
Fryer, Fred G., 32, *Grosvenor Terrace.*
Gill, Jas. P., *Marygate.*
Greenwood, H. C., *The Gables, Sycamore Place.*
Hitchcock, C. K., *Bootham Park.*
Howell, A. T., 91, *Goodramgate*
Hudson, Wm., 12, *Queen Anne's Road.*
Jesper, Mrs., 24, *St. Mary's.*
Jubb, W. C., 8 *and* 9, *Micklegate.*
Leetham, R. E., 72, *Bootham.*
Lloyd, G. W., *Stockton Hall.*
Lupton, John A., 15, *Bootham.*
Murfin, Mrs., *Coney Street.*
Nelson, Mrs., 9, *Grosvenor Terrace.*
Rose, Mrs., 31, *St. Mary's.*
Rose, Fred W., 6, *Gillygate.*
Shannon, John S., *Castlegate.*
Simpkin, Allen, 32, *St, Mary's.*
Steigmann, G., 28, *Goodramgate*
Tate, Edwin R., *Avoncliffe, Clifton Dale.*
Thomlinson, J. J., *Bradford Old Bank.*
Walker, Capt. Edwyn, *Middlethorpe Lodge.*
Walton, Ernest R., 20, *Pavement.*

NEW LADY SUBSCRIBERS.

Graham, Miss, *Bootham.*
Kidd, Mrs., 56, *St. Olave's Road.*
Smith, Miss A. E., 37, *St. Mary's.*
Yarker, Mrs., 26, *High Petergate.*

NEW ASSOCIATE.

Schwabe, Alfred L., 56, *Market Street.*

DONATIONS TO MUSEUM AND LIBRARY.

LIBRARY.

Books Presented.	Donor.
The United States Geological Survey, Monograph xlv. and Atlas, on the Vermilion Iron-bearing District of Minnesota, by J. Morgan Clements; Chemical Analyses of Igneous Rocks, by Henry S. Washington; Chemical Composition of Igneous Rocks, by J. Paxon Iddings; Drainage Modifications in S.E. Ohio and District, by W. G. Tight; Reconnaissance from Fort Hamlin to Kotzebue Sound, Alaska, by W. C. Mendenhall; Forest Conditions in the Cascade Range Forest Reserve, Oregon; The Mineral Resources of the Mount Wrangell District, Alaska; California Hydrography, by J. B. Lippincott; Report of Progress of Stream Measurements, by F. W. Newell; Irrigation in India, by H. N. Wilson; Storage Reservoirs on Stony Creek, California, by Burt Cole; The relation of rainfall to run off, by P. W. Rafter: Mineral Analyses from the Laboratories of the United States Geological Survey, by F. W. Clarke; The Carboniferous formations of Colorado, by G. H. Girty; and Bulletin No. 193. Contributions to Economic Geology, 1893: Analyses of Rocks, 1880 to 1893.	The Survey.

The Quarterly Journal of the Geological Society of London, Vol. lx., 1904.	The Society.
Proceedings of the *Zoological* Society of London, Vol. i., Parts 1 and 2; Vol. ii., Parts 1 and 2. Transactions, Vol. xvii., Part 3.	The Society.
Annual Report of the Smithsonian Institution, Parts 1 and 2 for 1892, and 20th Annual Report of the Bureau of American Ethnology, 1888-9.	The Institution.
Catalogue of Mesozoic Plants, The Jurassic flora, Part 2, Second Report on Economic *Zoology*, and an Introduction to the Study of Meteorites.	The Trustees of the British Museum.
Memoirs of the Geological Survey of India "Palæontologia Indica,', Series xv., Vol. i. Part 5 and Vol. iv., and Memoirs, Vol. xxxii., Part 4; Vol. xxxv., Part 3, Vol. xxxvi., Part 1. Records, Vol. xxxi., Parts 1, 2, 3.	The Indian Survey.
An Account of the Crustacea of Norway, Vol. v., Parts 1, 2, 3, by G. O. Sars.	The Author.
Memoirs of the Russian Geological Society, Vol. xiii., No. 4; Vol. xv., No. 1; Vol. xix., No. 2, Parts 5, 6, 7, 8, 9, 12. Bulletin, Vol. xxii., Nos. 1-10. Proceedings, Vol. xxi., No. 2.	The Society.
Proceedings of the Russian Mineralogical Society, 1904.	The Society.
Proceedings of the *Zoological* Society of Russia, Vol. xviii., 1894.	The Society.
Memoirs of the Geological Survey of the United Kingdom, Vol. iii. The Upper Chalk of England; The Geology of the Oolitic and Cretaceous Rocks, south of Scarborough, by C. Fox Strangways.	H.M. Government.

Memoirs and Proceedings of the Manchester Literary and Philosophical Society, Vol. xlviii., Nos. 2, 3.	The Society.
Transactions of the Leicester Literary and Philosophical Society, Vol. vii., Part 2, and Vol. viii.	The Society.
Bulletin of the American Geographical Society, Vol. xxxv., No. 5, Vol. xxxvi., Nos. 1-12.	The Society.
The Transactions of the Northumberland, Durham and Newcastle-upon-Tyne Natural History, Vol. i., Pt. 1.	The Society.
Proceedings of the Geologists' Association, Vol. xviii., Parts 5 and 6,	The Association.
The Journal of the Manchester Geographical Society, Vol. xix., Nos. 4-12, Vol. xx., Nos. 1-3.	The Society.
Transactions and Proceedings of the Perthshire Society of Natural Science, Vol. iv., Part 1.	The Society.
Murray's Handbook of Yorkshire, 4th Edition, 1904.	Edward Stanford.
15th Annual Report of the Missouri Botanical Garden, 1904.	The Council.
9th Annual Report of the Australian Association for the Advancement of Science, Hobart, 1902.	The Association.
Buträge zur Biogeographie und Morphologie der Alpen, by Christian März.	The Author.
Verhandlungen der Naturforschenden Gesellschaft in Basel, Vol. xv., Nos. 2, 3.	The Society.
Report and Proceedings of the Belfast Natural History and Philosophical Society, 1902-3, and Guide to Belfast and adjacent Counties.	The Society.

Annals of the New York Academy of Sciences, Vol. xiv., Parts 3, 4.	The Academy.
Transactions of the Academy of Science of St. Louis, Vol. xii., No. 9 and 10; Vol. xiii., Nos. 1-9; Vol. xiv., Nos. 1-6.	The Academy.
Travaux Scientifiques de L'Universite de Rennes, Vol. i., Parts 1, 2, 3; Vol. ii.	The University.
Transactions of the Wisconsin Academy of Sciences, Arts and Letters, Vol. xiii., Part 2; Vol. xiv., Part 1.	The Academy.
Boletin del Cuerpo de Ingenieros de Mines del Peru, Nos. 4 and 6-15.	The Society.
2nd Report of the Geological Survey of Natal and Zululand.	The Survey.
Memoirs of the Royal Natural History Museum of Belgium, Fossil Insects.	The Museum.
Records of the Geological Survey of New South Wales, Vol. vii., Part 3.	The Survey.
Annual Report of the Department of Mines of New South Wales for 1903.	The Department.
Reports of the Meteorological Council to the Royal Society for 1903 and 4. Report of the International Meteorological Committee 1903, and Weekly Weather Reports for 1904.	The Meteorological Council.
Annalen des K. K. Naturforschenden Hofmuseums für 1903.	The Society.
Mitteilungen des Vereins für Erdkunde Leipsig für 1903.	The Society.
Bergen Museums Aarbog for 1903-4.	The Society.
Annals of the National Museum of Montevideo.	
Proceedings of the Institute of Geology of Mexico, Vol. i., Nos. 2, 3.	The Institute.

University of Toronto Studies, Nos. 3, 4, 5. Physical Science, Nos. 40-43. Chemical Laboratories.	The University.
Science Bulletin of the University of Kansas, Vol. ii., Nos. 1-15.	The University.
Journal of the Northants Natural History Society and Field Club, Vol. xxii., Nos. 93-96.	The Society.
Bulletin of the University of Montana, Nos. 18-20.	The University.
Tuft's College Studies, No. 8.	The College.
Proceedings of the Croydon Natural History and Scientific Society, 1903-4	The Society.
Proceedings of the Bristol Naturalists' Society, New Series, Vol. x., No. 3.	The Society.
Norwegian Researches, by Dr. Paul Winge.	The Author.
The Formation of a Species, by J. F. Walker, M.A.	The Author.
A Plan of Old York.	W. T. Walker.
83rd Annual Report of the Leeds Literary and Philosophical Society.	The Society.
29th Annual Report of the Victoria University (The Yorkshire College).	The University.
Annual Report of the Director Field Columbian Museum.	The Director.
Hull Museum Publications for 1904, by Thos. Sheppard.	The Author.
Annual Report of the Medical Officer of Health for York.	Dr. Smith.
51st Annual Report and Transactions of the Nottingham Naturalists's Society, 1902-3.	The Society.
Report of the National Astronomical Observatory of Mexico, 1904.	The Society.

Books Presented by Mrs. Haworth, 1904.

Curiosities of Olden Times, by S. Baring-Gould, 1896.
Yorkshire Oddities, Vols. i. and ii., by S. Baring-Gould, 1875.
Records of York Castle, by Twyford and Griffiths, 1880.
Appendix to Records of York Castle, by Cap. Twyford, 1883.
Old Clocks and Watches and their Makers, by F. J. Britten, 1899.
Antiquities of Greece, by John Potter, D.D., Vols. i. & ii., 1818.
A Book about Bells, by the Rev. Geo. S. Tyack, 1898.
Archæologia, Vols. xliii.; lv., Part 2; lvi., Parts 1 and 2; lvii., Parts 1 and 2; lviii., Parts 1 and 2.
The Arts in the Middle Ages, by Paul Lacroix.
The Topography, Edifices and Ornaments of Pompeii, by Sir William Gell and John P. Gandy, in 2 Vols., 1824.
History and Topography of York and North Riding of Yorkshire, by J. J. Sheahan, in 3 Vols., 1871.
Monumental Brasses and Slabs of the Middle Ages, by the Rev. Charles Boutell, 1847.
The Worthies of Yorkshire and Lancashire, by Hartley Coleridge, 1836.
Gothic Ornaments in York Minster, by Joseph Halfpenny, 1795.
Walton's Lives, with Notes by Thomas Zouch, York, 1796.
Willis's York Cathedral.
Thesaurus, by John Ecton, 1763.
The History and Antiquities of the Fortifications to the City of York, by H. F. Lockwood and A. H. Gates, 1834.
The Report of the Commissioners of Charities relating to York City and East Riding of Yorkshire.
Diocesan Histories—York, by George Ornsby; Durham, by J. L. Low.
The Venerable Bede's Ecclesiastical History of England; also The Anglo-Saxon Chronicle, by J. A. Giles, 1849.
Symbolism in Christian Art, by Edward Hume, 1892.
A Dictionary of Old English Plays, by James O. Halliwell, 1860.
Gœdartius De Insectis, by M. Lister, 1685.
Eccentric Biography of Female Characters, 1803.

Yorkshire Wit, Character, Folklore and Customs, by R. Blakeborough.

Manners, Customs and Dress during the Middle Ages, by Paul Lacroix, 1874.

Anecdotes of some Distinguished Persons, chiefly of the present and two preceding Centuries, in 3 Vols., 1795.

Anecdotes, Religious, Moral, and Entertaining, by Charles Buck, in 2 Vols., 1807.

Relics for the Curious, in 2 Vols., 1824.

Elements of Campanalogia, or an Essay on the Art of Ringing, by Henry Hubbard, 1868.

Eccentric Biography, or Memoirs of Remarkable Characters, Maze, 1803.

Burnet's Travels, by Gilbert Burnet, D.D., 1737.

The Blessed Jew of Morocco, by Thos. Calvert Broad, York, 1648.

A Complete History of the Rebellion, 1745-1746, by James Ray. Printed by Jackson, York, 1749.

A Collection of Psalms and Hymns, from various Authors. Printed by Wilson, York, 1813.

Memoirs of George Whitehead, by Samuel Tuke, 2 Vols. Printed by Alexander and Son, York, 1830.

The Elector's Guide, No. 1. Published by G. Bolland, York, 1826.

Reflections on Death, by William Dodd, LL.D. Published by J. Kendrew, York, 1818.

The Life of Dr. Thomas Morton. Printed by Stephen Bulkley, York, 1669.

Practical Measuring by a new Set of Tables, by E. Hoppus. Printed by Thos. Wilson and Son, York, 1819.

Insects, by Dr. Lister. Printed by John White, York, 1682.

Anthems for the Eight Voices in the Cathedral Church of York, by Thomas Ellway. Printed in York for John Hildyard, 1753. 2nd Edition.

A List of the Lord Mayors and Sheriffs of York. Printed by Stephen Bulkley, York, 1664.

Anthems for the Eight Voices in the Cathedral Church of York, by Thomas Ellway. Printed by Gent, York, 1736. 1st Edition.

The Antiquities of York and the Civil Government thereof, by James Torr. Printed by White, York, 1719.

Miscellanea Curiosa. Gent, 1734.

The Ancient and Modern History of York, by Thos. Gent. Printed by the Author, 1730, York.

The Ancient and Modern History of the Town of Ripon, by Thos. Gent. Printed by the Author, York, 1733.

History of Kingston-upon-Hull, by Thos. Gent. Printed by the Author, York, 1735.

History of the Great East Window in York Cathedral, by Thos. Gent, York, 1762.

Eutropius's History of Rome, by John Clark. Printed by Gent, York, 1728.

History of Rome, by L. Florus. Printed by Gent, York, 1730.

History of Queen Elizabeth and the unfortunate Earl of Essex, by T. Gent, 1712.

History of the Monarchs of Great Britain, by Thos. Gent, 1740.

Penitential Desires, Sighs and Groans of the Wounded Soul, by Thos. Gent, 1724.

Natural History of Ferns, British and Exotic, by E. J. Lowe.

Proceedings of the Suffolk Institute of Archæology and Natural History, 13 parts.

Proceedings of the Society of Antiquaries of London, 7 parts.

The Publications of the Surtees Society, Nos. 86, 88, 89, 90, 92 to 108 inclusive.

The Associated Architectural Societies' Reports and Papers, Vols. 4 to 25 inclusive.

The Dictionary of Architecture. Parts 18, 19, 20, 21.

The Yorkshire Archæological Journal. Parts 50, 55, 57.

The Publications of the Yorkshire Parish Register Society, St. Michael-le-Belfrey.

The Northern Genealogist, 11 Parts.

Transactions of the Oxfordshire Archœological Society, 7 Parts.

Transactions of the Exeter Diocesan Architectural Society. Vol. v., Part 1.

And a number of Pamphlets, Reprints, and Annual Reports of the Yorkshire Philosophical Society.

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THE CHURCH AND PARISH OF S. MARTIN-CUM-GREGORY.

By GEORGE BENSON, A.R.I.B.A.

THE CHURCH AND PARISH OF S. MARTIN-CUM-GREGORY.

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THE portion of York lying on the western bank of the river was a flourishing district in the time of the Roman occupation of Britain, for excavations have revealed extensive Roman baths, temples, villas and graves, showing the area was occupied by a civilian population. It is known from remains that the walled-in military station was on the eastern side of the river.

When Christian missionaries visited Roman York, they naturally came to the civilian suburb and took their stand on the top of the ground rising from the river, and there preached the gospel of Christ. The missionaries made converts and founded a Christian church, and in course of time the district was organised and a Bishop placed over it, with his seat at York, for in 314 it is recorded that the Bishop of York was present at the Church Council at Arles. That there were Christians in York at that period has been proved by the finding within a Roman stone coffin of a Latin inscription signifying "Sister, farewell, live in God."

The cathedral and residence of the Bishop of York was on what is still called the Bishop's Hill. The greater part of the tower of Bishophill Junior is built of Roman masonry. The foundation of S. Martin's tower is also built of Roman masonry (Plate I. Fig. 1) evidently taken from a Roman temple, but unfortunately in the reign of Edward VI. the whole of the Tower above the plinth was taken down.

S. Martin, to whom the church is dedicated, served in the Roman army which he left when forty years of age to devote himself to the service of God. He became Bishop of Tours and subsequently retired to a cell a short distance from Tours, and hence arose the famous monastery of S. Martin at

Marmoutier. Such was the fame of S. Martin that in his lifetime churches were dedicated to him. He died at the end of the fourth century.

At the latter part of the fifth century York was invaded by the pagan English, the Christians with their bishop were compelled to depart and abandon their church buildings. By the increasing incursions of the Anglo-Saxons the British Church was gradually driven westward until it settled in Wales, Cornwall, and Ireland. In the latter island the British Church made wonderful progress, and sent missionaries to convert the Anglo Saxons. By the end of the sixth century Columba had crossed to Iona and established a monastery.

In 597 missionaries from Rome came to Kent and converted King Ethelbert; twenty-eight years later Edwin, the pagan King of Northumbria, married Ethelberga, daughter of Ethelbert. Queen Ethelberga was a Christian, so brought her chaplain Paulinus with her. In Canterbury they had worshipped in the church of S. Martin, and on coming to York what was more likely than that they should restore the ruined church of S. Martin on the Bishop's Hill, and worship therein. King Edwin was eventually converted, and in 627, on the opposite side of the river, he built a wooden church, which was the beginning of our glorious Minster. For six years Christianity flourished in the district and King Edwin began the erection of a larger and nobler Minster in stone. After Edwin fell in battle York was invaded by the pagan King Penda, and Christianity in this city was once more extinguished, the Queen and Paulinus fled to the coast and sailed for Kent.

Subsequently the pagan king was defeated by the Christian King Oswald, who sent to Iona for missionaries, and they re-introduced Christianity into the district. The church of S. Martin was again restored, and most likely had a wooden nave and altar-house: shortly before the Norman Conquest it was destroyed by fire and rebuilt in stone; in general appearance it resembled the pre-conquest stone church still existing at Kirk Hammerton.

William the Conqueror expelled the English from their estates, kept some for himself and distributed the remainder to his followers on a tenure of fealty, so the church and lands

of S. Martin were given away and in time descended to the Barons Trusbutt, of Hamlake (Helmsley). In 1230 a member of that noble house became rector, and to the nave he added aisles, which were half the width of the present ones. The walls on either side of the nave were *pierced* by two chamfered pointed arches of two orders, resting on central columns 21 inches in diameter, having moulded caps enriched with nail-head or pyramid ornament, the forerunner of the dog-tooth. The bases have a circular mould resting on a square block of sandstone. To east and west the arches rest on moulded responds. The doorway had a pointed arch surrounded by nail-head ornament. The aisles would be lighted by narrow windows with pointed heads, and the nave roof continued over the aisles as in the beautiful 13th century church at Skelton, four miles away. It appears from the Archbishop's Register that in June 1307, two boys were fighting in the churchyard of S. Martin's, Micklegate, and in the scuffle one of them received a blow on his nose, causing some drops of blood to fall on the ground. This pollution required expiation, and accordingly a license was granted by Archbishop Greenfield on June 5th, to the official at York, to sprinkle with holy water the churchyard of S. Martin in Micklegate.

From 1306 to 1372, Torre, the antiquary, records the Prior and Convent of Wartre as exercising the patronage. During the fourteenth century the church was enlarged by increasing the width and length of the north aisle. The *Early English* doorway was preserved and rebuilt, forming the new entrance. The increase in the width of the aisle caused the lean-to roof to give place to a gabled one. The *Decorated* aisle was without buttresses, and the change from the small lancet windows to the large three-light windows, with flowing tracery, gave it a magnificent appearance. Internally the aisle was resplendent with painted glass, some of which remains. At its east end stood the altar of S. John the Baptist and S. Catherine, at which a chantry was founded for the soul of Richard Toller. On the altar stood a figure of the Baptist. The east window over the altar was removed when the church was lengthened in later times, and the window was built in the east end of the south chancel aisle. This window contains

figures of the Blessed Virgin and S. John, on a red diapered ground studded with golden fleurs-de-lis. The central panel has been destroyed, but was probably the Crucifixion. The window north of the altar in the *Decorated* aisle still contains the original glass figures of S. John with emblem the Lamb of God, and S. Catherine holding a Wheel. The western window depicted S. Thomas and our Lord, Christ with the Magdalene, and the Resurrection in the central light. The west window illustrated the life of S. Martin, the patron saint. The principal panel, S. Martin on horseback, and dividing his cloak with a beggar, still exists, having, since the time of *Gent*, been removed to the east window of the south aisle of chancel. Between the two windows on the north side of the *Decorated* aisle, (Pl. I. Fig. 2) and at floor level is a moulded arched recess, which has contained a recumbent figure (Pl. II. Fig. 1) now placed upright on Hob Moor. It represents a warrior with shield bearing the arms of the family of Ros, who dwelt at Ros Hall, now Water Fulford Hall.

An extract from a will made by a woolman in 1390, gives an insight of the church at this period. He commends his soul to Almighty God, the Blessed Virgin Mary, and all the Saints, and directs his body to be interred in the church of S. Martin, in Micklegate, bequeathing 6s. 8d. for the burial fee, 13s 4d. was to be expended in wax candles to burn about his coffin, and 20s. to pay other burial expenses. He also left a sum of money to provide a wax candle to burn for a year before the image of The Baptist in the church of S. Martin. At the funeral thirteen chaplains were to celebrate for his soul. The number thirteen is a common one in connection with mediæval burials, which may have caused it to be regarded as an unlucky number.

One of the most prosperous of our city merchants was John de Gisburne, a mercer, who lived in the parish. He was M.P. for York and Mayor on three occasions. One of his daughters married Sir Wm. Plumpton, whose mother was sister to Archbishop Scrope. John de Gisburne died in 1390 and was buried in the choir between the high altar and the altar of S. Nicholas, and later a chantry with two chaplains was founded to pray for his soul.

In 1405 Archbishop Scrope rebelled against King Henry IV. Sir Wm. Plumpton would feel quite safe in joining the forces of his uncle the Archbishop, for the Church at that time was very powerful. The insurrection however failed, and both were executed. No king dealt such a blow at the power of the Church as Henry IV. did in beheading the Archbishop. Sir Wm. Plumpton was beheaded on the Whit Monday, and the execution was witnessed by his son George. The unfortunate son-in-law of the York merchant had a daughter Katherine, who in a letter to her brother George describes a visit to one of her aristocratic relations, Mistress Darcy, a daughter of Sir John Scrope: "By my troth I stood there a large hour and yet I might neither see Lord nor Lady and had the strangest cheer that ever I had of my Mistress Darcy, and yet I had five men in a suit. There is no such five men in Sir John's Scrope's house, I dare say." The family chantry in S. Martin's was augmented to include prayers for Sir Wm. Plumpton.

In 1385 William de Tynington was elected Prior of Warter, but he was subsequently expelled by the Archbishop of York. The patronage of S. Martin's church ceases to belong to the Prior and Convent of Wartre, and is exercised by Henry, Lord Scrope of Masham.

Stephen, the second Baron Scrope of Masham, had a residence at Turnham Hall, Cliff, near Hemingborough; he died in 1406 and was buried in the Minster near the remains of his brother, the Archbishop. His son Henry, third Lord Scrope of Masham, although a nephew of the Archbishop whom the king had beheaded, was in high favour with his sovereign Henry IV. In 1407 he was patron of this church, and the first rector he presented was Thomas Cliff, most likely a neighbour of the Scropes when living at Turnham Hall, and member of a family which became famous through Henry Cliffe, Master of the Rolls, who died in 1232.

On Dec. 14th, 1409, William Moreby, a citizen, made his will, desiring to be buried in the churchyard of S. Martin, and bequeathed to a chapel newly to be built in this church several vestments, and gave land for a chaplain to celebrate for his soul and the souls of others.

During the fifteenth century, the church was greatly enlarged, (see Plan) its size being nearly doubled. The additions were made to the east end of the church, and did not interfere with the then edifice until nearly complete. The north chapel with crypt was the first of the additions, then the chancel was extended with its south aisle, to the east end of which the east window of the *Decorated* aisle was removed. The old chancel was taken down, and the new work connected to the old. Subsequently the *Early English* south aisle of nave was widened to correspond with the south aisle of chancel. The windows are of a different design, and on the exterior the masonry of the new work butts against the earlier work and is not bonded with it. (Pl. II. Fig. 2.) Two of the buttresses have trefoiled-headed panels containing shields, one with the arms of Vavasour, still traceable, and the other worn away, but said by Gent to have borne the arms of Gascoigne; so this later work was built about 1460. Sir Henry Vavasour, knt., of Haslewood, succeeded his father in 1452, and married Joan, daughter of Sir William Gascoigne, of Gawthorpe, and widow of Richard Goldsborough, of Goldsborough. The family of Vavasour gave magnesian limestone for the erection of the Minster, and Sir Henry Vavasour may have been a similar benefactor to the church of S. Martin. On the east side of doorway in the interior of this aisle is a stoup for holy water, with an octagonal basin sloping to a corbel, having a carved head. (Pl. III. Fig. 1.) The church consisted of three gabled roofs stretching from east to west, which made the interior dark. In order to admit more daylight, a clerestory was added to the nave, with tall arches to the tower (Pl. III. Fig. 2) and chancel. The ashlar masonry of the clerestory is carried over the nave arches by relieving arches. The nave roof is of very low pitch, approaching to flatness, and covered by lead; the underside is panelled, having carved bosses with shields at intersections.

The thirteen Perpendicular windows (Pl. IV. Fig. 1) were filled with painted glass, the six lights in the tracery of each having figures of saints and bishops, whilst the three long lights below were occupied with scriptural subjects: of these magnificent windows some fragments of the stained glass remain.

In the north aisle of chancel, the westernmost window has in the tracery figures of Archbishops Egbert and Albert, S. Nicholas and others. In the second window is depicted the creation of Adam and Eve who are led into Paradise, in the next window they are eating the forbidden fruit and the death of Abel was also represented. The fourth window illustrated Our Lord walking on the sea and Peter in the ship, the Sacrifice of Abraham, and the Worship of the Golden Calf. The east window was in memory of John de Moreton, Lord Mayor in 1418, the glass represented S. John in the cauldron, also bishops, and the five sons and seven daughters of John de Moreton. In his will made in 1434, he desires to be buried in S. Martin's, Micklegate, in S. Nicholas' quire, against his wife Margaret, who was a daughter of Alderman Barden. A sister of Margaret married Sir John Dawnay, of Escrick, from whom Lord Downe is descended. In the window are inserted two panels and the upper part of a canopy brought from one of the *Decorated* windows of the north aisle of nave, the borders are identical, a panel contains a tall figure of The Baptist, and another a kneeling figure of a lady.

Amongst the painted glass in the south aisle are figures of S. Agnes, S. Lucy, and one with the badge of S. Anthony. The brethren of S. Anthony had a Hall in Peaseholme Green; it was the custom with the citizens to set a little pig apart from a litter and feed it for the brethren. The pigs were so well fed that "as fat as an Anthony pig" became a proverb. The Hall is now used for the Blue Coat School. A small panel in yellow stain depicts the Betrayal of Christ and the Combat between David and Goliath. In the nave aisle the figure of S. George, the patron saint of England, has been restored. In later insertions there were some interesting quarries, amongst them occurs the white boar, the badge of Richard III.

The Parish Registers commence in 1539, and with the exception of S. Olave's Registers (and this only from the fact that the first page is wanting) are the oldest Parish Registers in York. The first two volumes (1539—1734) have been copied by the Rector, the Rev. E. Bulmer, and published. In 1539 there were 5 baptisms, 6 marriages, and 5 burials.

The chantries, chapels, etc, were dissolved in 1547. S. Martin's church was rich in the possession of beautiful *Perpendicular* woodwork in its numerous screens, stalls with misereres, its rood loft, etc., but of these nothing remains. Last year the doorways to the rood loft were discovered and have been left open. (Pl. IV. Fig. 2.)

The reformers under Ed. VI. issued orders for the services of the church to be given in the English tongue and not the Latin. The offices of the church were simplified and a Common Prayer Book in English was issued in 1549, followed by a revised version of it in 1552. During the reign of Edward VI. many of the churches in York were demolished, and S. Martin's narrowly escaped. The work of spoliation was in progress when Ald. Beane came forward on behalf of the parish and succeeded in retaining the church.

The Registers give a vivid idea of the terrible mortality caused by the plague in 1550 and the following year. In 1549 there were 8 burials, in 1550 these had increased to 67, and in 1551 there were 52 burials, and the Registers significantly add "and not one marriage."

John Beane died in 1581. He served the office Lord Mayor in 1545 and 1565 and Member of Parliament in 1554. His only child, Mary, was married in S. Martin's church, to Anthony Wharton, Esq. From this marriage the wealthy and eccentric Mrs. Margaret Wharton, who died in 1791, and her noble contemporary Hugh, Duke of Northumberland, both derived their descent.

In 1585 the church of S. Gregory was united to the church of S. Martin, Micklegate.

A parishioner, Thos. Harrison, was twice Lord Mayor, and two of his sons also filled the office. Another parishioner, Thos. Hoyle, was Lord Mayor in 1632, and M.P. in 1640. Lady Hoyle in 1629 was "surprised with an apoplexy at her private devotions," and was buried in S. Martin's church.

Good examples of *Renaissance* woodwork are preserved in the reredos, pulpit with sounding board, font cover, bread board, and poor box.

In 1655 a new porch was built, and in the following year new gates and a turne pike. In 1667 the tower was rebuilt

and finished with a balustrade. Three years later Lady Sarah, widow of Ald. Bawtry, Lord Mayor, 1670, gave the clock and dial. In the good old days the lady mayoress retained her title of "Lady" for life. The proverb ran

> "The Lord Mayor is a Lord for a year and a day,
> But the Lady Mayoress is a Lady for ever and aye."

About the time of the rebellion of 1745 some one with a diamond cut the following on one of the lozenge shaped window panes of the church: "I hope this may be a place for true Protestants to resort to and never to be ruled by Papists. God bless King George ye 2nd and Billy of Cumberland whom God long preserve."

The high pews in the church, with the western gallery, were removed about 1874.

At the corner of the churchyard stood the Butter Stand which projected very much into Micklegate. In 1778 the butter trade was of great importance in York, no less than 80,000 firkins being annually purchased here, so the very old butter stand was taken down and a new one erected. It was for receiving, weighing, and marking of butter which came from the country, and was afterwards bought by merchants for the London market. In Dec. 1828, owing to the trade having fallen off, the butter stand was taken down.

The parish was practically a self-governed community under the rule of the Rector, Churchwardens, and Overseers. The church was the centre of parochial life, in its vestry the business of the church and parish was transacted. The parish elected its own officers (except Rector), made its own bye-laws, provided its own lighting, kept watch and ward with its constables, had its own stocks, kept in the church a row of leather buckets filled with water ready for an outbreak of fire, looked after its own poor and provided its own workhouse in Barker Lane, dispensed charity by giving bread to the poor, gifts of money to poor widows, loans to poor traders, and presents of money to apprentice boys and girls; was interested in a free school for educating poor boys and girls, perambulated its boundaries every Ascension Day, had its public dinners on

the choosing of churchwardens, the visitation of the Archdeacon, and on Perambulation Day: and went to law when its rights were infringed. To meet expenses rates were levied and collected by the parish officials. At each meeting after the election of overseers. "Lights" were nominated for the next election, and these in turn became overseers. On January 1st, 1901, the City of York for rating purposes became one parish, and Parish Overseers ceased to exist, and thus the last link of the old parochial life was merged in the City Council.

The great event in parish life was Perambulation Day, which took place on Ascension Day. The Ramble, as it was sometimes called, was looked forward to with keen delight by young and old. The rector, churchwardens, feoffees, overseers, clerk, sexton, constable, and the other parish officials met the parishioners in the Vestry, whilst the boys and girls gathered outside. Within the vestry ale and bread were dispensed, then the officials gathered the willows and wands for touching or pricking the boundary, some took ladders to assist over obstacles, and others carried refreshments for support on the way.

Proceeding to the "Grapes," now "Crown," which was within and marked the eastern limit of the parish of S. Martin, the ceremony began with tracing the boundary southwards, keeping on the outside of it as far as possible. Through houses and yards and along Fetter Lane the procession wended its way to a boundary plate (now gone) some 40 feet east of S. Martin's Lane, then turning northwards along the garden behind house, 15 Micklegate, in and out and westward by the narrow passage adjoining the churchyard, crossed S. Martin's Lane, then by stableyard at rear of house, 21 Micklegate, and outside of what is now S. Martin's Square to another boundary plate in Trinity Lane, and so on to Micklegate. The procession passed through the side door of Micklegate House to Tanner Row, where there is a boundary plate, turned to the left as far as another boundary plate (now gone) opposite Smithson's Buildings, and then northwards crossed the end of Friar's Gardens on Toft Green to the City Walls.

The area now occupied by the old railway station was, in early days, the King's Tofts, it was the market place, and also

the place for the people to show arms when necessary. Each parish provided so much armour, which was kept in the church. The Chapel Royal of S. Mary Magdalene on the King's Tofts was, in 1228 given to the Dominicans, who incorporated it in their monastery, and which surrendered in 1538. The site was afterwards occupied as gardens and contained the residence of Thos. Backhouse, and opposite Barker Lane stood Lady Hewley's Hospital. In 1841 the site was cleared for the railway station.

Each parish was jealous of its neighbour infringing its boundary, and it was through lands to the Walls or in the country that the boundary could be challenged; so in the earlier days some follower was seized and bumped three times on the boundary line, and as the bumping was not of a gentle nature, the victim naturally, in after years, could easily recall the spot. In later times stones were inserted in the ground. These boundary stones did away with a good deal of friction and fighting between rival parishes, but the "bumping" was never neglected; anyone who had not been at a Perambulation before was initiated by being seized and bumped three times on the top of the stone, so that he would remember the time and place. Along the thoroughfares where stones would have been inconvenient, iron plates bearing 'Saint Martin-cum-Gregory' were affixed to buildings on the line of boundary.

When the procession arrived at the boundary stone on the City Walls bread and beer were handed round, and after refreshments the party resumed their walk by proceeding along the City Walls in a northerly direction to the other boundary stone on the ramparts, turned south, crossed the moat, and passed the steps leading to Lendal ferry. The house adjoining the steps had a boundary plate, which was removed with house and steps when the new road was formed to Lendal bridge. The ramble was continued along the boundary of the gardens, till lately the wall opposite the old Station Hotel, but now merged in the New Offices, and on to the centre of Tanner Row where, turning northwards for some 47 feet, they met another boundary plate which was removed owing to the erection of the North Eastern hotel. Proceeding along the western and southern boundary of the grounds enclosing the

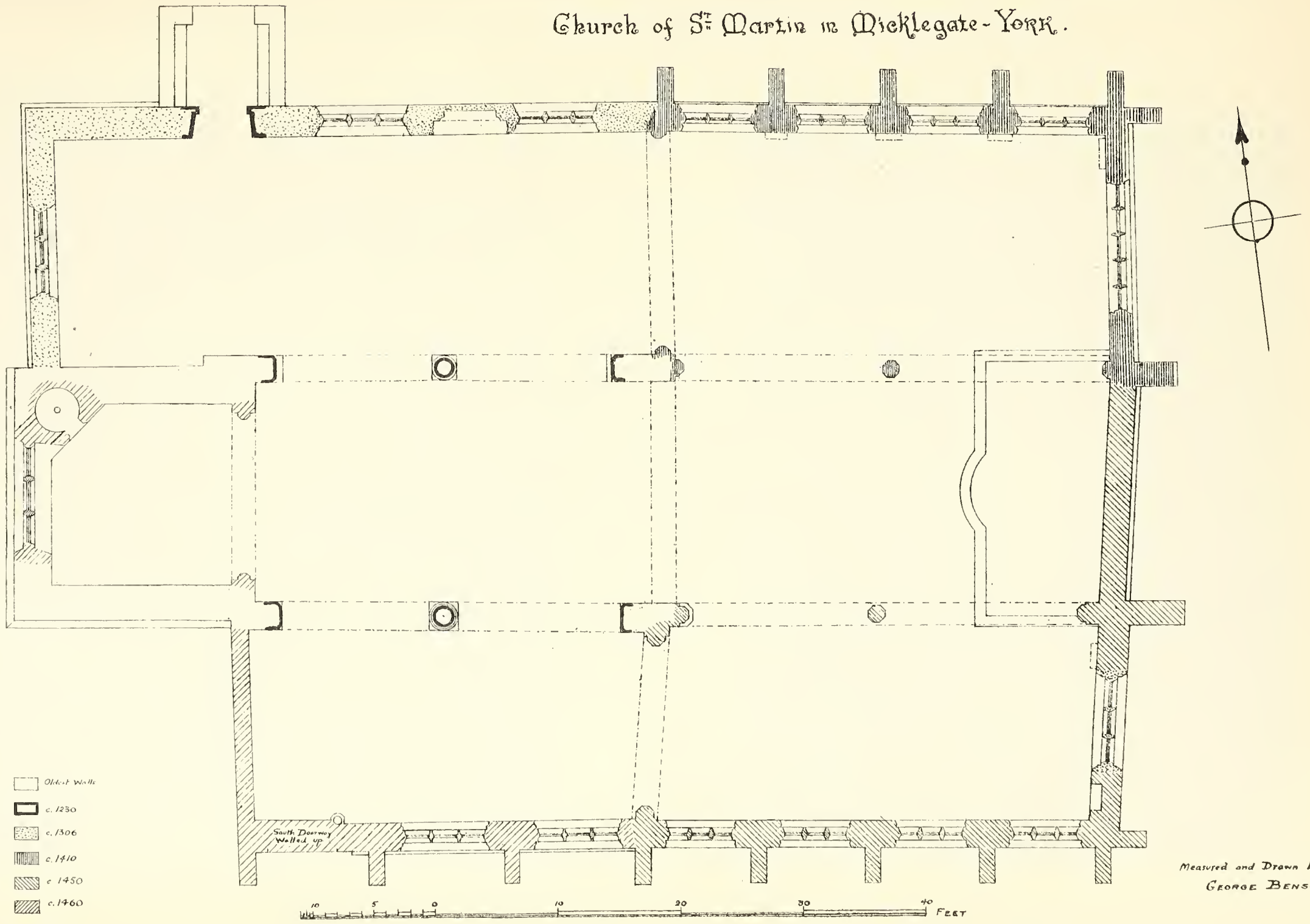
house, which was occupied in 1852 by W. F. Clark but now Messrs. Bushell's warehouse, the party turned south and then east, crossed the ground through which afterwards ran Hudson, now Railway, street, and again south to the "Pack Horse," which terminated the boundary.

The procession returned to the vestry where bread and ale were once more served, and preparation made for perambulating the "detached" portion of the parish known as S. Martin's Hold, at Water Fulford, 3 miles away. For this a cock and jug, which had been previously purchased in the market, were taken. In early times the procession walked to Water Fulford afterwards conveyances were employed, boys followed armed with sticks. Arriving at Water Fulford Hall, occupied by Capt. Key, the party proceeded alongside the river to a boundary stone opposite the residence of the Archbishop, here a newcomer was "initiated" into the ceremony by being seized and bumped three times on the stone, amidst the laughter of the bystanders. The party resumed their walk along the church fields, and were in merry mood for the exciting, but cruel sport of killing the cock. As soon as all the party were on one side of the hedge the cock was thrown over, and the boys quickly followed with sticks and endeavoured to kill the bird, for he who gave the fatal stroke took the dead bird as a reward. The party returned to Water Fulford Hall and entered the porch where there was a boundary stone, over which the jug was broken. On the conclusion of the Perambulation, bread and ale were once more distributed, and soon after the party returned to York for the parish dinner in the evening.

In the parish much civic history is enshrined, it has contributed 25 sheriffs, 28 Lord Mayors, 3 County Sheriffs, and 3 Members of Parliament for the city.

The church is a mausoleum of men famous in civic annals. In its stonework, woodwork, and glass painting, there is much wealth of instruction for the artist, designer, sculptor, mason, joiner, etc., and it is from such treasure houses of applied art that the inspiration of the designer of to-day is drawn. The educational value of an ancient church is very great, but unfortunately it is not generally recognised as such.

Church of St. Martin in Micklegate - York.

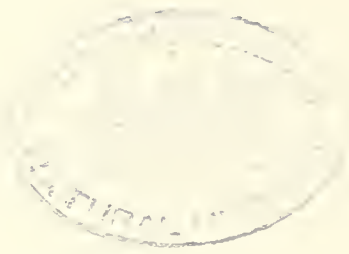


Jan 31st 1905

Measured and Drawn by
George Benson

PHOTO-LITHO. SPRAGUE & Co Ltd LONDON.

PLAN.



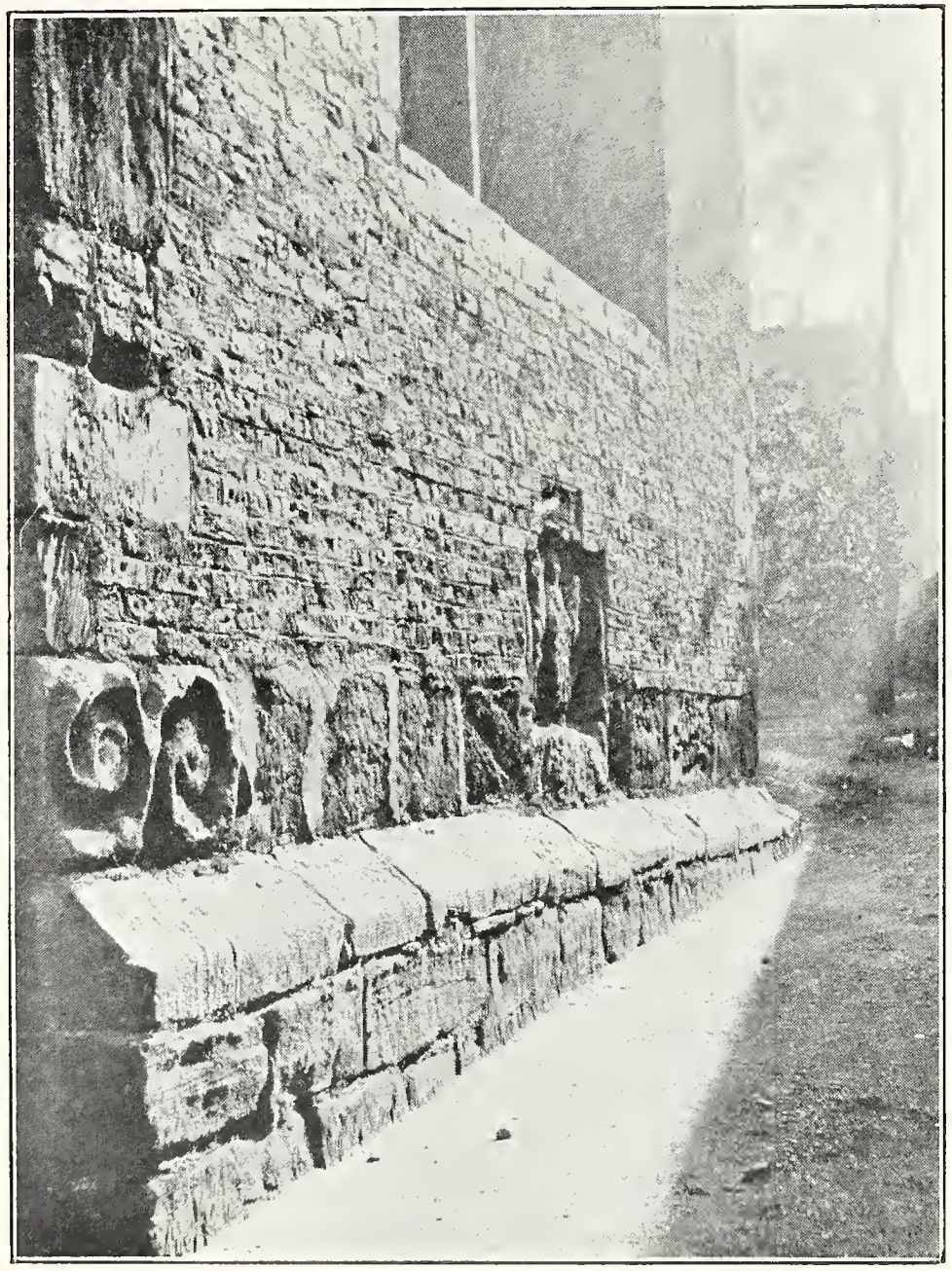


Fig. 1.

Fig. 2.

LIBRARY OF THE
AMERICAN MUSEUM OF
NATURAL HISTORY

Fig. 1.

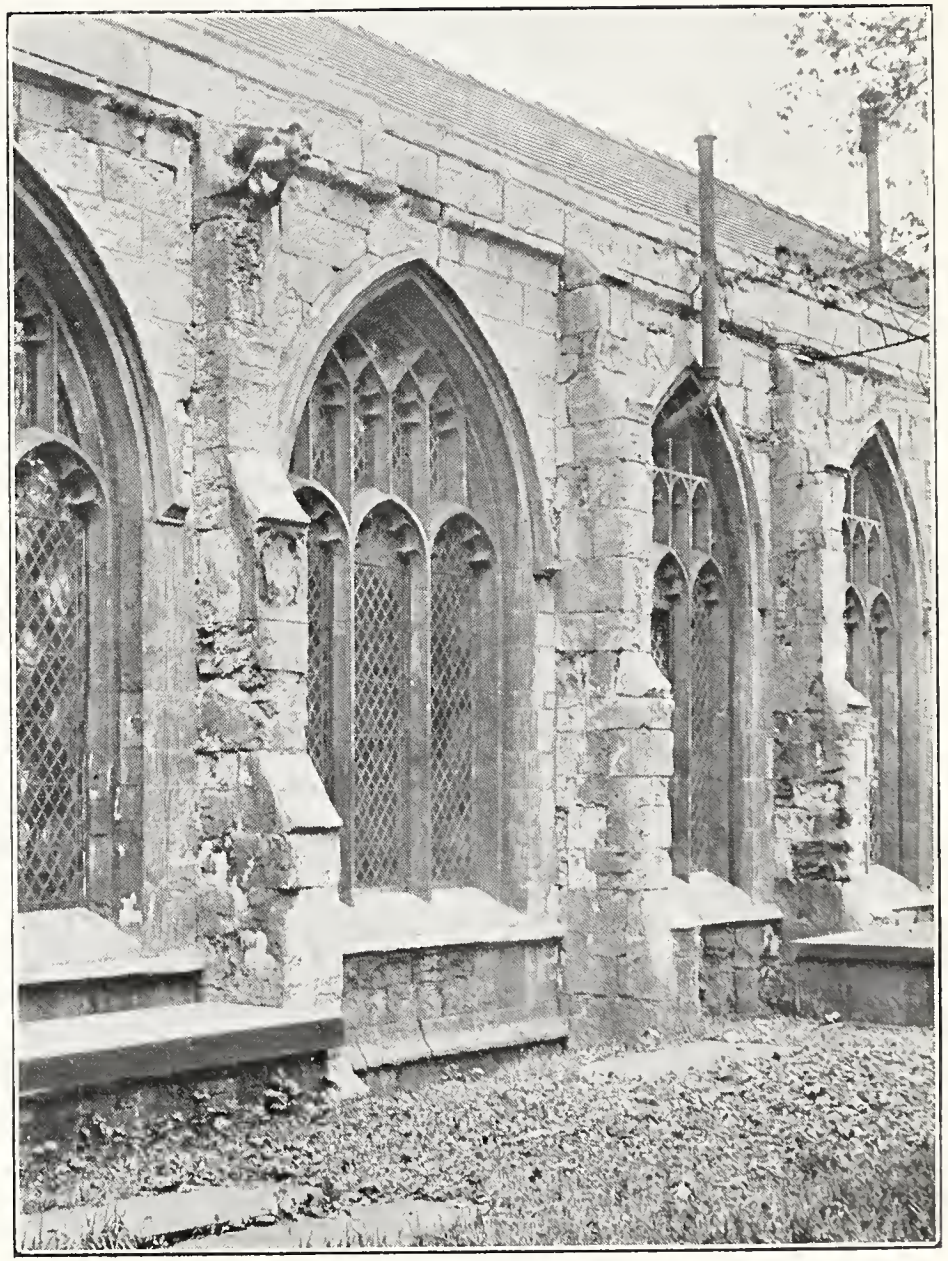


Fig. 2.

Fig. 1.

Fig. 2.

NATURAL HISTORY

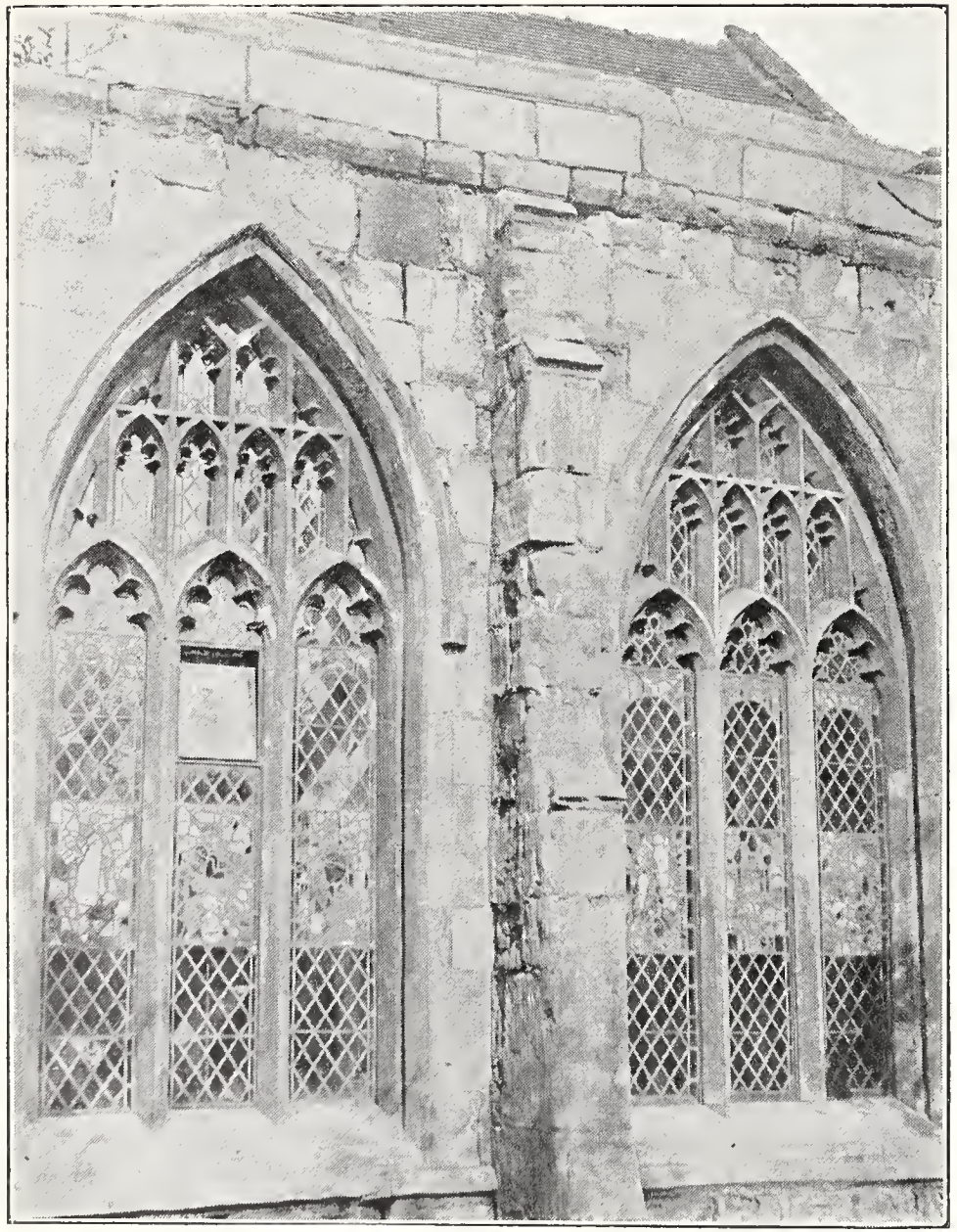


Fig. 1.

Fig. 2.

Notes on an Intrenchment on Holgate Hill, YORK.

By GEORGE BENSON, A.R.I.B.A.

ON referring to the Contour Map of York (plate I.), it will be noticed that the Intrenchment marked A, stands on the northern spur of the Mount range of hills which stretches from Bishopthorpe Road to Holgate. Westward, below the Intrenchment, is a water-way formerly of some importance, but now a poor stream. On the opposite side of the beck rises the Severus group of hills, from Mill Hill which is the same altitude as the Intrenchment, the hills rise to 125 feet on Severus Hill (D), so the Intrenchment may be an outer defence to the higher hills forming the Severus group. The general level of the river banks and the low lying land is about 25 feet above Ordnance Datum, whilst the summer level of the river Ouse is 16·75 feet, but in times of flood the river rises sometimes to 12 or 14 feet, causing a large area to be under water. The Intrenchment occupies a central position from Clifton Ings to the river at Nunthorpe, and commands the whole of the area within the winding of the river Ouse, and it overlooked the Plain of York. On the same range at CC (plate I.), two tumuli have survived to recent times, and near the beck outlet at B (plate I.), in excavating in 1868* on the site of the N.E.R. Gasworks, were found a number of flint inplements.

Plate II shows a plan and section of the Intrenchment, the levels are approximate.

On plate III and plate IV (figure 1) are depicted flint implements found at B (plate I.); those shown in plate III

* Yorkshire Archæological Journal, Vol. I., 1869, p. 47.

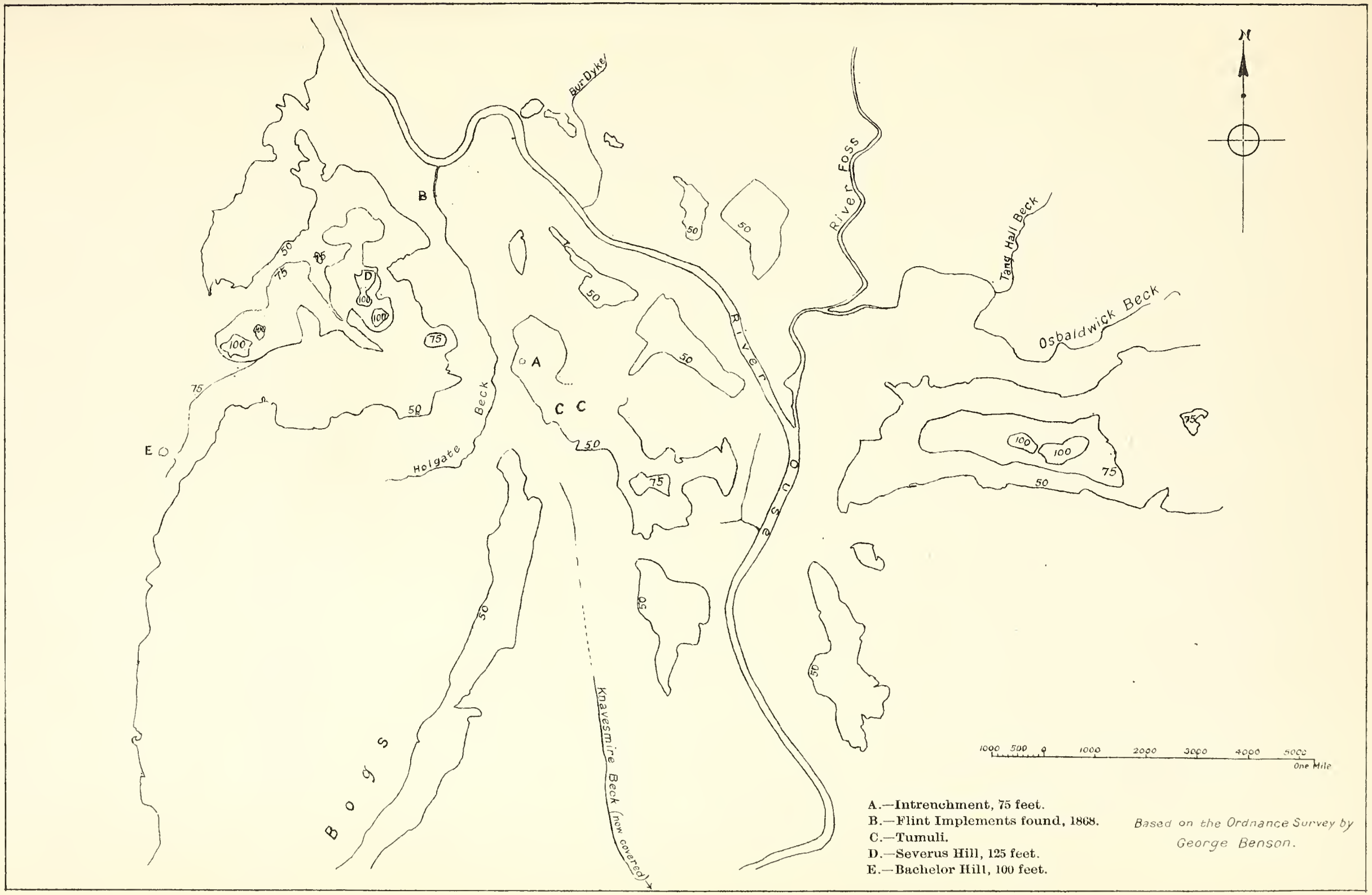
are in the possession of Mr. C. Wakefield, one of the Hon. Curators of the Museum Antiquities, and he kindly lent them for illustration. The lengths are as follows:—

No. 1—$2\frac{3}{4}$ in.	No. 6—$3\frac{5}{8}$ in.	No. 10—$\frac{13}{16}$ in.	No. 14—$1\frac{9}{16}$ in.
,, 2—2 ,,	,, 7—$6\frac{9}{16}$,,	,, 11—$\frac{3}{4}$,,	,, 15—$7\frac{1}{4}$,,
,, 3—$1\frac{3}{4}$,,	,, 8—$3\frac{1}{4}$,,	,, 12—$1\frac{9}{16}$,,	,, 16—$3\frac{1}{2}$,,
,, 4—$3\frac{5}{16}$,,	,, 9—$3\frac{7}{16}$,,	,, 13—1 ,,	,, 17—$2\frac{3}{4}$,,
,, 5—$3\frac{7}{16}$,,			

The group of implements shown on plate IV (figure 1), are in the Museum, and consist of axes, spear-heads, knives, and flakes of flint with one argillaceous sandstone axe. The lengths of the three central ones are $5\frac{1}{8}$, $5\frac{1}{4}$, and $5\frac{1}{2}$ inches respectively.

On plate IV (figure 2), the objects shown are in the Museum and consist of two hammer-heads, the larger one dioratic $8'' \times 3\frac{1}{4}'' \times 2\frac{3}{4}''$ thick, found at York, the other gritstone $6\frac{3}{4}'' \times 3'' \times 3''$ thick from Strensall. The three small very argillaceous sandstone axes were unearthed respectively at Dringhouses 1884, Haxby and York, and their sizes are $3\frac{1}{2}'' \times 2\frac{1}{4}''$, $4\frac{1}{2}'' \times 2\frac{3}{4}''$ and $4\frac{1}{2}'' \times 2\frac{1}{8}$ inch.

PRESENTED
31 MAY. 1905



A.—Intrenchment, 75 feet.
B.—Flint Implements found, 1868.
C.—Tumuli.
D.—Severus Hill, 125 feet.
E.—Bachelor Hill, 100 feet.

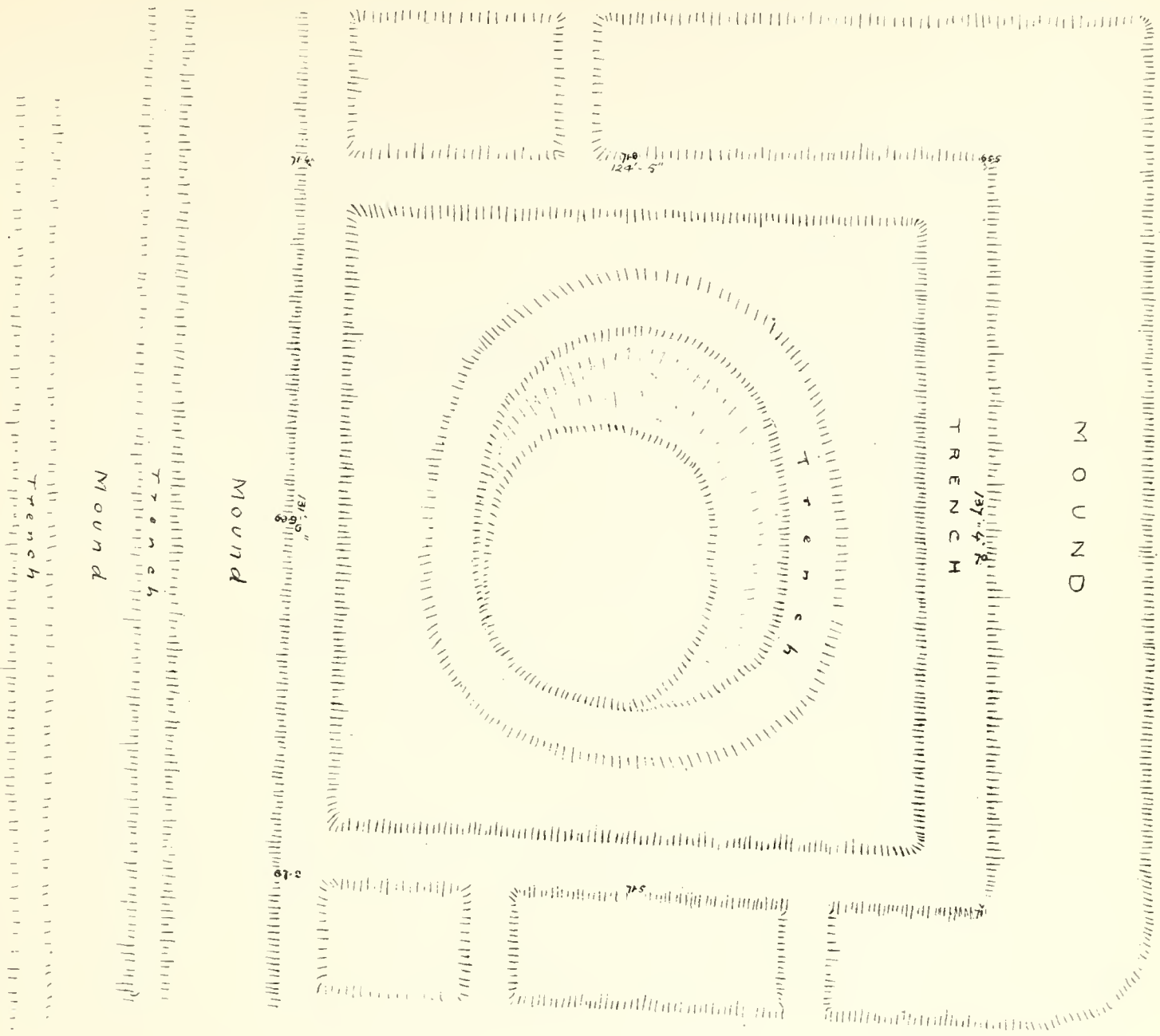
Based on the Ordnance Survey by George Benson.

PHOTO-LITHO. SPRAGUE & Co LTD LONDON.

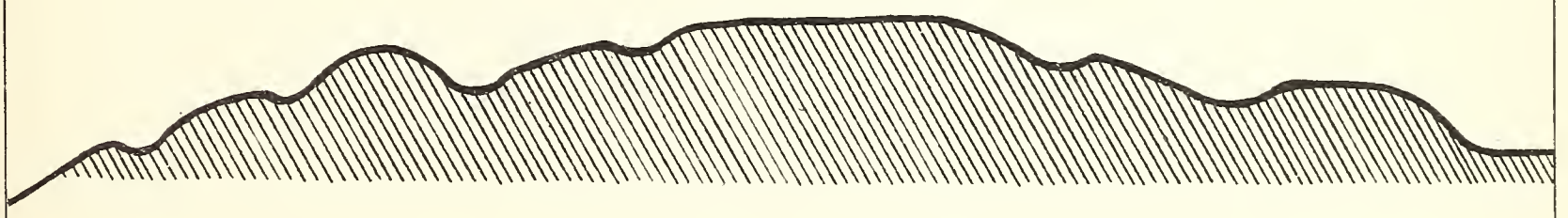
Plate I.

CONTOUR MAP OF YORK

INTRENCHMENT ON HOLGATE HILL - YORK



PLAN



SECTION

SCALES

HORIZONTAL 10 5 0 10 20 30 40 50 100 FEET

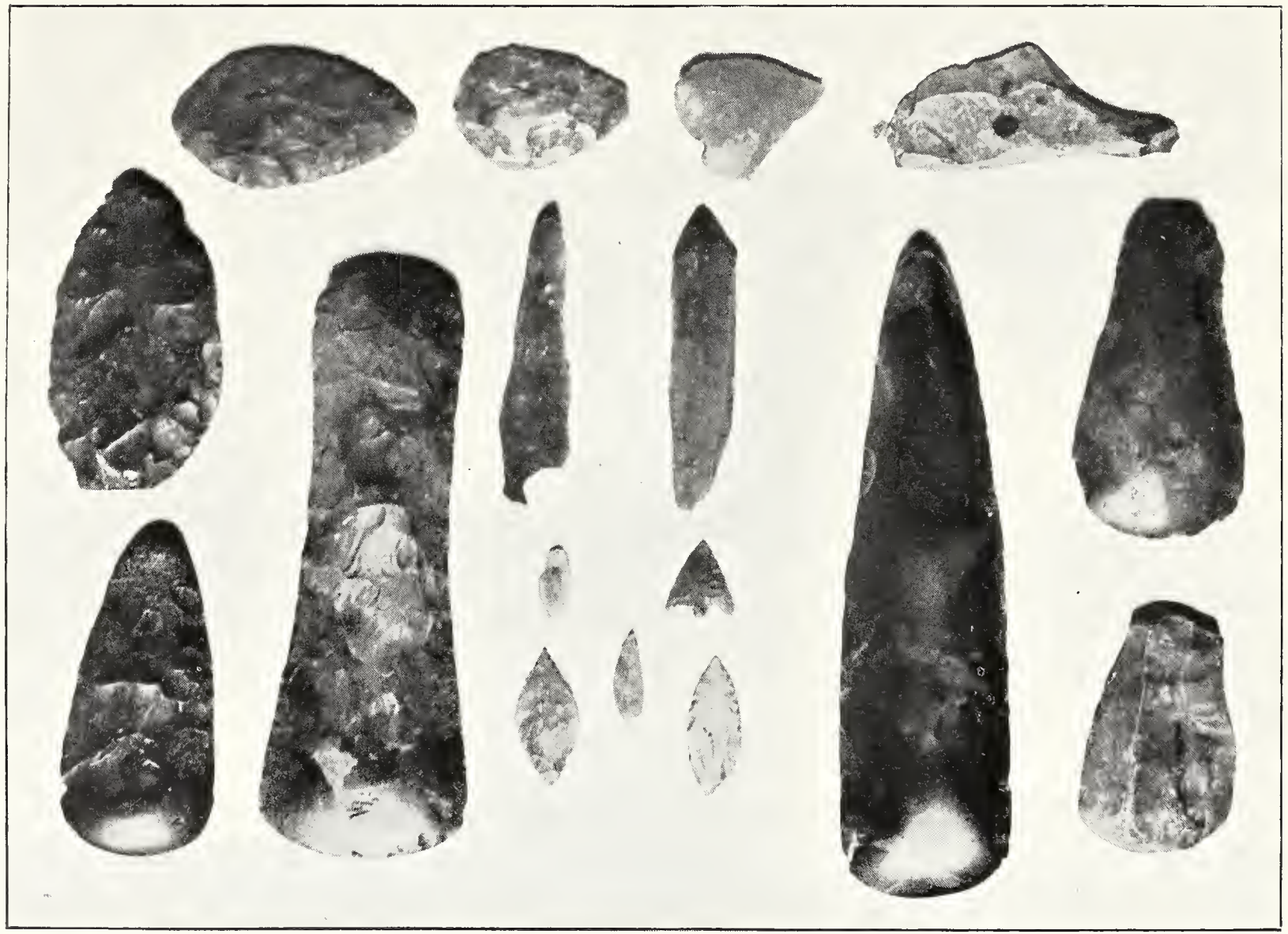
VERTICAL 10 5 0 10 20 30 40 50 FEET

Measured and Drawn by George Benson

1904

PHOTO-LITHO. SPRAGUE & Co LTD LOND JN.

1 2 3 4



5

16

6

17

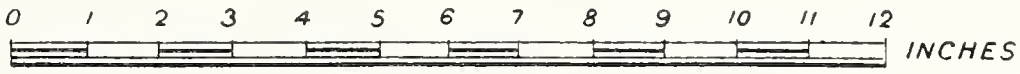
7 8 10 12 13 9 11 14 15

Flint Implements found 1868 on the Site of the N. E. Rly. Gasworks, York.

NATURAL HISTORY

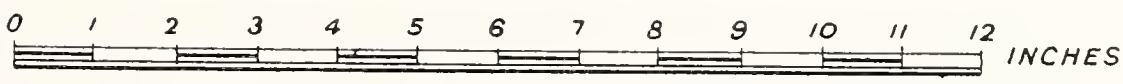
W. WATSON, Photo.

Fig. 1.—Implements found 1868 on the Site of N. E. Rly. Gasworks.



W. WATSON, Photo.

Fig. 2.—Hammer Heads and Axes found near York.



THE FOLLOWING PAPER

ON

"THE LIPARI ISLANDS"

Formed part of a Lecture given on Nov. 17th, 1904,

in the Society's Museum.

ON CERTAIN RECENT CHANGES IN THE CRATER OF STROMBOLI.

By TEMPEST ANDERSON, M.D., D.Sc.

(*From 'The Geographical Journal' for February*, 1905.)

In 1875, Prof. Judd, F.R.S., published in the *Geological Magazine* an admirable series of articles entitled "Contributions to the Study of Volcanoes."

The part dealing with the Lipari islands has been my constant companion and guide during two visits to those islands in 1888 and 1904, and it deals so fully with the subject, both from a historical and scientific point of view, that I feel it would be presumptuous to attempt to paraphrase the excellent description which he has so well written. Since his visit, however, Stromboli has continued in its wonted activity, generally of a moderate character, and so regular that it might almost be called rhythmical, though occasionally varied with periods of violence, and sometimes of almost total quiescence. As a result, certain changes have occurred in and about its crater; not on any very large scale, it is true, but sufficient to be of interest. When I visited the islands in 1888, I carried with me a camera, with which I took photographs * from selected points of view, believing that I was thus securing records more accurate and unbiassed than any mere verbal description; and in 1904 I revisited the islands, carrying the same camera and lenses, and took comparison photographs from as nearly as possible the same positions. These photographs form the basis of this paper, and have been supplemented by several other photographs and diagrams placed at my disposal by Prof. Riccò, of the Reale Osservatorio, Catania, and Mr. Geo. S. Eunson, of Northampton, who visited the volcano with the Geologists' Association in 1889. These fill up the gaps and show the changes during the intervening years.

Believing as I do that photographs should themselves form the record, and that the letterpress should be mainly explanatory of them, I have placed opposite each plate a note calling attention to the main points shown, and prefaced the whole by such a description of the island as may serve to make my story intelligible. To this I have added a summary of the main changes noticed.

Stromboli is the most easterly and northerly of the Lipari islands. It is situated north of Sicily, close to the track of steamers plying

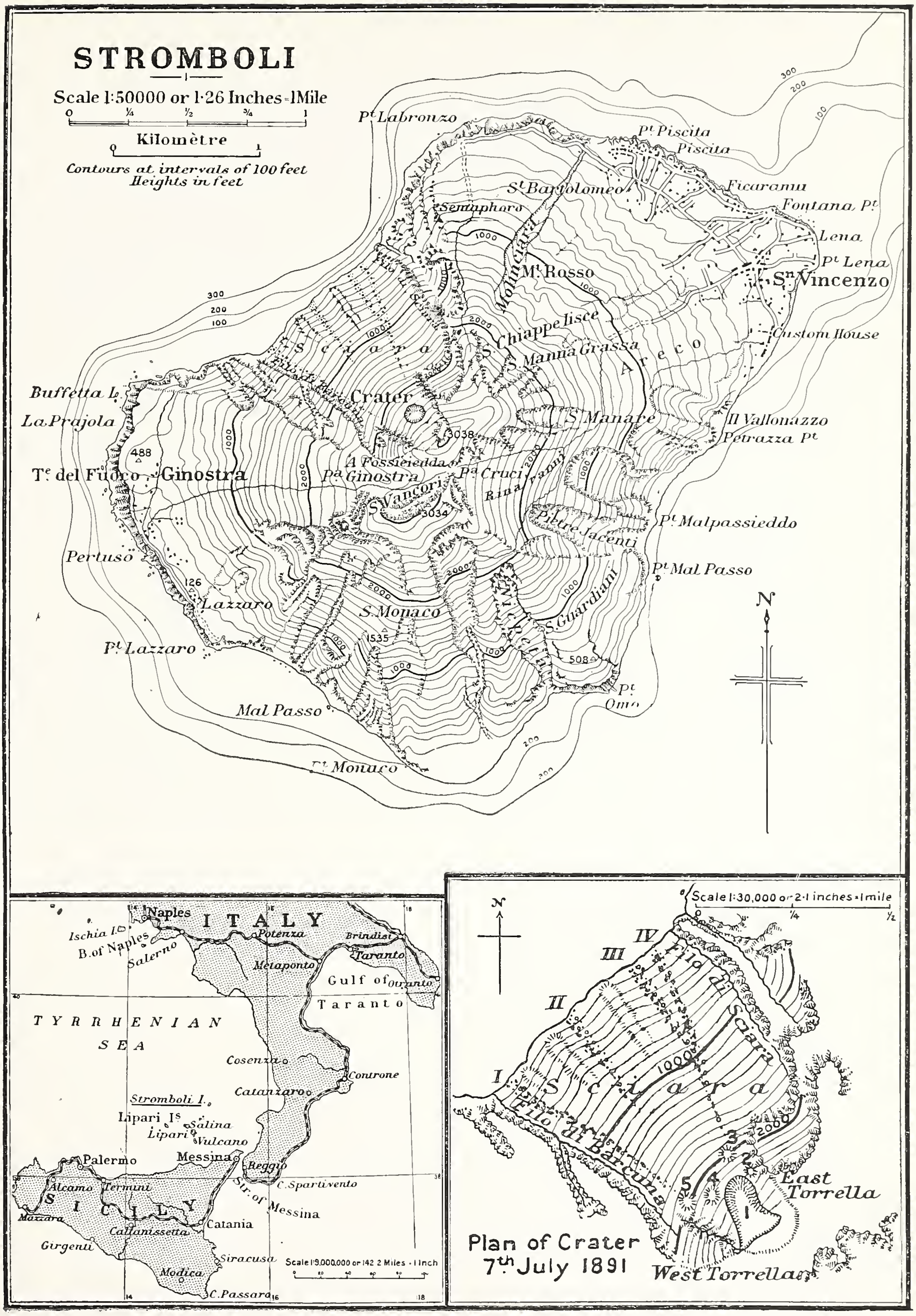
* See 'Volcanic Studies by Tempest Anderson.' Plates xx. to xxvii. Murray: 1903.

between Naples and the Straits of Messina, and is thus an object familiar to passengers to or from Egypt or the East, though comparatively few have landed on its shores. Its almost constant eruptions have gained it the name of the lighthouse of the Mediterranean. It is almost circular, as its old name Strongyle indicates, and rises as an irregular cone out of deep water. On the north-west side is the crater, "Apparato Eruttivo," of the Italian observers, and the Sciara or steep slope down which the ejecta roll into the sea. The Sciara is bounded on each side by two steep cliffs, Filo di Sciara and Filo di Baraona, which are formed, like the Sciara itself, of lava-streams, agglomerates, and dykes; in fact, of almost every kind of compact volcanic material, chiefly of basic composition.

The summit of the mountain consists of a crescentic ridge, the Serra di Vancori, open towards the north. It forms part of an old crater ring, and thus presents points of similarity to Somma. Inside the crescent ridge, and in places joined to it by irregular crests of rock, but mainly separated from it by a valley, "A Fossieiedda," similar to the Atrio del Cavallo of Vesuvius, is another crescentic ridge, which, on my first visit in 1888, in many places immediately surrounded the active crater, the bottom of which was visible therefrom. In 1904, owing to changes presently to be described, this view was not obtainable.

Connected with its two extremities, and immediately overlooking the sides of the crater, are two conspicuous pointed rocks, the Torrelle,* which partly obstruct the view of the crater when viewed from the cliffs overlooking the Sciara on its north-east and south-west respectively. These Torrelle, being practically unaltered by ordinary eruptions, present good points of comparison for estimating the changes that take place, and one or other of them is included in most of the photographs. Between the two Torrelle, in the midst of a sort of amphitheatre formed by them and the crescentic ridge last mentioned, is the crater and its appurtenances, "The Apparato Eruttivo" of Italian observers. This amphitheatre is open to the north-west, and from its open side beyond the craters the steep slope of the Sciara extends down into the sea. This Sciara, as is well known, is one of the most peculiar features of this volcano. It extends at an angle of about 35°, which is the "angle of repose" for the kind of material of which it is composed, down into the deep water of the Mediterranean; and though the volcano has certainly been in almost constant eruption during the whole of the historic period and probably much longer, it has never been able to build up a talus sufficient to rise to the level of the sea, much less to that of the lip of the crater, about which, according to the analogy of other volcanoes, it might have been expected to have built up a cone on this side comparable to the portion on the south described above,

* We heard these rocks called by the natives Torrelle ["little towers"] and Torrione ["big towers"]. They are spoken of by Profs. Riccò and Mercali as Faraglioni.


STROMBOLI
Scale 1:50000 or 1·26 Inches = 1 Mile
Kilomètre
Contours at intervals of 100 feet
Heights in feet
Pt. Labronzo
Pt. Piscita
Piscita
St. Bartolomeo
Ficaramu
Fontana Pt.
Lena
Pt. Lena
Sn. Vincenzo
Semaphoro
Mt. Rosso
Molincaru
Custom House
S. Chiappe lisce
S. Manna Grassa
Areco
Sciara
Filo di Barcuna
Crater
S. Manare
Il Vallonazzo
Petrazza Pt.
Buffetta L.
La Prajola
488
3038
A Fossicieddu
Pa. Ginostra
Pa. Cruci
Rina Fani
Te. del Fuoco
Ginostra
S. Vancori
3034
Pietre Jacenti
Pt. Malpassieddo
Pertuso
Pt. Mal Passo
126
Lazzaro
S. Monaco
1535
S. Guardiani
Pt. Lazzaro
508
Pt. Omo
Mal Passo
Pt. Monaco
N
ITALY
Naples
Ischia I.
B. of Naples
Salerno
Potenza
Brindisi
Taranto
Metaponto
Gulf of Otranto
Taranto
TYRRHENIAN SEA
Cosenza
Cotrone
Catanzaro
Stromboli I.
Lipari Is.
Salina
Lipari
Vulcano
Palermo
Messina
Reggio
C. Spartivento
Alcamo
Termini
SICILY
Str. of Messina
Mazzara
Caltanissetta
Catania
Girgenti
Siracusa
Modica
C. Passaro
Scale 1:9,000,000 or 142·2 Miles = 1 Inch
Scale 1:30,000 or 2·1 inches = 1 mile
IV
III
II
I
Filo di Sciara
Sciara
Filo di Barcuna
East Torrella
West Torrella
Plan of Crater
7th July 1891

NATURAL HISTORY

which cone in that case it would have completed. As it is, the summit of the mountain is about 3000 feet above the sea-level, while the eruptions take place about 600 feet lower, *i.e.* at a height of about 2400 feet.

When I first visited the mountain in 1888 (see Plate II., which is from a photograph taken by me at the time), the crater was an oval hollow, which I afterwards roughly estimated at 60 or 70 yards in diameter, but which, on examining the place again in 1904, I believe to have been much larger. I made a second ascent to check this, but was prevented by bad weather from completing the observation. Prof. Judd's estimate of 400 feet was probably nearer the mark. In 1888 there were two small cones, one on the edge of the Sciara near its western end, from which the explosions took place, another in the hollow of the crater near its eastern end, which only gave out vapour. In 1904 the accumulation of materials thrown out by the volcano had filled this crater and continued the slope of the Sciara upwards, so that the explosions no longer took place from the hollow of the crater or even from its lip, but from mouths on the slope of the Sciara. I have no reason to think that the main axis of eruption has shifted materially down the Sciara towards the sea, notwithstanding the appearance to the contrary, which is, I believe, due to the piling up of fragments to the south-east of the vents on the site of the crater seen in 1888. It is interesting to note that in 1888 the fumarolic activity was chiefly at the north-east of the crater, then a hollow, and the explosions took place from the western portion. In 1904 the relation still continues; the fumarolic area, now much raised into a mound, as shown in Plate IV., is still at the north-eastern portion of the eruptive area, while the main explosions take place from the western parts. It is, however, noteworthy that the flow of lava in 1891 appears to have proceeded from the eastern part of the crater. These facts will have to be taken into account by any one who frames a new theory of the mechanism of Stromboli.

Since my return home, I have endeavoured to collect photographic and other information so as to fill in the changes which have occurred in the interval, and present them in a connected form.

Prof. Judd, F.R.S., has kindly placed at my disposal several papers from the *Atti della Società Italiana di Scienze Naturali*, by Prof. Mercali, of Naples, from which the following information is condensed.

On February 4–5, 1879, a severe eruption of Stromboli took place, and such a quantity of pumice was thrown out that the sea in the neighbourhood is stated to have looked like dry land. There is no mention of any lava being discharged.*

* Mercali, *Atti della Soc. Ital. di Sci. Nat.*, vol. 24. Milano, 1881. This number contains a good list of the ancient eruptions of Stromboli and a discussion of Mallet's theory.

On November 17, 1882, and following days, a severe eruption took place. Towards the commencement there was an explosion more severe than any remembered by the inhabitants, and five new bocche opened on the north-west slope of the Sciara, about 100 metres below the usually active crater. Red-hot stones were thrown on to the southern slopes of the mountain, and one weighing several tons as far as Ginostra. On November 27 the eruption was so severe that the inhabitants thought of emigrating. No lava-flow took place. Mercali contrasts this fact with the usual sequence of events on Etna and Vesuvius.*

On February 25, 1888, there was a severe earthquake on Stromboli, and others on March 21 and May 22. They were local, and not felt on the other islands. Mercali concludes that they were connected with the local volcanic activity, although the eruptions continued with their usual degree of intensity, and that they were different from the Calabrian earthquakes. Such local earthquakes are common in the Lipari islands.

Mercali visited Stromboli in September, 1888, and found a single active crater. In February, 1889, he found the crater more active and notably changed. The bocca active in September, 1888, was now quiet and in a fumarolic condition, and three new bocche had opened on the edge of the Sciara, one of which gave eruptions with a rhythm independent of the others.

In June, 1891, Profs. A. Riccò, of Catania, and G. Mercali, of Naples, visited the island and embodied their observations in a valuable memoir † from which the plan is copied by permission, and the nomenclature and numbering of the bocche adopted by them has also been followed throughout this paper.

They found a large crater, No. 1, corresponding to that described above by myself in 1888, and figured in Plate II., and four smaller bocche on or about its northern edge at the lip of the Sciara. Bocche Nos. 2 and 3, towards the eastern side of the crater, were considered to be situated on one radial fissure, and they appear to correspond in position to the smoking cone of 1888, and to the fumarolic area observed in the same region in 1904. Bocche Nos. 4 and 5, towards the western portion of the crater, are described as situated on another radial fissure. They correspond in position to the cone from which the explosive eruptions took place in 1888, and to the bocche from which similar explosions still took place in 1904.

The writers also describe and mark three streams of lava, ii., iii., iv.,

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* Mercali, *op. cit.*, vol. 27, 1884.

† 'Sopra il Periodo Eruttivo dello Stromboli, Relazione dei Professori A. Riccò e G. Mercali con appendice del Ingegnere S. Arcidiacono estratto dagli Annali dell' Uffizio centrale Meteorologico e Geodinamico,' Serie 2, Parte iii. vol. 11, 1889. Roma : Tip. dell' unione Coop., edit. 1892.

as having run down the Sciara in June, 1891, from bocca 3. It is noticeable that this discharge of lava took place from a bocca which usually is quiet and fumarolic in its action, and not from the usually explosive area 4 and 5.

In 1889 the English Geologists' Association visited Stromboli, and Plate V., from a photograph by Mr. G. S. Eunson, who was one of the party, shows that changes were already commencing.

Signor Guiseppe Renda, postmaster of Stromboli, informed me that about 1890 a stream of lava with three tongues issued from the crater and ran down the Sciara. He fixed the date as having been two years after the great eruption of Vulcano in 1898. This corresponds probably with the eruption described by Profs. Riccò and Mercali as above.

Scattered through the volumes of the *Bolletino della Societa Sismologica Italiana* since their commencement in 1895, are numerous notices by Prof. Riccò and Signor Arcidiacono, both of the Reale Osservatorio of Catania, on the state of the activity of the volcanoes of Sicily and the adjacent islands. These are virtually inaccessible to English readers, as only about two copies appear to find their way into this country, but, thanks to the courtesy of Prof. Milne, F.R.S., I have been able to abstract the following information.

1895. Stromboli was in its usual characteristic state of eruption, except that on March 29 a very violent explosion occurred in correspondence with a slight shock of earthquake felt in several places in Calabria. There followed towards the end of the year several violent explosions sufficiently severe to shake the island. A small stream of lava issued from the Sciara below the bocca 4 this year or in 1894.

1896. Stromboli was in its usual condition during the whole year, except that on July 13 there was a severe explosion, by which masses of incandescent lava and scoria were thrown to a great distance, and some damage was done to the vineyards by fires in consequence. The whole island was enveloped in a cloud of ash, and the noise was heard very plainly at Lipari. A slight shock of earthquake was felt at Palini, in Calabria.

1897. Nothing special was recorded.

1898. Stromboli was chiefly in its usual state. It was more active than usual in October, and unusually quiet in November. On September 14, 1898, Signor A. Semprivi Capo Posto Semaphoro di Stromboli ascended the mountain, and, all being quiet, was able to ascend the western Faraglioni (Torrella), commanding a good view of the craters from above, and found the relative positions of the bocche had not materially varied since the original report by Prof. Riccò, Mercali, and Archidiacono in 1891. No. 5 was still in action, but its direction somewhat changed, so that it could scarcely be seen from the semaphore. It appeared to be the point from which most of the larger explosions took place. On October 28, 1898, Prof.

Riccò ascended the mountain and observed a succession of eruptions. Four considerable ones, besides smaller ones, took place from bocca No. 5, some moderate ones from No. 4, while Nos. 2 and 3 discharged masses of smoke.

1899. Stromboli was mostly in its usual condition, with occasional increases of activity. There was a slight increase of activity at the beginning of February. On March 6 a very violent explosion occurred in one of the side craters, followed by the formation of two small cones in its floor, and on the following days increased activity continued. During this year Prof. Matteucci stayed nine days on Stromboli, and made six ascents. The eruptions all took place from a little eccentric cone on the southern slope of a large crater of explosion, probably 4, 4 bis, or 5, and there were six other bocche, but they only emitted smoke. The mountain was again active in November, and about the 10th of that month a new bocca, No. 6, opened on the Sciara below and to the north-east of No. 5.

1900. Stromboli was unusually active from March to November, especially in October. Many of the explosions were sufficiently powerful to shake the whole island and cover it with dust. The chief explosions were from bocche 4, 4 bis, and 5, all situated towards the western part of the Sciara. The later observations are not yet published, but Signor Liberator Castalan, syndic of Filicudi, whose house commands a full view of Stromboli, informed me that there was a severe eruption of Stromboli in December, 1903, and January, 1904, also others five and ten years previously. Between those times nothing special occurred, but the mountain was never absolutely quiet.

Signor Guiseppe Renda, Postmaster of Stromboli, also spoke of an eruption in November and December, 1903, during which a stream of lava ran down the Sciara from about December 10 to 20, and a new bocca formed on the north-eastern part of the eruptive area near the Torrione (Torrella ?).

There was an earthquake in February, 1904.

1904. I stayed four days on the island, and ascended the cone on April 20 and 22. The photographs were taken April 20.

On May 30, 1904, Signor D. Vasalo, Capo Posto del Semaphoro di Stromboli,* made an ascent of the mountain, and, the craters being quiet, was able to ascend the eastern Faraglioni (Torrella), from whence he had a near view of the "Apparato Eruttivo." He found in the part which I have called the fumarolic area a new bocca, which he calls No. 7. It is about 20 metres east-south-east from bocca 2, and about 6 metres by 4 metres in extent. It was in a state of the weakest activity, and emitted whitish smoke, apparently being in a similar condition to that on April 20, when I photographed the locality, as shown in Plate IV.

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* See *Boll. della Soc. Sism. Ital.*, vol. **10**.

He also found the large crater No. 1 filled up as described above, probably during the eruption of November, 1903. It is very satisfactory to find my observations in this respect independently confirmed.

He also climbed the western Faraglioni (Torrella) and noted the condition of the western bocche, which were still the most active.

The following information, though not strictly scientific, may be of interest or use to intending visitors.

The southern part of the island is precipitous, and for the most part uncultivated. The north-eastern part is gently sloping, and presents a large village (St. Vincenzo), or perhaps rather a large straggling group of houses, with two churches, situated among vineyards. From the cultivation of these and from fishing, the inhabitants, who number perhaps 4000, derive a precarious livelihood. To the west of the village, and on a promontory near the eastern side of the Sciara, is a signal station maintained by the Italian Government, where the passage of vessels is recorded and reported. One of the officials here is charged with keeping a diary of the state of activity of the volcano, and he reports to Prof. Riccò, of the observatory of Catania.

The only other person who seemed to know anything about or take any interest in the doings of the volcano was the postmaster, Signor Guiseppe Renda.

There is another small village, Ginostra, to the west of the island. There is no inn on the island, but tolerable lodgings are obtainable at the house of Don Antonio Renda, who did his best to make us comfortable. A small steamer calls twice a week. It goes daily from Milazzo to Lipari, and some one or other of the islands, and there is a steamer once a week to Messina. There is no harbour, but passengers are landed in small boats. If the wind is unfavourable, landing is sometimes impossible.

We took as guide Francesco Conti from Lipari, who has been in America and speaks some English.

In conclusion, I wish to express my grateful thanks to H.I.H. the Archduke Ludwig Salvator of Tuscany, for allowing the reproduction of the map from his monumental work, 'Die Liparischen Inseln,' Siebendes Heft (Stromboli, 1896); to Prof. Riccò, of Catania, for much valuable assistance, and for permitting the reproduction of the inset plan of the crater and Sciara; to my valued friends Prof. Bonney, F.R.S., Prof. Judd, F.R.S., Prof. Milne, F.R.S., and George Yeld, my companion during the voyage, for much kind assistance and counsel; and to Mr. Geo. S. Eunson, of Northampton, for the use of the negative of Plate V.

PLATE I.

THE SERRA DI VANCORI, STROMBOLI.

(*From a Photograph by the Author*, 1904.)

In the distance to the right and in the centre is the crescentic range of cliffs forming the southern part of the old wall of the crater. It is composed chiefly of tuffs and agglomerates, with, I believe, a few small flows of compact lava. The slope in the foreground and to the left is part of the ridge overlooking the site of the crater existing in 1888, but now much filled up. It is composed of fragmentary ejecta, including many large masses of scoria and a few very perfect volcanic bombs. The depression in the distance to the left is the Purtedda di Cruci, over which the track from Ginostra leads down to San Vincenzo, the chief village of the island.

Purtedda di Cruci.

Old Crater Wall.

STROMBOLI. THE SERRA DI VANCORI

NATURAL HISTORY

Bocca 4.

Bocche 2 and 3.

STROMBOLI : THE CRATER FROM ABOVE. 1888.

PLATE II.

STROMBOLI—THE CRATER FROM ABOVE.

(*From 'Volcanic Studies,' Plate XXII, by Tempest Anderson.*)

This photograph shows the condition of the crater in 1888. It was taken from the slope extending down from the north side of the ridge shown to the left of the last plate, towards the crater, and with the camera pointed in a northerly direction. Owing to the necessity of tilting the camera forward in order to obtain this view, the slope in the foreground is much foreshortened. It is in reality very steep—in fact, "at the angle of repose." The crater was an elliptical hollow, probably at least 60 or 70 yards in its longer diameter, and contained two small secondary cones. A considerable amount of vapour escaped steadily from the cone to the right, which appears to be on the site of bocche 2 and 3 (Riccò and Mercali), and also from several fumaroles. Explosions took place from the cone to the left, bocca No. 4, every few minutes. The further or north-west side of the crater was the upper edge of the Sciara, down which such of the ejecta as fell in that direction rolled into the sea.

When I visited the same spot in 1904, intending to take a comparison photograph, I found the crater quite filled up, and the slope of the Sciara continued upwards over its site, so as to form a great ridge right across the foreground of this picture, which concealed the bocca from view. There was a hollow in front of the ridge, but further up the slope than the old crater, and it contained no fumaroles.

PLATE III.

STROMBOLI—THE SCIARA FROM THE NORTH-EAST.

(From 'Volcanic Studies,' Plate XXI., by Tempest Anderson.)

This photograph, taken by the author in 1888 from the ridge overlooking the north-east side of the Sciara, and consequently looking south-west, shows the crater partly concealed from view behind the eastern Torrella, the conspicuous pointed rock to the left, in the distance behind which the western Torrella is just visible. The lip of the crater is just above a large wedge-shaped dyke, which also appears in the next plate. The slope extending down to the right is the Sciara. It reaches from the edge of the crater down to the sea at a slope of about 30°, and its width at the water's edge is about 3000 feet. The edge of the crater has an elevation of about 2400 feet. To the left is a rugged slope, which leads from the left of the Torrella down to the Sciara and the sea, and down which ejecta are thrown during the larger eruptions.

Western Torrella.
Crater.
Eastern Torrella. Wedge-shaped dyke.
Fila di Barcuna
Sciara.

STROMBOLI: THE SCIARA FROM THE NORTH-EAST. 1888.

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STROMBOLI: THE SCIARA FROM THE NORTH-EAST. 1904.

PLATE IV.

STROMBOLI—THE SCIARA FROM THE NORTH-EAST.

(*From a Photograph by the Author*, 1904.)

This photograph was taken on April 20, 1904, from the cliff overlooking the Sciara on the north-east, and thus from the same general direction as the last, but perhaps a little higher up the slope, and, being taken with a longer-focus lens, less of the subject is included. To the right is the slope of the Sciara leading down to the sea, with the cliff behind it corresponding to the one on which we are standing. In the centre is the Torrella, with the slope of the Sciara continued up behind it, and showing the large fumarolic area (bocche 2 and 3). This area was much covered with yellow incrustations, and vapours escaped from innumerable points and cracks. There was one small bocca, from which very feeble explosions took place. They were more frequent than, and quite independent in rhythm from, those taking place from the more western parts. In the background are seen the products of an explosion which has just taken place from a bocca beyond the limits of view, probably No. 4 or 5. In the foreground rather to the right is the same wedge-shaped dyke as in the last plate. Compare the position of the crater in relation to this dyke and the Torrella with that shown in the last plate.

PLATE V.

STROMBOLI—THE CRATER FROM THE WEST.

This photograph was taken by George S. Eunson, of Northampton, on September 19, 1889, during a visit to the Lipari islands along with the Geologists' Association.

It is taken from the end of a projecting ridge to the west of the crater and to the north of the Purtedda di Ginostra (see map and Plate VI., Fig. 1), and consequently in exactly the opposite direction to Plates III. and IV. To the right is the western Torrella, and in the distance behind is the eastern Torrella and the adjacent heights. Between the two is the Apparato Eruttivo, as it is appropriately called by the Italian observers. The bocca which emits smoke in the centre of the picture, and from which the chief explosions take place, appears to be the same as the cone shown at the left of Plate II., but its cone is already beginning to grow a little towards the larger crater which still exists behind and to the right of it. It is probably the same as bocca No. 4 or 5 of Profs. Riccò and Mercali. A small bocca (perhaps No. 3) on the skyline to the left throws out small masses of lava. The Sciara on the left or north side stretches down to the sea, as shown in the previous plates.

Sciara. Bocca 3. Bocca 4. Eastern Heights. Bocca 1. Western Torrella.

STROMBOLI: THE CRATER FROM THE WEST. 1889.

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FIG. 1. STROMBOLI FROM THE SEA. 1904.

FIG. 2. THE CRATER FROM THE WEST. 1891.

PLATE VI.

PLATE VI.—Fig. 1.

Stromboli from the Sea, 1904.

This photograph, taken by the author from a small steamer, shows the Sciara in the centre and towards the left of the picture extending from the craters down to the sea. Rather below the centre is a rough patch, the remains of a stream of lava, probably one of those of June 24-30, 1891.

The other points of interest can be best identified by the letters.

a. The Filo del Fuoco, otherwise Fila d'a Sciara, the rocky precipice bounding the sciara on the east. Plates III. and IV. were taken from near its upper end. The Semaforo, or signal station, is situated on this slope outside the lower part of the plate.

b. Eastern Torrella, shown more in detail in Plate III.

c. Fumarolic area on site of bocche 2 and 3 (see Plate IV.).

d. Bocche 4 and 5.

e. Western Torrella (see Plates V., VI. (Fig. 2), VII., VIII., IX., X., and XI.).

f. Filo di Baraona, otherwise Fila di Barcuna, the rocky precipice bounding the Sciara on the west.

The plates mentioned in *e* were taken from a point at its summit.

PLATE VI.—Fig. 2.

The Crater of Stromboli from the West, 1891.

This photograph, kindly placed at my disposal by Prof. Riccò, and taken by Ing. S. Arcidiacono, his assistant, shows the crater of Stromboli from the west on September 3, 1891. It appears to have been taken from the same place as Plate V. To the right is the western Torrella ; in the distance to the left the eastern Torrella, with the east cliff bounding the Sciara just showing behind it at the edge of the picture. Between the two Torrelle are more than one eruptive bocca, apparently Nos. 3 and 4. The large inactive crater I is behind the western Torrella. It is noticeable that the whole of this "Apparato Eruttivo" is well below the level of the line joining the two Torrelle, though rising higher than in the earlier photographs.

The slope of the Sciara extends from the crater down to the left of the plate.

PLATE VII.

The Crater of Stromboli from the West, 1895.

This photograph, placed at my disposal by Prof. Riccò, of Catania, and taken by him on November 21, 1895, apparently from nearly the same point as the last two, shows the condition of the crater above four years later. The western and eastern Torrella occupy corresponding positions to the right and left of the picture respectively. The eruptive area between them shows several bocche, and the slope of the Sciara extends higher than before to the right of the main mouths. The numbers of the bocche are from a figure in a brochure, 'Stato presente dei fenomeni in 1898, Riccò.' The large crater No. 1 is behind the western Torrella.

STROMBOLI: THE CRATER FROM THE WEST. 1895.

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Bocca 3.
Bocca 4 or 5.

W. Torrella.

THE CRATER FROM THE WEST. 1904.

PLATE VIII.

STROMBOLI—THE CRATER FROM THE WEST.

This photograph, taken by the author April 20, 1904, and from the same point as the last, shows the condition eight and a half years later. The western Torrella is conspicuous as before, but the slope of the Sciara now extends far up to the right beyond the active craters, and conceals the eastern Torrella almost entirely from view. It fills up the large old crater No. 1, which was behind the Torrella. The large bocca in the front of the middle distance was that from which all the explosions took place during my visit, and appears to be No. 4 or 5 of Prof. Riccò's numeration. Those beyond it gave issue to vapour only.

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PLATES IX., X., AND XI.

These three photographs were all taken by the author on April 20, 1904, from the same point as Plate VIII., but, not being all done with the same lens, differ in the amount of the subject included. They show different stages of several explosions, all from one bocca. The form assumed, like a cauliflower or a bunch of grapes, though usual in volcanic explosions, is not confined to them. It is often assumed by a mixture of heated gases holding fine powder in suspension, issuing from the chimney of a steamer as well as from that of a volcano. Plate XI. in particular shows the volcanic dust dropping out of the cloud of vapour.

STROMBOLI: AN EXPLOSION. EARLY STAGE.

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STROMBOLI: AN EXPLOSION. LATER STAGE.

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STROMBOLI: AN EXPLOSION. ADVANCED STAGE.

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