

S. 80.

The Naturalist

(Sept 22, 1905)

PROCEEDINGS

OF THE

CLEVELAND NATURALISTS'

FIELD CLUB

1903-04.

VOL. II. PART I.

Edited by the Rev. J. Cowley Fowler, B.A., F.G.S.

PRICE TWO SHILLINGS

(FREE TO MEMBERS).

MIDDLESBROUGH:
T. WOOLSTON, PRINTER AND PUBLISHER.

1905.



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15 JUN 20



REV. J. HAWELL, M.A., F.G.S.

THE REV. JOHN HAWELL, M.A., F.G.S.

Born April 3rd., 1855. Died at Keswick, June 21st, 1904.

In attempting to write a short sketch of the late Editor of The Proceedings of the Cleveland Naturalists' Field Club we do so with profound regret at the loss of such a brilliant member, who was always ready to help it on in every possible way. He loomed large in the history of the Society over which he exercised a predominating influence. The stream of life from which he flowed was one that has added strength and honour to the English nation for many generations, but which now is running dry like the old Squirearchy. His father was what is known in the lake district as a "Statesman," or "Estatesman,"—a class from which Darwin himself was descended; his ancestors appearing to have been substantial yeomen in the Northern borders of Lincolnshire. We are indebted to Mrs. Hawell for the following notes on her late husband's life and work.

"Rev. John Hawell, M.A., the Vicarage, Ingleby Greenhow, son of the late Isaac Hawell, of Croft House, Greystoke Gill, Cumberland, born at Lonscale, near Keswick, April 3rd, 1855; educated at the Grammar Schools of Blencowe and St. Bees, Cumberland, and Queen's College, Oxford, Third Class Natural Science, 1878; B.A., 1878, M.A., 1882. Ordained by Dr. Thompson, Archbishop of York; Deacon, 1878; Priest, 1879; Vicar of Ingleby Greenhow, 1880; formerly Assistant Curate of All Saints, Pontefract, 1878-1879; Chaplain of the Proprietary Church at Easby-in-Cleveland from 1899-1904; Fellow of the Geological Society of London, 1898; Chairman of the Ingleby Greenhow Parish Council, Member of the Councils of the Yorkshire Geological and Polytechnic Society, The Yorkshire Naturalists' Union and the Yorkshire Parish Register Society, Hon. Local Secretary for the National Society, the Church Defence Committee, the Curate's Augmentation Fund, the Diocesan Education Society, and the Church Society for the Promotion of Kindness to Animals, President of the Cleveland Naturalists' Field Club, Author of various geological papers printed in the Proceedings of the Yorkshire Geological Society, &c.,

Editor of the "Ingleby Greenhow Parish Register, 1539-1800," with Historical Introduction; and the "Stokesley Parish Register, 1571-1750." Married Sarah Richardson, younger daughter of Frederick Browne, of Blencowe House, Blencowe, Cumberland, and granddaughter of the Rev. John Browne, Vicar of Ashford and Taddington, Derbyshire."

He was also Secretary of the Conchology Sectional Committee and Member of the Geology Sectional Committee of the Cleveland Naturalists' Field Club. On his proposal, in 1895, Sectional Committees were appointed for the purpose of recording and making lists of the fauna and flora of the Cleveland District. The result of the formation of these Committees has been the publication of Proceedings by the Club, these having been published for each year since 1895. The Rev. J. Hawell edited them from the first and was one of the principal contributors.

Papers contributed by the Rev. J. Hawell to the Proceedings :

List of the Mollusca of the Cleveland District.

Bajocian Plant Beds of Yorkshire.

The Evolution of Cleveland Scenery.

Rainfall Records.

Memoirs of Rev. Canon Atkinson and Dr. R. T. Manson.

He frequently acted as guide at summer meetings, the last occasion on which he attended one being at Ingleby on August 29th of last year (1903), when he arranged the programme and acted as guide.

He also lectured to our Society at the Winter Meetings, papers delivered by him being "on the collection and study of Fossils" and on "The Evolution of Cleveland Scenery."

The Society owes its present position and recent greatly improved membership in a great measure to Mr. Hawell's work and influence.

He assisted Professor Kendall, F.G.S., and others in the great work on the Glacier Lake Systems of North Yorks.

He was an all-round Naturalist. Besides the subjects he was specially well up in viz :—Geology and Conchology, he took an interest in other sections, and made notes (and collected) on Coleoptera and other Insects, Birds, the Flora, &c., especially with regard to his own district."

“Coming events cast their shadows before them.” This was verified in the case of Mr. Hawell; even as a small boy he began a museum—many collections of various things—labelling them in a scientific manner; with his growth grew the dominating passion of his life, and it developed at Oxford where he made the acquaintance of scientific friends and naturally went out in Natural Science, when he took his degree in 1878. Amongst others he had the privilege of the friendship of the late Sir Joseph Prestwich, in whose “Life and Letters by his Wife” we read:—“Another student with whom he kept in touch was the Rev. John Hawell, of Ingleby Vicarage, Northallerton, whom he encouraged to persevere in his work among the boulders of Yorkshire. About a year ago the writer of this memoir received a letter from Mr. Hawell saying ‘The one (letter) written to me when I was in the Radcliffe Infirmary suffering from an attack of diphtheria, to which I fell a victim while undergoing examination for the Burdett-Coutts Scholarship, particularly illustrates the kindness of his disposition, of which I have so vivid and reverent a recollection.’”

He was an indefatigable worker and never lost a moment, it is always more satisfactory to wear out than to rust out, and certainly Mr. Hawell far outdid his strength by physical and mental work, rarely going to bed before the early morning had come; arduously examining, cataloguing and arranging fossils, almost every evening of his life, when his day’s work was over; think for a moment of the work entailed by cataloguing 20,000 specimens. It was indeed the work of a laborious life. Very charming descriptions remain, fortunately, of a few of his geological and antiquarian excursions. Mr. Hawell’s favourite departments in the grand science of geology were “Paleontology” and “Glaciation.” Sad to say his career was cut short by a sudden and fatal illness just when his knowledge was ripening and he was becoming a power in the neighbourhood and the scientific world at large—his correspondence being very wide, extending especially over France, Germany, Italy, and other countries, and many were the letters and boxes of fossils which crossed the English Channel. “He did want to live a little longer” in a world which he found so very interesting and felt it very hard to be taken away just as his knowledge was bearing fruit. He was a type of the many thousands of cultured and learned men who have held the Livings in the Anglican Church for almost countless generations, men who were adapted for the positions which they held and into which they seemed to float in a most natural way. Unfortunately this cultured class is passing away to be replaced, as we fear, by mere seminarists; and great

will be the loss when scholars and real gentlemen have gone. English social life will be impoverished, religiously and parochially. A man without a hobby apart from his profession is generally an uninteresting and very often an unhappy man, but with some special object of relaxation life becomes better worth living and fuller every way. Such a man we have before us. In his own profession he was most diligent and his parishoners revered him for his work and sympathy, as a pastor, friend and helper in all the various vicissitudes, pleasures and sorrows of this mortal life.

Theologically he was abreast of the age and kept himself well informed in the highest of all studies, the relationship of God to man and man to God and to his fellow creatures. He was a powerful and thoughtful controversialist as the following letters to the "Yorkshire Post" (1904) prove. They were on the subject of "Religion and the masses."

A.
 SIR.—In your to-days issue "Interested" makes a most kind and courteous reference to my previous letter, for which I thank him. Let me, however, make a remark or two by way of answer to that part of his letter which is a reply to mine. He argues that the English branch of the Church of Christ "stultifies her former teaching of centuries" by extending the horizon of her outlook in accordance with the advance ever being made in human knowledge of nature and the Bible. He might with equal justice say that I stultify myself by holding, at forty-eight, views somewhat different from those which I held at eight. Unlike the Roman branch, the Church of England lies on no Procrustean bed, but keeps her intelligence open to all truth.

f.
 Verbal inspiration of Holy Scripture has never been the teaching of the Church of England, though she holds, of course, that "Holy Scripture containeth all things necessary unto salvation." In my capacity of President of the Cleveland Naturalists' Field Club, I am to take the chair in Middlesbrough to-morrow evening while my friend Professor Kendall delivers a lecture on "Early Man and his Relation to the Ice Age." I can assure your correspondent that I would not do this if I supposed that my friend's teachings would be at variance either with the teachings of the Bible which I revere, or of the Church which I love. That they may be inconsistent with the view which in days of weaker illumination the Church took of the meaning of certain passages of Scripture is another matter, and one which does not concern me as a twentieth century Churchman. It is possible that in the fuller light of to-day we may place a somewhat different explanation upon some of those passages of Holy Scripture which recount miraculous events from that which our forefathers placed upon them. That which appears miraculous to a child's intelligence sometimes divests itself of its miraculous semblance before the inspection of a full-grown man. Just as there was first of all an evolution of the Bible, so there has since been an evolution of its truth. That there has been an evolution on the part of the English branch of the Holy Universal Church of Christ I need not only refer to the events which took place in that period of her history usually known as the "Reformation" to show. But though the Church may give amended interpretations of certain passages of Scripture, she still recognises therein the presence of the supernatural.

My previous letter has brought me from unknown friends, whom I hereby heartily thank, two "religious" newspapers, one of them the organ of a militant section of Churchmen, the other the organ of a Nonconformist body. They are both inspired by a spirit of narrow intolerance, and have an outlook "cribbed, cabined and confined." Each is a most unlovely presentation of soi-disant "religion." If this is to be the kind of pabulum offered to a would-be religious public, little wonder if wide-awake thinkers, such as "Interested," are driven to find a religion outside the bounds of Christianity.

Meanwhile, we are penalised by an Education Act if we teach a definite Christian faith. We have to pay rates and taxes for the promulgation of a nerveless invertebrate creed, and to help to keep up the buildings and remunerate the secretary of the schools in which that creed is taught, and in addition we have to find the buildings in which the creed in which we believe—the old creed of the land, under the teaching of which it became great—may be taught, and we have to keep up those buildings, while the secretary has to give his work voluntarily. I saw a small bird to-day rest upon a twig seemingly enlarged to twice its size by adhering ice and snow. Down it came immediately. That twig reminded me of Board School religion. It has a seeming plausibility as a *modus vivendi* amid religious strife; but it is unsubstantial as a dream, and when the Christianity of the nation trusts to its sole support down it will come like the bird. Yet it is this form of religion which the unholy alliance of Nonconformists and non-Christians is striving so intently to make universal.

In a second letter—

SIR,—I would crave permission to occupy a few lines of your valuable space in order to say a word or two by way of comment upon the letters of Mr. Goodyear and "Interested," which appear in your issue of this morning. Mr. Goodyear thinks it would be better for ourselves and for the Church if we clergy would recognise that there are very many Board school teachers doing their utmost to raise the religious and moral tone of the children committed to their charge. We do recognise this with keen gratitude, but we recognise also with keenest pain that there is no guarantee that a Board school teacher will be a Christian, and that there are many such teachers who occupy the position of "Interested" outside the bounds of Christianity, while still others hold no religious beliefs whatsoever.

In my boyhood I once had as a master an agnostic—an excellent teacher of the Bible, but who gave us plainly to understand that he did not believe in a great deal of it. I could fill much space in dealing with the disastrous influence of his teaching upon others. In my own case his teaching, and especially the private talks I had with him, led me to make full and earnest inquiry into the foundations on which my faith rested, with the result of establishing that faith on an infinitely firmer basis.

More than 20 years ago I took honours in science at Oxford, and since then my knowledge of science has progressed side by side with my knowledge of Christianity and Church doctrine, and as my outlook has extended I have found these two departments of knowledge more and more in accord. "Interested" asserts that "modern thought and science have destroyed the dogmas of the Christian Church." Not so. We may have a clearer and therefore somewhat differently appearing view of the nature of Biblical inspiration and many other things, but the evolution of the scheme of Salvation which is by Christ is as much in accord with all that science teaches as is that of the evolution of a planet, or the life upon it. The

establishment of a Church or Society for the salvation of men with a definite method of admission thereinto, is as understandable on scientific lines as is the formation of a vine for the elaboration of grapes through a series of definite processes. It is the indefinite un-dogmatic Christianity abroad among us, due, I think, it cannot be unfair to say, to the teaching given in Board schools rather than in Denominational schools, that is leading the masses into weakness of belief in Christianity, or on into the non-belief of such persons as "Interested," whose hearts still feel after a religion of some kind.

The recently passed Education Act was very unfair to the Church, but I hope that the clergy, at least, are too busy to either actively or passively resist it. Rather let us make the best of it, and give sound Christian and Church teaching in our denominational schools, so that the youth trained in them may be a leavening of the masses growing up with inadequate conception of the Christian system, and likely to give origin in the next generation to a people divorced from Christ. From which fate may God and the Church defend our fatherland!—Yours, etc.,

JOHN HAWELL.

Ingleby Greenhow Vicarage,
Middlesbrough, Nov. 27th.

Mr. Hawell had the literary gift of facile writing and in his descriptions of scenery, history, geology, and folk lore he carried the reader pleasantly along, instructing and entertaining him at the same time; sometimes one is reminded of Charles Kingsley, in fact in many respects Mr. Hawell was a similar character, and with both, their relaxations were science and hard work. They both took a broad and wide view of Religion and its Power, of human affairs, and the cause of history, and the progress of humanity as a whole. Had he lived a few years longer we might have looked forward to another delightful book rivalling in interest the well-read, "Forty years in a Moorland Parish," by the late Canon Atkinson, but it would probably have been named "A Quarter of a Century in a Cleveland Parish." Nothing came amiss to him in the Scientific, Theological and Antiquarian World, a stone by the roadside or a field name equally interested him—and as to this old globe, his thoughts ever turned. "The face of the earth was to him," (as to another geologist recently deceased). "The face of a great angel, with infinite smiles and anguish-lines and profound sympathies with peace and suffering stamped upon its features. Every lineament a line of tragical history, full of pathos and sublimity."

But, with deep contemplation of the long history of the earth, and all that its marks and furrows teach the graveyard for millions of years of countless organisms, ever progressing in type and form, until at last the genus homo was reached; he gazed into the remote past and lived in the present a very real life of enjoyment, and we doubt not he would fully have entered into the sentiment of the late Sir E. Burne-Jones whose life was centred

on his art, which he loved so well, and enriched so much, when on the very day of his death he said "I should like to paint and paint for seventeen thousand years." And like this great artist Mr. Hawell had a keen sense of the ridiculous and a fund of humour; no one enjoyed a joke more than he did,

Mr. Hawell went up to London to be present at Burlington House on the occasion when Mr. P. F. Kendall read his remarkable paper on "a system of glacier-lakes in the Cleveland Hills," January 8th, 1902. In the discussion, Mr. Hawell said "that he had accompanied the author in very many of his excursions in the Cleveland districts; he had wandered with him through his dry valleys, and assisted him through his boring operations. However convincing the author's excellent presentation of his conclusions and the evidence on which they were based had been, the evidence in the field were still more strikingly so. He had himself, resided in the district for the last 22 years, and during nearly the whole of that time had paid special attention to its glacial geology; but very many of the problems which presented themselves were insoluble, until the author came down and threw a flood of light upon them. He regarded the reading of this paper as making an extremely important advance in our knowledge of glacial geology."

With regard to the boring operations here alluded to Mr. Hawell used to relate how he amused the Fellows with his ludicrous description of what happened on one particular boring day in the peat of Bilsdale. Mr. Kendall had put down one or two seven foot rods when all at once the rods went down suddenly and Mr. Kendall sprawled on his nose, in fact he went down, down, down, and just as he was disappearing Mr. Hawell pulled him out by his boot-lace! A Cleveland vicar who knew him well writes that a year before his death Mr. Hawell took from his pocket one day a fossil which he had just received from the Cambridge Professor, he asked him how long ago it was since these fossils were living organisms? He paused, ruminated, and then said, "Fifty million years." A well-known Irish gentleman who was present nearly jumped out of his seat "Och, sure, let's talk about something practical! I've got a man who won't pay his rent, tell me how to get rid of him." Mr. Hawell enjoyed the joke thoroughly, as we know he would. He was a good guide and little escaped his keen eye; he was certainly not like another well-known geologist, the late W. T. Aveline, whose silent demeanour passed in a proverb. "In the morning as he passed a crag of rock, he tapped it with his hammer, and remarked "grits." In the evening on the way homewards he

had to chip another block, and again broke silence with "more grits." Not so our old friend who was full of grit and "wise saws and modern instances." To the Vicar of Marske he wrote in 1902 on the subject of Field names and other matters. "I am glad to hear you are working out, in conjunction with such an able antiquary as Mr. Fallow matters connected with the history of your parish, I am especially pleased to hear that you are taking up the question of old field-names. I have copied all the field-names in this parish, and I am not without hope of getting the same thing done in most of the parishes of Cleveland, I found, as you are apparently doing, that the investigation threw much light on the old open field system. I am able to trace the boundaries of the old open-fields to a considerable extent. In the Spring and Summer I must try to get you to spare me an hour or two some fine afternoon to walk through your parish paying attention to some of these matters. I do not think I have any special knowledge regarding indications of the "glacial period, etc., in the Parish of Marske. I think there are some remains of peat or forest bed between Marske and Redcar but, nearer to the latter, somewhere near the rifle butts, I think. Some years ago Mr. J. M. Meek brought for my inspection some plant remains which he had obtained from the Estuarine Beds of the Lower Oolites, if I remember rightly, somewhere above New Marske. I think he said there was a footpath up the hill close to the place where he obtained them. I should like to visit that spot sometime if I could localise it. Perhaps you may know it. I am not *sure* that it was near New Marske. The Geological Survey Memoir on "North Cleveland" says "about a mile west of Marske and opposite Red Howls is an exposure of 'shale with hard bands,' which can only be seen under favourable circumstances, as it is so often sand covered. Messrs Tate and Blake give *Ammonites Semicostatus* and *Ammonites bisulcatus*, from these beds, and refer them to the zone of *Ammonites Bucklandi*. Mr. Geo. Barrow, the Geological Survey Officer, who surveyed the N. Cleveland District, made four visits to the spot without being able to see this outcrop. As you are on the spot, you have a good chance of catching it in an unclothed condition, and if you could get some of its fossils they might prove interesting—of course there is plenty of glacial drift in your parish."

In another letter "of course I have long known that there was a buried forest at Redcar, but I have never given any very special attention to the matter, and have hardly had it before my mind for years at least. I do not remember having heard what you say about it, and an account written by an eye witness

would be highly interesting to me, but I should be sorry to give you any trouble in obtaining it for me. An old man living at South Bank recently sent me a most interesting account of his experiences in 1840, when the artificial lakes at Kildale burst and deluged the country about Great Ayton and Stokesley. I am fond of obtaining bits of information respecting the past history of Cleveland."

Conchology also interested him and in 1897 he wrote to Mr. Thomas:—"I fear I have no report to make this time on behalf of the Conchological Committee. My own collection of British Land and Fresh Water Shells being practically complete, such natural history exploration as I have done has been almost entirely in other departments. I made a few records of marine mollusca on the coast, but they are not worth making a special report of. I spent most of the month of June last in the Crag District of Suffolk and brought back material out of which I have since worked out over 300 species of fossils, and over 12,000 specimens. The sorting and determination of these has absorbed very many of the fragments of time which I have been able to spare for Natural History pursuits. I have obtained a fair number of fossils from the Yorkshire lias during the year, but nothing worthy of special mention. A slab of Ichthyosaurian remains from the zone of *Ammonites Serpentinus* at Port Mulgrave, and a specimen or two of the crustacean *Pseudoglyphæa Etaleni* from a nodule in the zone of *Ammonites communis* at Boulby old Alum Works, are the most interesting Liassic finds that I can call to mind. These were both obtained during the visit of the Yorkshire Geological Society to the coast in the autumn. During that excursion two very notable finds were made at Saltwick Nab, a little outside the Cleveland boundary. Two species of gastropoda obtained by Mrs. Kendall from the zone of *Ammonites Serpentinus* at that point are new to the Yorkshire Lias, and I think, new to science. These I described in a paper read at the Annual Meeting of the Yorkshire Geological Society at Wakefield, in October, under the name of *Turbo Saltwickensis* and *Actæonina Kendallii*. The paper is being printed with an illustrative plate, of which I enclose you a first proof, not quite accurate, in the Annual Proceedings of the Yorkshire Geological Society.

I have in preparation a paper dealing with the Conchology of Cleveland, Land, Fresh-Water and Marine, but it will be some-time I fear, before it is sufficiently complete for publication. The Cleveland Club will probably not be able to afford to print its proceedings every year, and if there is not much material

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ready for this year, I would suggest that we might delay further publication until next year. By that time I could probably have my paper ready, or at least either the Marine, or Land and Fresh-Water section of it, if it were considered to be worth including in the Proceedings of the Field Club.

With a view to a better investigation of the Marine Shells and other organisms of the Cleveland Coast I would suggest that the Field Club should endeavour to arrange for a dredging excursion in Tees-mouth during the coming summer."

To Mr. Lofthouse he wrote in 1903. "I have been up to Rudd Scar this morning, taking a hammer with me, but though I did my best I was altogether unable to expose a single bit of *Equisetitis in situ*. I found, however, a very interesting deposit of "dogger," where no "dogger" has been supposed to exist. I do not know what it would be best to suggest that you should do when you come out here with the Field Club. I could show you the big oak in Greenhow. It struck me to-day that there is a bit of ground that would well repay working right up in the corner of Greenhow Bottom. It is a secluded place and there are some bits of boggy ground. On a fine, mild day I should think you might do well at insects up there. There were plenty of butterflies out to-day. Energetic members of the Club might like to climb the bank above which would bring them on to Botton Head, the highest point of Eastern Yorkshire, where the Ordnance Survey had a station for some time. The summit is crowned by a large tumulus of the date of the "Bronze Age." To the writer he remarked in a letter, July 20th, 1901, on place-names."

"Speaking of the way in which the names of villages grew to be surnames of the people hailing from them, the group of surnames dependent upon your village of Heathwaite as occurring in the Stokesley Register is not without interest. The spellings are Heathwaite, Heathwait, Heathwhaite, Heathwood, Heathwode, Heuthwaite, Hewthwaite, Hewtherd. Hathwait, Hathwhaitt, Hathwhitt, Huthert, Hutherd, Huther, Howther. The evolution of surnames is one of the thousand matters of interest upon which the publication of Parish Registers throws helpful light. Indeed there is absolutely no other means so far as I know or can guess of tracing the origin of such a name as Huthert."

We have here another letter on place names :—

THE PLACE-NAME "WETWANG."

To the Editor of *The Yorkshire Post*.

SIR,—I am not concerned in the least to defend the derivation of the name Wetwang, the possibility of which I queried in your issue of the 29th ult. The possibility of such an origin only occurred to me at the moment of writing. We must be allowed the pleasure of guessing sometimes at "what's in a name, for though in my last letter I sufficiently indicated the futility of such guessing, especially where local knowledge is wanting, a name-origin cannot always be "worked out." I certainly think that Mr. Cole's theory regarding the origin of the name of his parish is the best yet advanced.

I must, however, take exception to Mr. Cole's statement that "wheat was not grown on the Wolds till the present century." It is true that I cannot at this moment definitely prove that it was, but I have no doubt that such proof could be readily obtained. Flour was a common form of rent paid to monasteries, &c., in mediæval times, and the mediæval open arable field system has been traced back to the pre-Conquest period. Under the Romans Britain was a great corn-growing country, and *Wetwang* was near one of the Roman roads. Though the wheat taken from the Egyptian mummy cases may have got into the cases subsequently to the mummies themselves, it has been known long enough, and was as familiar to the Hebrew Psalmist as it is to ourselves. Very possibly when the reindeer roamed the Wolds, and the inhabitants thereof used his horns in preparing the ground for crops, one of those crops was a wheat crop. The land which was too light for growing wheat in 1735 would not be too strong for those rude implements. Upon its first cultivation the land would be much stronger than it is now, and the soil would contain much more organic matter. The land might be unsuitable for growing wheat last century partly, at least, because much wheat had been grown there in previous centuries.

Regarding the name Wetlands, Canon Atkinson writes to me :—"There are two places in this parish (Danby) which were distinguished by that name from about the year 1200 as I know, how much before I can't say. One of them is still called Wedlands or Wetlands Head. Besides I know of the occurrence of the same name in, I suppose, a dozen, (maybe twenty) other cases, all going back to from the thirteenth to the fifteenth century, and to be met with in almost as many Cleveland townships. It is one of the commonest old open-field system names. The oldest form I have is 'hvedelandes.'"

In my previous letter there were two misprints. "Kearsley Gath" should have been "Kearsley Garth," and "Thiep Close" should have been "Threp Close." Compare "Threpdwa" in the Rievaulx Cartulary.—

Yours truly, JOHN HAWELL.

Ingleby Greenhow Vicarage, Middlesbrough,
December 3, 1897.

On finding a rare and simple little white flower on the moors at Scugdale on a lovely day in June, 1901, Mr. Hawell wrote :—"The white flower we met with while descending from the moor yesterday was *Trientalis europæa* L., the Chickweed Winter-Green."

Hooker says of its habitat "Subalpine Woods from York northwards, rare and local." "Absent from Ireland." I have never previously met with it to my knowledge.

In October, 1901, he kindly sent a photograph of the Bilsdale Founder's Stone with a copy of the inscription which, however, could not be reproduced as no type of the kind, we believe, is in existence; however it reads "Condit ecclesiam Willelmus nobilis istam intemeratæ nomine sanctæ virginis Hilda." The noble William builds this church in the name of the chaste holy virgin Hilda. This stone of dedication is well-known to antiquaries, and is decidedly worth a visit.

Regarding flint instruments he wrote in 1901 "thank you for forwarding to me Mr. Auberon Herbert's letter to the *Standard*. It was mentioned to me recently that Mr. Herbert had been contributing to the *Times* some account of his finds of flint implements (or flints which he supposes to be implements). I forget what his contention is, although I think it was mentioned to me. I think he holds that his flints are the work of either men or apes. The Geologists' Association evidently holds the chipping is due to the action of frost. I remember once walking down the slopes of Shotover Hill, near Oxford, with Professor Prestwich and his geological party. A member of the party submitted to him a flint from which bits had been flaked off. He pronounced it to be a case of frost-flaking. A member asked him whether many of the so-called implements might not be the work of frost. He answered *to that extent* frost might simulate an implement, but an expert is usually able to pronounce as to whether a flake has been struck off by an implement or is due to frost-bite." Mr. Auberon Herbert evidently thinks he knows better than the experts. Possibly he does. Let us hope it may be so. Let him find a few skulls of his apes in his gravel pits and even the Geologists' Association will listen to him. If I obtain more information about these matters I will write to you."

On the Boulder Question he wrote to us in 1903. "I was at Horton-in-Ribblesdale last week with the Yorkshire Geological Society, and took with me the interesting boulder specimen which I brought away from your cabinet. Kendall did not turn up, but I submitted it to two good petrologists. Dwerryhouse, Kendall's assistant at the Yorkshire College, and J. H. Howarth, the Secretary of the Boulder Committee of the Yorkshire Nats. Union. and neither of them remembered to have seen anything like it. Howarth begged to take it away with him for further study, and to submit it to other petrologists at the next meeting of the Boulder Committee. He would much like, I think, to place it in the collection of Yorkshire erratics, but will return it

to you if you wish. I hope you may be able to find more specimens of it. The large white orthoclasses are very conspicuous."

In the introduction to the "Ingleby Greenhow Register," he says, in speaking of Glacial Boulders "we have measured and taken notes of some hundreds occurring within the limits of the parish. A collection made by us of specimens of different varieties has been examined by Professor Bonney, and by Mr. C. T. Clough, of the Geological Survey, as well as by ourselves. These specimens afford evidence of a stream of erratics flowing into our locality from the South of Scotland, and from the Lake District of Cumberland and Westmoreland. Local rocks, such as the sandstones of the Inferior Oolite, and blocks, of Augite-andesite from the Cleveland Whinstone Dyke are, of course, numerous. Next to these in point of number come Porphyrites from the Lower Old Red District of the Cheviot Hills. The varieties also include Shap Granite, Criffel Granite, Syenite, Dolorite, Greenstones from Borrowdale, Volcanic Ash from Cheviots, Porphyritic Felsite, Igneous Felstone, Igneous Rock probably from near Loch Lomond, Old Red Trap, supposed to be from near Kelso, Porphyritic Basalt from Carter Fell, Whinsill from Upper Teesdale, Quartzite Greywacke, Hällefinta, Mudstone, Coniston Flagstone, Carboniferous Limestone, Carboniferous Sandstone, Magnesian Limestone, Old Red Conglomerate, Millstone Grit, Vein Quartz, (See Fifteenth and Sixteenth Reports of the British Association Committee for recording the position, etc., of the Erratic Blocks of England, Wales and Ireland). On one occasion Mr. Hawell found Asbestos in the Whin Sill at Great Ayton. In 1903 he wrote a most interesting letter on the Sun and Glaciation. "Thank you so much for the cutting from the *Standard*." I think that if it is possible to suppose that the sun may be a variable star we have the very simplest of explanations of the cause of glacial epochs. All the other explanations have presented difficulties to me, and it has been the fashion in the past for geologists to assume that the sun has gradually cooled. Still Astronomers, and even geologists have not been altogether unmindful of the possibility of there being some variability. I find, for example, in Geikie's Text Book of Geology (Edition 1883) a quotation from Prof. Tait in which he suggested that "the former greater heat of the sun may have raised such vast clouds of absorbing vapour round that luminary as to prevent the effective amount of radiation of heat to the earth's surface from being greater than at present." A similar cause may, I think have made it even much less. But I do not remember to

have seen the matter discussed by any physicist, astronomer or glacialist. Thank you for calling my attention to the fossil tree on Carlton Bank, as I am especially interested just now in the Lower Oolitic Vegetation. I will try to get over there some day soon. And so he did on January 4th last year, when we met in the quarry and found the tree had unfortunately been covered up with debris, however, we saw parts of other fossil trees which are fairly common. This was one of the last scientific walks he took and not long after he began to feel unwell little thinking how soon alas he would see no more of this world's structure!

Geologists sometimes meet with amusing incidents, Hawell used to relate with great glee, an encounter he and a geological party once had with a crusty old farmer on the Yorkshire Coast; they were passing through a field when up came the farmer to turn them out for trespassing, he was very rough and in any but an amiable mood, as he ordered them away. "We are a peaceful party" urged Mr. Hawell, "we have simply come to look at the rocks and examine the stones and we shall not do any damage," however, this polite remonstrance had little effect. Mr. Hawell in his turn, became rather annoyed at the man's uncouth manner and remarked "why, you might think we were a party of fools." "I dunno but what ye are!" was the answer, and then the party went on rejoicing and merry at the compliment which had been paid them. With this anecdote we may fairly include one or two extracts from Sir Archibald Geikie's "Scotch Reminiscences."

Some capital stories illustrating at once Scotch caution and Scotch rural simplicity are told in connection with the author's geologising experiences. It was often a great puzzle to the countryside why he should spend his time chipping off pieces of the "stones" of old Scotland to carry away in a bag.

A member of the Geological Survey, whose daily avocation consists in such pursuits, is, of course, specially liable to become the victim of curiosities and suspicion. He finds himself set down now for a postman, now for a doctor, for a farmer, a cattle-dealer, a travelling showman, a country gentleman, a gamekeeper, a poacher, an itinerant lecturer, a ganger, a clergyman, a play-actor.

If he happens to be chatty with strangers he may find himself put down for something else as well. Writes Sir Archibald:—

I was dining with an old friend, the late Mr. Cathcart of Knockdolian, who told me he was quite sure I must have been recently in his neighbourhood. "Only yesterday," he said, "I met the old farmer of G—, who had a strange tale to tell me. 'Dod! Mr. Cairthcart,' he began, 'I ran across the queerest body the ither day. As I was comin' by the head o' the cleugh I thoct I heard a wheen tinkers quarrellin', but when I lookit doon there was jist ae wee stoot man. Whiles he was chappin' the rocks wi' a hammer, whiles he was writin' in a book, whiles fetchin' wi' the thorns, and miscain'

them for a' that was bad. When he came up frae the burn, him and me had a long confab, Dod! he tell't me a' about the stanes, and hoo they showed that Scotland was ance like Greenland, smooed in ice. A very enterteenin' body, Mr. Caitheart, but—an awfu' leear.' "

And now, having used up the very scanty materials—all we could obtain—relating to a very interesting and noble life, devoted to the service of God and the study of nature, we end our very imperfect sketch of the late "guide, philosopher, and friend" of our Club. We take leave of one who was, in the words of a scholarly man—a Cleveland Rector—"head and shoulders above the rest of us." He was indeed a loss to the whole neighbourhood and like poor Clifton Ward, (a Vicar in Mr. Hawell's own Country some 20 years ago, the brilliant Geologist of the Lake District,) he has been greatly lamented; both died long before their natural course was run.

Whatever may be said about the so-called conflict between Theology and Science, it in no way applies to Geology. Theology is not religion but the philosophy of religion, and may from time to time require to be modified as the human mind can grasp more and more of the Divine idea; like science it is inclined to be over-dogmatic at times. Science is by no means free from this defect; forgetful that "nothing continueth in one stay," in this World, even in its domains; over and over again science has been obliged to retract her position. Only a few years ago we were told we must believe in some 70 elements, all of which were atomic, but now "Radium" has suddenly come to light, and dispersed the "mighty atom," which is no longer an atom at all!

With this the Geologist has no complaint to make, he was satisfied with some 16 of the so-called elements as entering into the composition of the outer part of the globe, but he did sometimes complain when Lord Kelvin only allowed him 100,000,000 of years "unless (as he said) some new source of energy were discovered." That source of energy has now been found and he can have as many millions of years as he requires, and so he is content and happy.

The Church has always been intimately connected with the study of Geology: Past Presidents of the Geological Society having amongst them the great names of Buckland, Adam Sedgwick, and Whewell. Professor Bonney, another one being still alive, and one of the foremost Geologists of the day. Many Clerical Fellows and others have done, and are doing much to promote the study of this grand science.

“The Naturalist” for August, 1904, gives an obituary notice in which it says “The news of the recent death of the Rev. John Hawell, at the comparatively early age of 49, will come as a sad surprise to all naturalists throughout the country, so many of whom were his personal friends. Yorkshiremen will particularly mourn his loss, whilst his own parishioners of Ingleby Greenhow have lost a Vicar to whom they looked for advice and help during the last 24 years.

To the Yorkshire Naturalists Union Mr. Hawell was of great assistance, and his place will be exceedingly difficult to fill. He was President of the Geological Section, Divisional Secretary for N.E. Yorks, and served on several committees. Whatever he undertook to do he did promptly and well. The excursions which he organised in his district were always most successful.

He was largely instrumental in bringing the Cleveland Naturalists' Field Club into its present flourishing condition. Of this Society he was President in 1891, 1895-6, and 1903-4. Under his editorship the Cleveland Club has issued valuable Annual Proceedings since 1895, which contain contributions to the natural history, &c., of the Cleveland area. In these Proceedings Mr. Hawell himself published papers dealing with Mollusca, Geology, Physiography, &c., of N.E. Yorks. The Yorkshire Geological Society is also indebted to him for papers on geology and palæontology. Under the latter head special mention might be made of his ‘Description of Two New Species of Gasteropoda from the Upper Lias of Yorkshire’ (1897).

To ‘The Naturalist’ Mr. Hawell was a frequent contributor and so recently as August last a paper appeared from his pen dealing with the plant remains which he had found in the Oolitic beds of North Cleveland. In this paper he gave an account of the last piece of scientific work he was permitted to accomplish, his subsequent illness preventing him pursuing a work which to him was a pleasure and to science a profit. In addition to the natural sciences Mr. Hawell was well acquainted with the antiquities, folk-lore, &c., of his neighbourhood.”

Our thanks are due to the Editor of the “*Naturalist*” for kind permission to use the block from which the portrait has been printed, also to Mr. Baker Hudson, Curator of the Middlesbrough Free Library, for the extract from Mr. Hawell’s Will which we have appended, so far as it relates to the Dorman Memorial Museum.

March, 1905.

J. C. FOWLER.

ABSTRACT FROM A LETTER RECEIVED FROM THE SOLICITORS
OF THE LATE REV. JOHN HAWELL.

"I bequeath to my friends Thomas Ashton Lofthouse, of 62, Albert Road, Middlesbrough, aforesaid, Esquire, William Young Veitell, of The Crescent, Middlesbrough, aforesaid, L.R.C.P. Edinburgh, F.G.S. London, Thomas F. Ward, of Parkfield Road South, Middlesbrough, aforesaid, Esquire, and James Matthew Meek, of 10, Nelson Terrace, Redcar, in the County of York, aforesaid, Esquire, my collection of fossils, rocks, minerals, and shells, with the request and in the confidence that they will deposit the same in some institution for the benefit of the people of Middlesbrough, it being my desire that they should if possible deal with the same so that the Cleveland Naturalists' Field Club and the New Museum at Middlesbrough may benefit by this bequest. I also bequeath to them such of the books in my library bearing on the subjects of Geology and Conchology as they may select to be deposited at the same place as they may select for my collections of fossils, rocks, minerals and shells. And I desire my said friends after this expression of my wishes to exercise their uncontrolled discretion as to the disposal of my said collection of fossils, rocks, minerals and shells, and of the books from my library bearing on the study of these branches of science, and I declare that the above expression of my wishes as to the disposal of the said articles and effects shall not create any trust or legal obligation.

Referring to the bequest of books, Mrs. Hawell desires us to inform you that the before-named gentlemen are at liberty to take *all* deceased's books on geological and conchological subjects, while Mrs. Hawell herself desires to give all other her late husband's books on scientific subjects to the Middlesbrough Museum Authorities."



THE HISTORY OF EASBY.

BY THE LATE REV. J. HAWELL, M.A., F.G.S.

Extracted from "*The Stokesley and Ingleby Parish Magazine,*"
1901-1903, by J.C.F.

When I think of Easby I think not only of the Church and the Hall, the village and the farms, but I think of the stream and the hill and the solid rock which forms the foundation of all. And in considering where I ought to begin in putting down a few notes regarding Easby my thoughts naturally turn to that which lies at the foundation—that which existed first. One might go back a long way in tracing its origin. It is perhaps enough to go back a few millions of years to the time when the rock over which the Leven flows at Easby was being formed. The waters of a sea then covered the site at Easby, a sea peopled by all sorts of creatures. There was the big ichthyosaurus—a fish lizard some 40 feet in length, not unlike those beasts depicted on the pillar in Ingleby Church next to the West of the lotus-pillar.

I have never found his remains at Easby, but I have got a bit of his tail in Baisdale out of beds of about the same age, and on the Coast at Staithes, I have found his ribs and paddles and spinal column; so I know he was on the prowl in the neighbourhood, seeking what he might devour—especially, perhaps the Ammonite. I have found beautiful little Ammonites at Easby, and I dare say that old Saurian reptile did the same, and enjoyed getting there quite as much, a long time ago; munching a mouthful, measuring from one to six inches in diameter. I have no absolute proof that this old scavenger of the ocean loved this particular diet, but I know he liked fishes for I have seen their scales still existing in his fossilised paunch, and a school inspector once told the Ingleby school-children that a lobster was a fish, and therefore I see not why we should not call the Ammonite a fish. Besides the Ichthyosaurus may have been no more intelligent than a school inspector, and may not have drawn a clear distinction between two classes of animal life, especially if he happened to be hungry. Now the Ammonite was a sort of sea-snail akin to the pearly nautilus and his shell was a beautiful spiral which reminded the men who gave him his name of the horns of Jupiter Ammon. At Whitby they call this shell



Block kindly lent by Mr. J. W. Brotton.

EASBY CHURCH.



a snake, and they tell how St. Hilda charmed off all the heads of the snakes which were a great nuisance there when she founded the Abbey. The sea at Easby at this date was moderately deep. There was a shore some way to the North West and through a wooded land a large river brought trunks of trees which became water-logged and sank and formed the origin of what is now jet. At a later time, the site of what is now Easby was near to a shore, nay at length was dry land or land that was far from dry. At one period—about the time when the sandstone now forming the cap of Roseberry was being deposited—horsetails thick as a man's arm grew in the neighbouring marshes and are at this moment to be seen still in the upright position in which they grew. Then down went Easby beneath perhaps 2,000 yards perpendicular of rock and a deep ocean on the top of that. An intelligent person seated on the summit of Roseberry on a bright summer's day, and opening his eyes as an intelligent person may be expected to do, cannot well fail to see that he is sitting on a bed of sandstone which shows current bedding and other evidences that it has been laid down in somewhat shallow water, and that the bed is continued round the hill on which Captain Cook's monument stands, and round Greenhow Botton and Hasty Bank, standing out very prominently at the Wainstones; and it must be evident to his assumed intelligence that the bed must once have been continuous from where he sits right up into Botton and right across to the Wainstones. And if he will reflect, as an intelligent person may be expected to do, he will conclude that the washing out of the material which once filled the Ingleby corner up to the level of the hill tops was a work which must have kept Dame Nature's old scrubbing brush in employ for many a long day, and that there is not a little "history" involved in the operation. But ages intervened before Madame Nature's old scrubbing brush got a start upon that particular little bit of work.

Let our intelligent person pay a visit to the Yorkshire Wolds, and he will find thick chalk deposits which were evidently laid down in a deep sea. Where was the shore of that sea? It is difficult to imagine that it could be anywhere between the Wolds and the Pennines. Therefore it is likely that the chalk, or deposits of that age—an age which alone must have extended through millions of years, for the chalk is largely composed of very minute organisms which lived on the surface of the sea and dropped to the bottom when they died—must once have extended over the Cleveland hills and moors, and that at that date the present site of Easby was thousands of feet below the surface of the sea.

Burns tells us how John Barleycorn was buried—how “they took a plough and ploughed him down, put clods upon his head, but in spite of everything, John Barleycorn got up again and sore surprised them all.” But wonderful as the resurrection of a grain of barley must be admitted to be, the rising again of the site of Easby into the light of the sun is almost more notable.

After the time at which the chalk was deposited there are many missing chapters in the history of the neighbourhood of Easby, and though much might be inferred, we will pass on rapidly towards the present epoch. The land is rising from the sea—probably by the most gradual stages, since He with whom a thousand years are as one day never needs to hurry—must have suffered very serious waste. Possibly at more than one age this battling with the waves had to be carried through. And when the land had risen well out of the wild waters it was still liable to be acted upon by water in the shape of rain and running streams not to speak of the disintegrating action of frost and other atmospheric agencies. So some 100,000, or it may be 50,000 years ago the neighbourhood came to have pretty much the same general configuration as now. Then for some reason or other a period of intense cold set in. Some say the North Pole changed its position. Some say the Solar System passed through an intensely cold portion of space. Some say that instead of the Gulf Stream which now wraps our islands as in a blanket, we had frigid currents from the North. Be that as it may there was continuous ice from the Scandinavia to the Yorkshire Coast. Ice rivers from Scotland and Cumberland flowed down to Easby bringing with them, Scotch and Cumbrian rocks which even to-day you may pick up in every field in the township.

The intelligent person I have before imagined—and such persons are not altogether imaginary—would naturally enquire the reason why the river Leven hugs so closely the Easby hills from Kildale round to Easby. The explanation is interesting. I spoke before of the glacier which flowed from Scandinavia in volumes so huge that it infringed on the Yorkshire Coast. It pressed inland as far as about where Lealholme now is, and was of such thickness that it blocked the end of Eskdale and formed a lake therein. I have traced many channels formed by the water which ran into and out of this lake, which I know to have been so deep that there must have been an ice block at the Easby end of Eskdale too. This ice we will take to have come mainly from Teesdale, though there were, as the period went on,

fluctuations of an interesting character, and which are so far somewhat obscure to the scientists investigating them. Eskdale, then, had an ice block at each end—the ice being possibly about 1,000 feet in thickness, or perhaps considerably more. As a rule the water from the Guisbrough side flowed into the Eskdale lake, and the outlets were in the direction of Goathland. But, I have recently discovered that there was almost certainly an overflow at one time from the Eskdale lake into Sowerdale—the dale between the Roman “Castle,” at Easby and Captain Cook’s monument. Anyone looking at Sowerdale will be able to see that the denudation of it cannot well have been entirely due to the insignificant stream which now percolates through it.

I have before described how at one time at least during what is known as the “Glacial Period” or the “Great Ice Age,” a great barrier of ice blocked the Ingleby end of Eskdale, so that the water of the Eskdale lake flowed over into Sowerdale and helped to form that dale. Somewhat later this water was able to flow out at a lower level between the ice-mass and what is now Easby Castle Hill. As the ice gradually shrunk the out-flow came to be at a progressively low level, but still hugged the Castle Hill, clearing away from the slopes of that hill as it gradually descended, the drift material which had accumulated there. And so when the ice had quite gone the Leven had cut its channel close under the hill instead of flowing out in the direction of Battersby Junction, as it probably did before the ice age, and as it might be expected to do under circumstances of normal denudation.

There is a world of interest involved in the tracing of pre-glacial river courses. We find, for example, that the Swale was once a tributary of the Tees, but I cannot stop at present to tell the tale how it was captured by “the all-devouring Humber.” It concerns us more to notice at present that the stream flowing down the upper part of Kildale is aiming directly for the Esk. Why does it all of a sudden change its mind and twist round to the Tees? That it went into the Esk once there can be no doubt. This query is probably connected with another which was put to me one day at dinner by a distinguished geologist who sat next to me; whether did the Scandinavian ice or the Teesdale ice retreat first from the Cleveland Coast? Of course, the Scandinavian ice was the larger mass, but it was further from home. So my friend’s query cannot be answered *a priori* grounds. To answer it one must go into the field and use one’s eyes as well as one’s reasoning powers. I think that it is possible

that in the twists of Kildale Beck, and in the undercliff position of Easby Beck, we have very important evidence tending to a solution of my friend's problem, which by the way, I had tried to solve before he put it to me. If the Teesdale ice blocking the Ingleby end of Eskdale, retreated first, the water of the Eskdale lake would flow out at the Ingleby end cutting a channel under Easby Castle Hill; cutting also a channel in the same direction for the upper part of the Kildale Beck. Therefore, at the end of that mighty warfare of ice-masses which was fought out in the region of the Tees mouth and the Cleveland Coast in the days of long ago, the big mass although further from home, gained the final victory. This ancient history is repeating itself now in South Africa.

It is difficult for us to picture to ourselves the state of the land surface as it existed around Easby when the war of the ice-masses was over, and the glaciers had gradually retreated towards the Scandinavian Peninsula, and the Scotch and Lake Country Mountains. The Ingleby corner proved a veritable *cul-de-sac* for the Teesdale ice-streams especially. How did we get the wide embayment running up into Botton, so different from the valleys of natural denudation such as we find them where atmospheric forces had the same rocks to deal with in Bilsdale, Bransdale, and Farndale? In my judgment the present form of the Ingleby Valley is largely due to causes which operated during the glacial epoch. The ice came into our corner and found itself opposed by the barrier of the hills. It knew not where to turn, and as it twisted this way and that way, its mighty and aiding force was exerted upon the rock, much of it of a soft character, which formed the lower portion of the hill-slopes. Then again when the ice-age was coming to an end, and the glaciers to leave our locality, there would be I think a mighty swirl of waters derived partly from the melting ice sweeping round between the hills and the still remaining ice, washing away the rock fragments rubbed off by the ice, and having removed the "scree" eating into the solid rock and removing that too, until the superincumbent rock, weakened and undermined, fell with a plashy thud into the mordent waters, which still swirled on, reducing all solid matter into the form of sand and gravel, and the slips and the sand-beds are there until this day. Of course, it is not likely that the ice took a sudden departure like that of a man who has robbed a bank. I have just been explaining how it had robbed the Ingleby bank, but for all that I think the leave-taking was more like that of a lover saying farewell to his sweetheart, with sundry returnings before he gets fairly on his homeward road.

The ice which had melted back a bit in the Summer advanced again in the Winter. The retreat caused by a few mild seasons may have been counterbalanced by a few succeeding severe ones. I should not be surprised if it took the ice a century or two to say farewell. There is evidence all around us relating to these matters, but the reading of it is a task of peculiar difficulty. But, at length the ice moved off, and must have left the surface of our neighbourhood in a dirty mess. The surfaces of our higher moors were not ploughed by ice rivers, but much ice and snow must have collected on them, and it is doubtful whether there would be much vegetation clothing them when the ice-age came to an end. The lowland tract would consist of muddy expanses with boulders of all sizes here and there, and numberless little tarns scattered over its surface. Life would gradually find its way back. Some life there would be indeed, all along, Bears and a few other animals and some birds would be there, but now from the droppings of birds would begin to spring a varied vegetation. Seeds would come floating in the wind, or adhering to the bodies of animals. Ducks would come to the little tarns, and to their webbed feet there might be sticking little pond snails, which they had brought from a hundred miles away, and the pond so visited might thereby become in a short time filled with snail-life to furnish food for wild ducks for centuries to come. I have lately made some investigation into the process of filling up one of these glacial tarns of Kildale.

I have already remarked "there is a world of interest involved in the tracing of pre-glacial river courses," but, I stated that I could not then stop to speak of them. I had said there was reason to believe that the chalk sea had extended over Cleveland right up to the Pennines. Well, when the land was raised above sea-level after the age of the chalk, there was a gradual slope from the crest of the Pennines to the Eastward, and a series of rivers would be initiated flowing downwards, according to the dip of the beds. Such rivers are called "consequent" rivers. The upper portion of some of these consequent rivers probably survive to-day in pretty much their original position as the Wear, Tees, Swale, Ure, Nidd, Wharfe, Aire, Calder. These rivers, in all probability, flowed right down to the East Coast. The Ouse, a "subsequent," tributary of the original Aire-Humber, working back among the soft strata of the Triassic Valley, has captured many of these rivers, and the Tees and Wear have been captured by "subsequents" working from the other end of the valley. What course then did these rivers originally follow? It is easy to race the Ure through the Gilling Gap to the Coast near Filey. I

think it is equally easy to trace the Tees through the Kildale Gap to the sea near Whitby. When the land had been reduced to the condition of a "peneplain," or more or less level track represented to some extent approximately by the tops of our moors, the Cleveland district was raised about the beginning of the Miocene time—the axis of the principal uplift running from Ingleby to Robin Hood's Bay. Then the streams received new force, due to deeper gradients, and the Esk has gone on ever since deepening the valley originally formed by the Tees.

I have said that when the ice finally retreated from Cleveland the surface of the ground would be sprinkled with many ponds. Nature would set to work to get rid of these—she would do this by two principal processes. On the one hand the rains would often fill some ponds to overflowing, and at the point of overflow a channel would be cut. This would in many cases deepen until the pond had been permanently drained off. On the other hand the ponds, especially those without a permanent outlet, would tend to become filled up by the solid matter carried into them by rain-wash. Even where there was little overflow of inorganic matter, Nature's efforts at obliteration would be helped forward by organic agencies. For example, pond snails would live and multiply in many of these ponds, and their dead shells would gradually accumulate at the bottom until they might form a very considerable thickness. Mosses and other plants too, might in course of time, form a great thickness of a peaty deposit. I have recently, with the kind help of Mr. P. Huntington, put down a series of borings into the matter filling up one of these old ponds at Kildale, and I found that near the centre of the pond, the peat and shell deposits were more than twenty feet in thickness. The Railway cutting near Kildale Station has been cut through this dead pond, and recently we put down a boring to a depth of thirty feet below the point reached by the cutting, or something like forty feet below the original surface at that point. At that depth we had got through the peat and the shells, but we did not meet with any obstruction, and were apparently in a deposit of sandy blue clay washed into the pond in the early stages of its post-glacial existence. When the Railway was made, remains of the Red Deer and the Reindeer were found near the surface at the junction of the peat and marl.

These I understand, were taken away by the contractor, and I have been unable to trace them. As I have a paper in preparation on this deposit for one of the learned Societies, I should be obliged to any reader of this note who could and would help

me in the quest. A member of the Geological Survey some years ago published an account of the deposit, but it is very imperfect and misleading. For example, most of the shells which he records as being found in it are the shells of the land-snails occurring on the surface! Some time ago I examined carefully a sample which I had obtained with equal care. From this I obtained 1,346 shells of pond-snails belonging to a half-a-dozen species, but not a single specimen of land-snail. Altogether I obtained 2,094 organisms from my samples. I have referred to the circumstance that some of the old glacial ponds were filled up with peat, with shelly marl and with soil washed into them. Some were to some extent filled up with iron. Mr. E. H. Wynne-Finch some months ago took me over to inspect certain deposits occurring on his property at Stanley Grange.

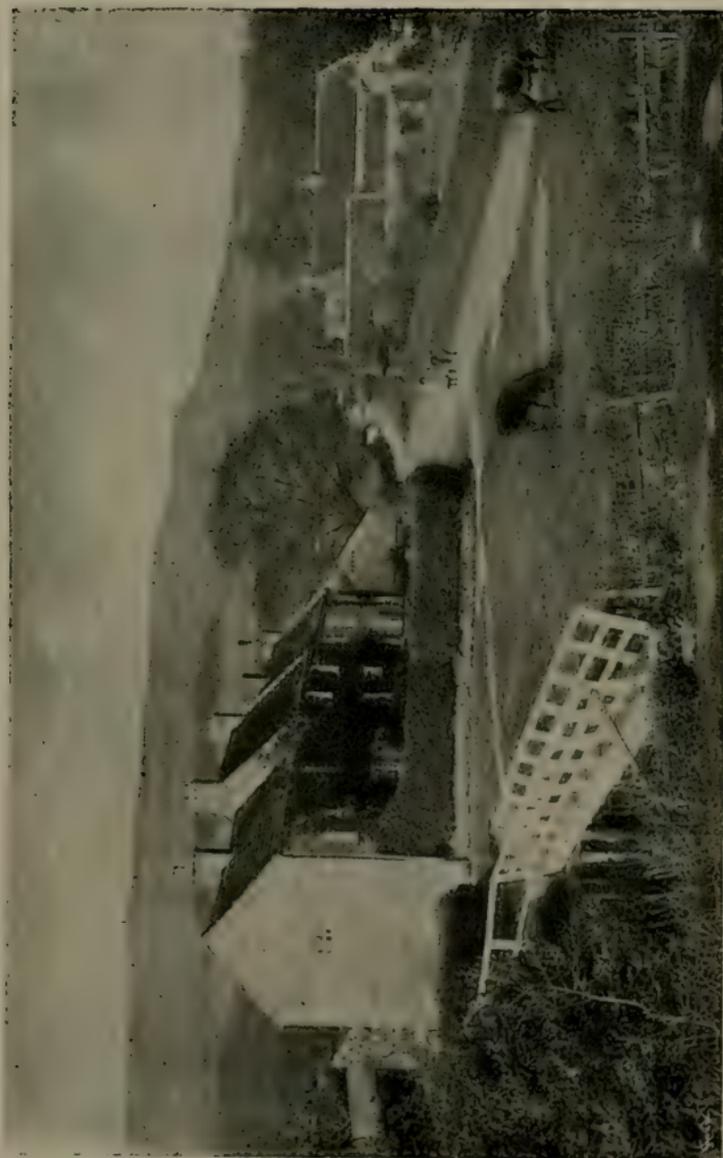
These deposits had been laid down in shallow marshy post-glacial ponds in which much vegetable matter had been present. Iron, the universal pigment of nature, is present almost everywhere.

In marshy flats, where the organic acids are freely supplied by rotting vegetation the salts of iron are dissolved, and exposure to the air leads to their oxydation, and the iron is thrown down in the form of ferric oxide, which we more commonly call "rust." This becomes mixed with other substances and forms "bog iron ore." But according to Ehrenberg, the formation of bog-ore is due, not merely to the chemical actions arising from the decay of organic matter, but to a power possessed by diatoms of separating iron from water and depositing it within their silicious framework. There is quite a thick deposit of bog-iron-ore at Stanley Grange, and in an adjoining field the deposit forms a hard thin iron-pan about half-an-inch thick below the present surface; forming an obstruction to the natural drainage of the land.

It is quite time we were getting into the human period of history, though it is perhaps the least interesting. In these scrappy notes we cannot pretend to give even a bare outline of the early history of the neighbourhood. For more information, I would refer readers to a paper which I am pledged to write in the course of the next day or two for publication in the "Proceedings of the Cleveland Field Club," on "The Evolution of Cleveland Scenery." One of these days it is possible I may write a little volume on the Geology of Cleveland, but there are several investigations to be made first. There is buried knowledge around us on every side only needing disinterment by the capable

scientist. My friend Professor Kendall's recent paper on the "Glacial Lake System of Cleveland," has been a revelation even to the most distinguished scientists of the day. But the solution of one problem only brings into view a score of other problems demanding solution. A few days ago my friend wrote "I feel that my work was very superficial, except so far as the very edge of the ice in this district was concerned. Could you not complete the case by working out the details of the closing stages of glaciation in the area between you and Whitby? I am sure there are interesting things to be done, and I have most of the six-inch maps, which are quite at your service if you will do the work." To this I can only reply that there are many things which it would be interesting to do if there were not a thousand other things claiming to be done. With regard to the recession of the ice, I will merely say at present, that it was a slow and irregular process, occupying possibly centuries. Palæolithic man may possibly have lived in our area before the ice came on, but, if so, the ice more forceful than Kishon of old, swept him away. On the retreat of the ice Neolithic man probably closely followed that retreat in company with animals which we now find only in sub-polar regions, and others which have disappeared altogether. Neolithic man was a long-headed fellow whose remains are found in long burial mounds, of which we have so far as I know no example in Cleveland, though they occur just outside the area. He was apparently followed and subdued by Bronze man of whom we have probably a very interesting memorial at Easby. He was a round-headed type of man, and built for his departed friends burrows of a round form.

The earliest remains of man that have as yet been discovered in the neighbourhood of Easby were first brought to the attention of archaeologists by myself some years ago, and they are of singular interest. In a commanding position surmounting that remarkable and beautifully wooded and precipitous bank girdled by the Leven before reaching the village of Easby is an earthwork of ancient date, and in an unusually perfect state of preservation. I was guided to its discovery by two local names. The name "Burrow Greens" seemed to imply a "burh" or entrenchment of some sort; the name "Castle Hills" seemed to imply something of the same sort, for in the North of England numerous Castle Hills occur of which the name is due not to a building of wood and stone, but to a simple earthwork, which doubtless originally carried on its circling mound a more or less strong wooden stockade. Where then was this "burh" this "castle" of Easby. I set out one day to make this quest, and



Block kindly lent by Mr. J. W. Brytton.

LOW EASBY.



PRINCE ALBERT
15 JUN 29
NATHAN

without much hope of finding any valid surviving evidence, for Cleveland had had several describers of its history and antiquities, and none of them had said a word of this castle. While believing that an earthwork must once have existed there I fully expected to find that no trace was left; that agriculturalists, who usually set little or no value on these remains of the remote past, who would have levelled the mound, filled in the ditch, and ploughed over the whole. It was therefore with as much surprise as pleasure that I found that the castle still survived in an excellent state of preservation.

In my last note under this head I referred to the "Castle" which once existed on the Easby Bank. But it must not be supposed that it was a castle of the usual modern kind. It dates from a time when strongholds were of a much simpler description. What remains at present is simply an earthwork consisting mainly of a raised mound enclosing a horse-shoe shaped piece of ground. Of course the figure of a horse-shoe does not enclose anything, but in this case the enclosure is completed by what I have elsewhere described as "an almost perpendicularly falling bank." The sides of the shoe are parallel instead of being somewhat convergent as in an ordinary horse-shoe, and the toe of the shoe is, of course, the part furthest away from the precipitous bank-edge. On the outer side of the mound there is a ditch which must once have been deep. The mound, too, must originally have been of considerable height. A year or two ago, with Mr. Emerson's kind permission and help, an excavation was made in the interior of the earthwork, not far from its centre, and it was found that there was an accumulation of about four feet of soil over the original surface of the ground. Most of this must have formed part of the original mound. Perhaps that is not quite a correct statement, for this ancient strength may have been in use possibly for at least a century or two, and as the soil became denuded it may have been replaced time after time with fresh soil brought from outside. This will explain why there is apparently a much greater quantity of soil fallen into the interior than into the ditch, which of course would be kept open so long as the strength was in use. On the occasion of the excavation referred to a flint scraper was found on or near the original surface of the ground, some four feet below the present surface. This was of a type which I have often found on our moors, and which is plentiful in connection with the burial mounds with which the higher points of our moorland are usually studded. We know that these were the tombs of the men who lived during the bronze age, that is from say 1,500 B.C.

to 500 B.C. They had not much bronze, however, and these flint scrapers are the commonest type of implement found among their relics. It is usually supposed that they were used for scraping the skins of animals. Sir Henry Howorth suggests, not very seriously, that they also used them for scraping their own skins. These round-headed, bronze-using men, then, who were buried on the moor tops, formed this Easby earthwork, which of course would have a wooden stockade on its crest. Within this space measuring some 50 yards in one direction by 40 in the other they either lived permanently, or took refuge with their flocks and herds and other belongings in time of danger.

That materials should exist for a history of Easby from far-away pre-historic time to the present day is, of course, by no means to be expected. All-conquering Rome sent to our Island her legions in the middle of the first century before Christ, and more effectively in the middle of the first century after Christ and they were not finally withdrawn until the year 410. But if any evidence whatever of the Roman occupation exists in the neighbourhood of Easby it is yet to be brought to light. Through Cleveland the Romans made roads—straight-up-hill and down-hill roads as was their wont, for they were a go-ahead people, and drove no motors. They passed along these roads from York and other stations to the coast, breaking their journey perhaps on the way now and then for a few days' hunting. Our neighbourhood was then probably a forest swamp to a great extent, uninviting for settlers certainly, and not without danger for the intrepid hunter. At the present moment; there is in Raisdale an unfenced bog into which a beast not long ago fell, and in which it disappeared entirely. And there must have been a great deal of such ground on the Cleveland lowlands 1,800 years ago. It may be that in days to come the sites of these ancient swamps may yield relics of Roman times entombed on some bright day devoted to the risky pleasures of the chase.

But now let us skip the centuries and come to the Danes who came in swarms upon the Yorkshire Coast in the ninth century. Cleveland appears to have remained to a large extent in its condition of virgin forest until their arrival, They were good farmers, and settled down in dry places, clearing away the trees around them, and bringing the land under the domination of their primitive ploughs. What has Easby to tell us about the Danish period? The name itself is eloquent in this regard. The Danish farmers, having seized upon lands in Yorkshire, were naturally desirous to "call their lands after their own names." And the name "Easby" and the great majority of place names

terminating in the suffix "by" witness thereby to their Danish origin. The word originally meant an abode or a single farm, but in time, as other houses rose around the first established one, it came rather to signify a village. A cow-byre is a place for cows, and a bye-law a law made by the village or township. So Easby, Battersby, Ingleby signify the houses or villages either belonging to certain individuals whose names are disguised in the first element of the place-name, or named after some local feature.

The second half of the name "Easby" appears to tell us that the Danes made a small settlement there some eleven hundred years ago. What then, does the first half of the name whisper to us? Truth to tell, the whisper is so faint that it is very difficult to catch its accents. Easby is the "place" of something or someone, the question is "of what or whom?" Ingleby and Battersby are the places of two Danish farmers whose names have been crystallized in those names. Poor serfs, they little dreamt that their names would be in daily use century after century in the "Cliffland" which they had so courageously invaded. It is not at all improbable that the name of Easby may also be derived from a personal name. The "s" in the centre of the word suggest a possessive case. Some might be inclined to derive it from one of the corruptions of the Celtic "uisge," which, according to Isaac Taylor, gives us the first part of the name of the River Eamont, which name, by the way, is a corruption of "Eamot," derived from that most remarkable "motte," or ancient place of assembly, Maybrough, "the fortification on the boundary," near Penrith. The Celtic word mentioned is certainly responsible for the names of Danby Wiske and of Whiskey, but for a plausible explanation of the name of Easby we do not want to stick a Danish affix on to a Celtic prefix. Mongrel names do occur, such as Nunthorpe, but they are usually open to suspicion. Graves, in "History of Cleveland," guesses that Easby signifies Eastby, and was so denominated because it was at the east end of the Parish of Stokesley. This is a guess which is quite certainly wrong, and, though the parochial system is said to have been introduced into England some two centuries earlier, I am far from being certain that the locality of Easby was at this date at the east end of a parish of Stokesley, and if it were, the Stokesley people would hardly have the honour of performing the functions of Godfathers and Godmothers in the naming ceremony. If I remember rightly—I am unable to make any reference—there was an Anglo-Saxon word, which probably had also a Danish form, which signified, in

the first place, "a beam," and in the second place, "a long ridge," from which the name might have come. And certainly, the long ridge round which the Leven winds is a natural feature such as might well have given name to settlement. But most probably the place-name is due to a Danish personal name.

THE COMMON CROSSBILL (*LOXIA CURVIROSTRA*)
IN CLEVELAND IN 1904.

B. FRANK R. ATKINSON.

The Crossbill is a bird I have always taken a considerable interest in, as he is so much out of the ordinary run of birds and one sees so little of him in these parts. Up till last year I had only seen two at large, both derelict migrants. The one I had most opportunity of watching was stranded in treeless Shetland where he had small chance of shewing off the arboreal habits of his kind amongst the stones and seaweed of that rocky coast. It was therefore with very great pleasure that last New Years Day while out for a long tramp over the hills that I spotted a suspicious band of birds in a fair sized larch tree which on nearer inspection proved to be the long hoped-for Crossbills. There were about 30 individuals in this flock which I had only short time to watch as something or other alarmed them and away they went calling loudly to one another and were no more seen. The call is rather like the rolling note of a greenfinch but much louder and the birds are very vociferous on the wing.

After this I took every opportunity of searching for the interesting strangers and after many days had the luck to come across them again some way from where I had made their acquaintance the first time. After this second rencontre I had frequent opportunities of observing them. I generally found that they were wild at first but on being quietly approached a second time they took very little notice of the intruder. They are remarkably interesting to watch at work on the pendant branches of some cone-laden larch as they busily feed. In form they are portly, plump, heavy, sedate looking birds, but whilst feeding on their favourite food, the seeds of the larch, they show great activity. Climbing and clambering about the branches in any and every

position, upside down, sideways down and all ways they are busily engaged in raking out the seeds from the cones. Silent and busy! I never heard one call while in a tree and the only sound to be heard was the pattering on the ground as they let the rifled cones fall. Busy they must be as anyone who will try to take the seeds from a larch cone will easily understand. The seeds are small and there are not many in a cone. The Crossbill is not a small bird and has a plump muscular body to support. Perforce therefore he must work busily during the short winter day to obtain sufficient to satisfy his appetite. But if he has to labour hard for his living he need never fear being out of work. His only competitor, here at least, is the squirrel and be the weather ever so hard his food is still within his reach.

Parrotlike they crawl and climb with help of beak and foot and gather together in bunches where cones are many. Well disposed to one another they seem, and there is no quarreling although they feed so close to one another and the same cone must often be coveted by two or more. Perhaps they have no time to quarrel.

One would often break off a cone and holding it in his beak swing himself up into the nearest horizontal bough and sitting there, holding the cone parrotwise in one foot would take out the seeds from the cone at leisure. Having finished, the cone is dropped and away sidles the crossbill down the nearest branch to the store of cones. It does not take long before the combined efforts of the flock or of as many as can get into the one tree, clear off all the cones, which they do most effectually, and then they move off to the nearest inviting looking tree again.

During the whole time I had them under observation I never saw them in any other tree than a larch and only on one occasion on the ground. This time they flew right out on to the moor and settled on the ling, where they remained quite a long time.

While feeding they generally seem to have several sentries posted in the tops of the neighbouring larches.

I took these birds to be sentries as if they or one of them rose with a loud call the rest of the flock followed them without more ado, generally however leaving two or three busy feeders behind who joined the main body later.

About sunset they seem to cease feeding and sit about in the tree tops.

There is a very conspicuous difference in the sizes of the various members of the flock, the red and reddish ones being the largest and the green yellow and grey flecked ones the smaller.

Between the first time I saw them and the last occasion on which they were assembled in one flock they received considerable accessions to their numbers so that at the last there must have been close on 200 of them.

Some time about the beginning of March the original large flock had split up into many small companies and three weeks later there were a fair number of odd pairs to be seen about the woods, but the main lot had left their former haunts. I am in hopes that some may have even bred here as I saw one pair as late as the beginning of May.

An unexpected opportunity gave me the chance of examining several specimens of this interesting bird more closely and this investigation proved most interesting.

The Crossbill is very well adapted for his mode of life and is highly specialized in many directions.

When examining this bird the first thing that strikes one is the outstanding feature of the beak from which he derives his popular and scientific names. It is very unlike an ordinary beak and the first glance suggests that the bird has suffered some accident in youth which had caused the points of his beak to cross instead of being opposed to one another as in the case of nearly every other kind of bird except Crossbills. But far from this unusual formation being a deformity it is as we shall find on looking more closely into the matter an adaptation of the beak to form a wonderful and ingenious tool for extracting the seed from the larch cones. The beaks do not cross in the same direction in all cases but cases in which the under beak curves up on the right side of the upper mandible as we look at the bird facing us are considerably more common than in which it comes up on the left side.

I have picked up many cones which had been rifled and with their aid have rehearsed the act of getting out the seed.

The holes and scratches on the cone gave the clue to the manner in which the beak was used.

It is apparent that there is a considerable side leverage on the lower mandible while the seeds are being extracted and if we examine the head of the bird it will be found that the muscles

supplying the force to counteract this side leverage are so developed that the side of the head on which the point of the under beak curves up is quite considerably larger than the other. Assymetry such as this is a rather rare phenomenon in nature.

Continuing our scrutiny we see that the birds nostrils are covered by stiff and woolly looking feathers which apparently exist either for the purpose of preventing dust or chips getting drawn in while they are engaged in robbing the cones of their burden or perhaps to exclude the keen air of their far northern habitat. I incline to think that their use is to keep out dust and chips.

The plumage is very dense and there is a thick substratum of down. This down and the bases of the contour feathers are always grey, the varying colours of the birds being due to the tips and edges of the contour feathers which are of different colours in different individuals. Birds of all colours between light grey through green and yellow to deep vermillion may be found but the female appears never to assume the red plumage

Their feet are large and strong with metatarsus short (the metatarsus is the unfeathered joint of the leg between the foot and true heel of the bird, which is often called the knee unscientifically). The three toes in front and one behind are covered with coarse scales above and beneath are rough and warty with large muscular pads at the joints. The nails are long and pointed and the two edges beneath are very sharp.

Their wings are long and narrow and the first pinion is generally the longest. The flight feathers are always brownish black with lighter edges partaking of the general colour of the individual bird. The tail is short and forked and of the same colour, the under and upper covering feathers being very long.

Their flesh when dead remains good a very long time perhaps owing to some preservative action of the turpentine contained in their food.

c. Thus far my own observations.

I, however, add some details gleaned from "Die Voegel Mittel Europas" of Naumann which seem to me of great interest.

Firstly, as to the beak and its shape.

“Quite young crossbills have the beak normally formed as in other birds but the already unequally developed muscles of the head shew in which direction the under mandible will cross the upper one. This condition of the beaks crossing on the one side or the other is therefore not determined by the way in which the bird uses its beak (as was formerly thought) but is already fixed in the embryo (or young before birth.)”

Secondly, as to breeding habits.

“They breed not only in spring but sometimes in the depth of winter, sometimes in summer and sometimes in spring, according to the plenty of food and with small regard to the weather.

Their nests, eggs and young, have been found in exceedingly severe weather and while much snow was present.”

Thirdly, with regard to their plumage and its changes.

“The young, before their first moult, are grey spotted and flecked with black. At the first moult they become yellowish or yellowish green and at the second the females acquire a more decidedly yellow or green dress while the males take on the red plumage for the first time, been deep dusky red or reddish. At the third moult and onwards the females do not change but the males become a brighter red and take on a more vivid hue at each succeeding moult.”

The consecutive changes detailed above form the normal course but there are all sorts of graduations and variations to be met with owing to the fact that these birds do not undergo a complete moult at any definite time of year as in the case of the majority of birds, but gradually during the whole course of the year they change their old feathers for new, so that it is a rare thing to come across a bird in one uniform dress except in the case of the very old birds which are, of course, in a great minority.

In this gradual moult we may see another instance of the adaptation of the bird for life in a high and cold latitude.

I have every hope of again meeting with my friends the Crossbills another year and of making further observations of their most interesting and unusual manner of life.

EXCEPTIONAL INFLUX OF BUZZARDS ON THE N.E. COAST DURING THE AUTUMN OF 1903.

BY FRANK R. ATKINSON.

The months of September, October and November, of 1903, witnessed an unusual influx of various species of Buzzards on the N. E. Coast and of these Cleveland received a fair share.

The Rough Legged Buzzard (*Archibuteo lagopus*) was by far the most plentiful, the Common Buzzard (*Buteo vulgaris*) much less so and of the Honey Buzzard (*Pernis apivorus*) one individual only was obtained (Redcar, Oct. 3rd.) to the knowledge of the present writer.

The first date of the appearance of the Buzzards seems to have been about September 14th, and they were still arriving on the coast in the middle of November. This seems to go to shew that the exceptional circumstances which led to their visiting us in such unwonted numbers were of long duration and operated for a period of two months at least.

The rough legged Buzzard appeared in comparatively large numbers and flocks of from three to five individuals were seen in many localities. A flock of even seven is said to have been seen at Glaisdale. These dispersed in a day or two and probably lived a good long time on the extensive moors in the neighbourhood. A fair number of others also were able to persist on the moors, as isolated individuals were shot at intervals up to the summer of 1904. The majority of the immigrants however would pass on and leave the district.

Many of the visitors fell victims to the gun and of those the writer had an opportunity of examining, the majority were young birds. This however, is only to be expected on the autumn flight when about 60/70 per cent. of the flocks are young of the year.

This exceptional influx was in all likelihood due to some unusual weather condition in the main breeding haunts of the buzzard in the North and North-east of Europe, We are able to surmise this from the fact that birds such as the Great Grey Shrike (*Lanius Excubitor*) a partial migrant, the Waxwing

(*Ampelis Garrulus*) and the Crossbill (*Loxia Curvirostra*) birds that have no regular migration but which visit us in some seasons, which are erratic wanderers in fact, from the same regions in which the Buzzard birds find their chief breeding haunts appeared in unusual numbers during the same season. Their arrivals continued after the stream of Buzzards had apparently dried up, and in the case of the Waxwing and Crossbill lasted till the end of January, 1904.

What the causes were which brought about these movements we can never know for certain but apparently what affected the buzzards affected the other birds mentioned also.

EXCURSION TO REDCAR ROCKS.

BY HENRY SIMPSON.

An extra meeting was arranged on Saturday, September 12, 1903, when the members of the Club to the number of upwards of twelve spent a very enjoyable and instructive three hours on Redcar Rocks. Undoubtedly more would have been present, but it was necessary on account of the tide to fix the visit for the morning. It is at no time, either on Saturday or any other day, possible to profitably arrange an excursion to these rocks for an afternoon, because when the tide is low during the afternoon it is always neap, and the rocks are never bare enough to allow of the study of marine botany, &c. Thus the seaside naturalist at Redcar must turn his attention to other fields of observation on the Saturday afternoons. In order to be, to some extent, independent of the tide the party requisitioned two boats, and visited first Saltscar, on which they spent the greater part of the time, and then Westscar. On the Saltscar rocks there was a general search for the sea anemones (*actinia*), for which these rocks are well-known. A considerable number of fine specimens were observed, but of two varieties only—the *Tealia crassicornis*, or *Dahlia Wartlet*, and the *Sagartia troglodytes* (cave-dwelling). The members looked in vain for the beautiful *Beadlet* (*actinia mesembryanthemum*) which is so plentiful to the east of Saltburn. Crabs in considerable numbers were captured and examined, and some large specimens of the edible crab (*Cancer pagurus*) were appropriated for

home consumption, but had to be returned afterwards to their native element, as it was found that the crabbing season having closed on August 31st it was illegal to take them ashore. The *Portunus puber* (fiddler crab), one of the few that can swim, and the spider and masked crabs were also met with. The hermit or soldier crabs (*Pagurus bernhardensis*) were a disappointment, they belied the second name. There were plenty of them and of all sizes but they could not be induced to entertain us with exhibitions of their pugnacity, and show what adepts they are in mutilating each other. Evidently on September 12, 1903, those on Saltscar were peacefully inclined. Of the echidna there were observed the *uraster rubens*, (common five-fingered starfish), the *ophiocomma neglecta* and *rosula* (brittle stars), and *solaster papposa* (sun star), two of the last-named being very fine specimens. No sea urchins were seen, they having apparently returned to the deep sea. Of shells noted during the day there were:—*Murex trunculus*, *purpura lapella* (dog whelk), *Buccinum undatum* (common whelk), *Littorina vulgaris* (periwinkle), *Frivia pediculus* (nun cowry), *Prochus zizyphinus*, *Maetra solida*, *Solen siliqua*, *Donax antinus*, and *Mytilus edulis* (mussel). Among the seaweeds examined were the beautiful *Delesseria sanguinea*, *Iridia edulis* (dulse), *Ulva latissima* (green sea lettuce), *Porphyra vulgata* (brown sea lettuce), *Fucus serratus* and *nodosus*. On Saltscar, wedged in some of the holes, the members came across a number of small dressed blocks of granite, of course water worn. It was thought that these had been lodged there for nearly a hundred years, for they probably were part of the cargo of the *Caledonia*, of Aberdeen, which was wrecked on these rocks on March 25, 1808, when 16 out of a crew of 23 were drowned. The vessel was laden with granite. It would be well if excursions could be organised more frequently for the study of marine natural history, not only to Redcar but also along the foot of the cliffs to the south east of Saltburn.

[The Club would be glad to receive papers on the Marine Fauna and Flora of the Cleveland Coast for the Proceedings.

Our thanks are due to Mr. Simpson for kindly arranging this meeting, which I am quite sure was appreciated by all who attended it.—T.A.L.]

OCCURRENCE OF THE BLACK RAT (*MUS RATTUS*)
AT MIDDLESBROUGH.

BY T. ASHTON LOFTHOUSE.

Some few months ago at one of the Winter Meetings held by the Club, a case of Black Rats [*Mus rattus*] was exhibited, the specimens having been taken at Stockton-on-Tees, where the species seems to occur frequently in the old warehouses and buildings in the vicinity of the river Tees. The above exhibit led to one of our members remarking to me (when seeing him some little time after the meeting at his Printing Works, at Middlesbrough), that his workmen had been trapping rats for some time, and he, noticing they were very dark coloured, it occurred to him that they might be the Black Rat. I asked him to send me the next one that was trapped, the result being that I received a specimen on November 11th, 1903, which proved to be, as he surmised, a specimen of the Black Rat (*Mus rattus*). This is a rather interesting addition to our Fauna, especially seeing that Middlesbrough is altogether a modern town, and has practically none of the old warehouses and buildings which this species is said to frequent, our oldest buildings, with one or two exceptions, only dating back a matter of 60 or 70 years. A local taxidermist informs me that on two occasions within the past two years he has had Middlesbrough specimens. It is possibly a species that is very much overlooked, and is probably of very much commoner occurrence than is generally credited. In regard to this species it states in Bell's British Quadrupeds that "The old English or Black Rat, which is now becoming a rare animal in this country, was, previously to the introduction of its more powerful congener and persecutor, the Brown Rat, as numerous and as extensively distributed as that species has since become."

Since the above paper was written I have seen specimens of the Black Rat that have been taken at Sir Raylton Dixon & Co's., Shipyard, Middlesbrough, recently, where I understand it is fairly common.

THE MONUMENTAL BRASSES OF CLEVELAND.

BY T. M. FALLOW, M.A., F.S.A.

Cleveland is not rich in Monumental Brasses, and there are none of any special interest or beauty. There are three brasses with engraved effigies, three plates with inscriptions, and two stones from which brasses have been stripped.

The most important, as it is also the most interesting of the Cleveland Brasses, is that in the little church or chapel of Roxby in the Parish of Hinderwell. The reduced facsimile of a heel-ball rubbing of the brass, which is given here, explains its character better than a verbal description can. The brass is to the memory of Thomas Boynton, Esquire, who died in 1523, and who, the inscription states, "caused this chyrche fyrst to be halowed and was ye fyrst corse that was beryed in yt." He was the son of Henry Boynton, Esquire, and married Cecily, daughter of James Strangeways, Esquire, of Sneaton, near Whitby. It will be seen, that the composition of the brass is that of a full length figure in armour in the centre, below which at an interval, is a plate with a black-letter inscription in English, and that there are four shields at the corners. The brass has been relaid on the present slab, and part of the sword has been broken off. In the reproduced rubbing the two lower shields have been brought nearer the centre to avoid too great a reduction of the whole device. Each of the shields bears the Boynton Arms—a *fesse between three crescents*. The figure, says Mr. Mill Stephenson, "which is clumsy and illproportioned, is armed in a collar of mail, breastplate, skirt of taces, with fringe of mail, over which are three very small leaf-shaped tonleteis. The pauldrons, or shoulder pieces, differ slightly in shape, that on the left shoulder having an upright ridge. The elbow-pieces also differ slightly. The knee-pieces are very large and the sabbatons round-toed, with gussets of mail at the insteps, and large rowel spurs. The sword, the greater part of which is lost, is supported by a narrow belt crossing the hips diagonally and having a somewhat complicated fastening." *The figure, it should be added is 25 inches in height.

* Yorkshire Archæological Journal, Vol. 17, P. 307.



man for the soule of Thomas Bonkton of London & for the
 soule of this church first to be halow'd & was a holy wife that
 was beynd in pt & dcedid the xxv day of maye the xxv of o
 god m & an & on whose soule I haue meren amen



The most interesting feature of the brass is the inscription in four lines, as follows:—

Pray for the soule of Thom's Boynton of Roysby
Esquier who caused this chyrche fyrst to be halowed
and was ye fyrst corse that was beryed in yt and
decessed the XXIX day of marche the yer of or Lord
god Ml Vc and XXIIJ on whose soule Jhu haue
mercy amen.

The church can only have been renewed, as there is evidence that a chapel existed at Roxby long before Thomas Boynton's time. The existing church (which was in a disgraceful state of neglect when the writer last visited it in 1903) was mainly rebuilt in 1818, though portions of the north wall are of the seventeenth century, but none of it is as old as Thomas Boynton's "chyrche." It contains one or two tombs of importance, and ought to be better cared for than seems to be the case. Close to the Church once stood the Mansion House of the Boyntons. Only a small corner remains near the west end of the Church. Each year, it is said, crops of large sized snowdrops flower in what was once the garden of the house.

The brass next in importance is that on the floor south of the Altar in Kirkleatham Church, to the memory of Robert Coulthirst. It is a notable instance of a brass of the seventeenth century, following in its arrangement the features of a brass of much earlier date. In the centre is a full length effigy of Robert Coulthirst, 3ft. 10ins. in height. He is represented in civilian costume, and, as in late brasses, is standing in perspective on a pavement or floor. The figure conveys the idea that it is a real portrait of Robert Coulthirst, and not merely the conventional figure of an old man. Round the slab, as was common in earlier brasses, is a narrow rim of brass bearing the legend, and at the four corners of the slab are four shields, each charged with the arms of the Merchant Taylors' Company of London. The legend reads:—
"HERE LYETH BURYED THE BODY OF ROBERT
COVLTHIRST FREE OF $\frac{E}{Y}$ MARCHANTAYLORS OF
LONDON AND LATE OF VPLEATHAM | GENT: WHO
DEPARTED THIS LIFE $\frac{E}{Y}$ 7TH OF | AVGVST 1631 BEING
OF THE AGE OF 90 YEARES WHOSE SOVLE RESTETH
WTH $\frac{E}{Y}$ ALMIGHTEY.



Robert Coulthirst was the son of Henry Coulthirst, of Upleatham, by Elizabeth Rudd his wife. His daughter Elizabeth married John Turner, of Kirkleatham. One is tempted to moralise on the striking changes in creed, manners, and customs, which old Robert Coulthirst must have witnessed during the six reigns of Henry VIII., Edward VI, Mary, Elizabeth, James I, and Charles I, in which his life was cast.

The other brass, with an engraved effigy, is a plate 11 inches in height, also at Kirkleatham, and just to the east of Robert Coulthirst's. It is of a type of a child's brass not uncommon at the period to which it belongs. The illustration practically describes all that there is to say as to it.



HERE LYETH Y^E BODY OF DORATHY
 DAUGHT^R OF JOHN TURNOR GENT AND
 ELIZA: HIS WYFE, WHO DEPTED
 THIS LIFE THE 26TH OF FEBRVARY
 AN^O DNT 1628. BEING OF Y^E AGE
 OF 4 YEARES 2. MONETHES & 6 DAYS

Dorothy Turner, it may be added, was the third daughter of John and Elizabeth Turner, and sister of John Turner, Serjeant-at-Law, and of Sir William Turner, Lord Mayor of London in 1669, the munificent founder of the Hospital at Kirkleatham, and other charities connected with that parish.

Besides these two brasses, there is a third at Kirkleatham, in the middle walk of the nave. It is an inscription, in black letter, on a plate measuring $21\frac{1}{2}$ by $4\frac{1}{2}$ inches. The letters are raised instead of being incised, and the inscription is much worn, and portions of it are very bad to make out. It seems to read in four lines:—

**Orate pro ai'abz Thome Lambert et agnetis ux'is sue de
Keyrk letham**

**qui quidem Thomas obiit qui'to (?) die mensis
septembris Anno domini.**

**mill'mo CCCCLIJ (?) et dicta agnes obiit.....die mensis
Marcii**

**Anno domini mill'mo CCCCLIIJ (?) quorum ai'abz
p'piciet' d's amen.**

Thomas and Agnes Lambert were probably the parents of William Lambert, Master of Staindrop Collegiate Church, to which establishment the rectory of Kirkleatham was appropriated in 1423. William Lambert bequeathed in 1485 a silver gilt pix for the Sacrament of the Altar at Kirkleatham.

Westward of this brass is a slab, bearing a much worn indent of a large brass, of a priest in chasuble. Round the edge was an inscription, at the four corners of which were the symbols of the four Evangelists.

At Guisbrough there is a brass plate, 19 by 7 inches, with the following inscription in Roman capital letters:—

A VERTVOVS WIFE, THIS MARBLE STONE DOTH HIDE,
ASSVREDLY, A SAINT IN HEAVEN SHEE'S TRYDE;
RELIGIOVS WAS HER LIFE, THE LIKE HER END,
IN SEEKING CHRIST, SHE MOST HER TIME DID SPEND.
IF READER THOV HER NAME DESIRE TO KNOW?
SVSANNA CHASTE THE SAME, PYCKERING IOYN'D TOO.

OBIIIT 22° Sept: A° 1641.

The remaining brass, with an inscription, is at Brotton. It is much damaged and broken, and is fixed to a small stone cross in the churchyard. The brass was probably cast out of the old church when it was rebuilt in 1740. At the top of the brass

(which in its present broken condition measures 12 by 8½ inches) has been a shield of arms of the Blacksmiths Company of London. Only a little of this remains. Below it, in cursive lettering, is the legend :—

Here lyeth ye body of Tho Pressick,
Blacksmith who departed this life
March ye 24th, Anno Dom' 1710
Aged 74 years

Wrong him not when he is gone
For whilst he liv'd he wronged none
Mors mea vita mihi.

The remaining trace of a brass is in the chancel of the old Church of Skelton, where, on the floor, is a slab with the indent of a brass of a man and wife and several children, and with scrolls for legends. It looks as if it may have held a brass of the latter part of the fifteenth century. Whom it commemorated is unknown.

A GRAVEL DEPOSIT IN LONSDALE.

By FRANK ELGEE.

In September, 1904, I discovered a gravel deposit in Lonsdale, which I think is of sufficient interest to be placed on record, as it has some bearing upon the origin of that curious gap in the Cleveland Hills at Gribdalegate.

The deposit in question I found exposed in the side of Lonsdale Beck about half way between Lonsdale Farm and Lonsdale Cottages. The section was as follows :—

1. Soil and sub-soil.
2. Stiffish bluish clay with small stones.
3. Bedded gravel with shale and sandstone pebbles.
4. Thin band of blue clay.
5. Coarser gravel consisting almost entirely of local sandstone and shale, with quartz pebbles, and a small boulder of Shap Granite.

The origin of this bed of gravel is not far to seek. According to Mr. P. F. Kendall, Gribdalegate has been formed during the Ice Age, by an overflow of water from the Ayton side of the hills into Lonsdale, caused by a pounding back of the drainage of the small streams that flow into the Leven by the ice.* Hence a considerable quantity of detritus produced by the erosion of the gap would be carried into Lonsdale and laid down under the static waters of Lake Eskdale, of which Lake Lonsdale would form a branch. Gribdalegate has been cut in sandstone and Upper Lias shale; hence the preponderance of those materials in the gravel bed. At the same time the boulder of Shap Granite would be carried into the dale from the ice front together with the vein quartz pebbles and a small piece of Carboniferous Limestone which I found in a field near the gravel bed. These three erratics are very characteristic of the Stainmoor Teesdale glacier.

I think, therefore, that this gravel deposit proves in a conclusive manner that Gribdalegate is a deserted glacier lake overflow as suggested by Mr. Kendall. Another fact in favour of this conclusion not mentioned by Mr. Kendall is that the level at which Gribdalegate commenced to be formed is the lowest point in the escarpment between Newton Moor and Easby Moor; and consequently the impounded waters would overflow at this lowest point into Lonsdale.

* Q. J. G. S., Vol. 58, p. 515.

CLEVELAND LEPIDOPTERA IN 1903.

BY T. ASHTON LOFTHOUSE, F. E. S.

*Denotes Species recorded in our Proceedings for first time.

On the whole the weather prevailing during the season was very unfavourable for insect life, in fact, the conditions were little, if any, more favourable than that prevailing in 1902, which was one of the worst (if not the very worst) season I have ever experienced, for the study of insect life.

Owing to the high and cold winds prevailing in the early part of the year, the sallow bloom (which is one of the early attractions to moths) was out and over in a very short time and proved of no use for collecting purposes.

A noteworthy feature of the season was an immigration of the Painted Lady Butterfly (*Vanessa cardui*), the Silver Y Moth (*Plusia gamma*), &c., which took place after a period of fine, dry weather, about the third week in September, and of which further particulars are included in my notes.

DIURNI. *Vanessa cardui*. This butterfly was very common in the district (and along the East Coast from N. to S.) from the 19th to the end of September. Reported as being very abundant at Redcar, (Ingham). Great numbers on sea wall and banks adjoining between Middlesbrough and Redcar. Single specimens noticed in gardens at Linthorpe, Middlesbrough. Several noticed in fields near Ingleby Arncliffe on the 26th. Five specimens noticed at Ingleby Greenhow on the 28th (Frank Elgee).

NOCTURNI. *Acherontia atropos*. A worn specimen of the "Deaths Head" moth taken off the staircase window of house Cambridge Road, Linthorpe, about 7-30 a.m., on June 25th, after very wet night. Most probably a migrant, being very worn; it appeared to be a female and had apparently laid its ova, the body being quite empty.

****Nola confusalis*.** Took a fresh specimen off beech tree trunk in Mulgrave Park, Sandsend, in early June.

***Saturnia pavonia*.** Took a freshly emerged female to Eston Moors, on May 23rd, for the purpose of "assembling" males. I tied it up in the net and suspended it from a post on the open moor between 1.45 p.m. and 3.30, males soon began to "assemble," sometimes five or six flying round at one time and during the above period I should say some forty or more males were attracted, they seemed to come most freely when a little breeze sprang up and the sun shone brightly, they were quite easy to take and did not require netting. One or two males were attracted even after I had placed the female in a chip box in my pocket. One specimen taken was a rather nice variety the colouring being very much darker and blacker and the orange colouring much less conspicuous than usual.

NOCTUÆ **Xylophasia zollikoferi*. I was fortunate in taking a specimen of this, one of our greatest British rarities, off sugar in my own garden at Linthorpe, Middlesbrough, on September 26th. The specimen was sent to Mr. C. G. Barrett (on the recommendation of my friend Mr. G. T. Porritt) for identification. He was uncertain as to its identity and took it

to South Kensington Museum, where he, along with Sir Geo. Hampson, Bart., identified it by comparing it with European specimens in that collection.

There are only two previous British records of this insect as far as I know, one being taken at Deal, in 1867, and one near Aberdeen, in 1871.

It is perhaps worthy of note that the insect was captured during the period when the immigration of *Vanessa cardui* took place.

The specimen taken by me was in good condition and has been exhibited at a meeting of the Entomological Society in London, and a coloured plate of it has been included in the Lepidoptera of the British Islands, by Charles G. Barrett, F.E.S., which is now in course of publication.

Apamea basilinea. A fine, dark variety taken off sugar in garden, at Linthorpe.

Stilbia anomala. A damaged specimen, netted at dusk, near Great Ayton, in August.

Noctua stigmatica. Taken at flowers of wild sage, near Glaisdale, in August.

Noctua festiva var. conflua. Several fine specimens taken off sugar, at Glaisdale, in August.

Xanthia citrigo. Two specimens noticed at Great Ayton. (F. R. Atkinson).

GEOMETRÆ. Eurymene dolobraria. Specimen taken at Thornaby, by Mr. Proud, on July 1st.

***Acidalia inornata.** Taken in August, near Great Ayton.

***Eupithecia abbreviata.** Bred from larvæ beaten out of oak near Kildale.

***Thera firmata.** Near Ayton, in September, also been taken on Eston Hills.

Anticlea nigrofasciaria. Sandsend.

Cidaria prunata. Taken at Great Ayton (F. R. Atkinson).

***Cidaria associata.** Great Ayton (F. R. Atkinson), also taken at Normanby, in 1904. (T. B.)

***Hydrocampa nymphæata.** Specimens taken at sugar in garden, Linthorpe, Middlesbrough.

***Pterophorus monodactylus.** At sugar in October at Linthorpe.

***Crambus inquinatellus.** Great Ayton.

***Aphomia sociella.** Taken at light, Glaisdale.

***Amphisa gerningana.** Great Ayton.

***Pædisca solandriana.** Kilton Woods, near Loftus.

***Halonota bimaculana.** On August 29th, at Ingleby Greenhow.

***Pleurota bicostella.** Taken off grasses on Glaisdale Moors.

CLEVELAND LEPIDOPTERA IN 1904.

The weather prevailing during this year was a great improvement on the past two or three years and much more likely to be favourable for insect life, but notwithstanding the favourable weather the *macro lepidoptera* were, if anything, even scarcer than during the past years, this result no doubt being attributable in a great measure to the cold, wet and sunless weather prevailing during the past two or three summers having proved very destructive to insect life in the earlier stages. Another factor which probably militated to a great extent against "sugar" which proved a total failure throughout the season, was the great abundance of "honeydew" which prevailed as a result of the fine, dry weather, which we had for the most part of the summer.

Owing to the scarcity of the larger insects, I devoted my attention more to the *micros* than usual with the result that I have been enabled to add a good many new species to our local list, and one of which proves to be an addition to Mr. Porritt's list of Yorkshire Lepidoptera.

I am indebted to Mr. Jno. Gardner, of Hartlepool, and Mr. Eustace Bankes, of Corfe Castle, for assistance in naming most of the *micros* recorded below.

Nocturni. Sphinx convolvuli. Convolvulus Hawk Moth. "I had a specimen of this moth sent from Acklam, in September, but having been put in a match box (!) it was unfortunately quite spoiled." (Frank Elgee).

Trochilium crabroniformis. Hornet clearwing. "This fine insect was very abundant in the Albert Park, in July. Its wood feeding larvæ are working havoc among the black poplar trees there." (Frank Elgee).

Noctuæ. Xylophasia rurea var combusta.—Taken off sugar, at Linthorpe.

Agrotis saucia. Two specimens at sugar in garden, Linthorpe, in October.

Tæniocampa munda. Taken off shallows in Saltburn Wood, in April.

Hadena adusta. "On July 4th, at sugar, in Kensington Road, forming an addition to the list of Kensington Road species, and hitherto only recorded from Kildale in our Proceedings." (Frank Elgee).

Heliaca tenebrata. Several flying in sun at Great Ayton, in early June, also noticed near Stainton, in Cleveland.

***Chariclea umbra.** Noticed flying over Restharrow flowers, near Redcar.

***Plusia pulchrina.** At valerian flowers in garden, at Linthorpe.

Geometræ. *Acidalia remutaria. Taken in Kilton Woods, on June 18th.

***Numeria pulveraria.** Taken in Kilton Woods, in June.

***Oporabia autumnaria.** A variable series of this insect taken at Kildale in October.

***Eupithecia oblongata.** Two specimens taken by Mr. Clutton at Marske on August 10th.

***Eupithecia sobrinata.** Specimen bred from larvæ taken off juniper in garden at Linthorpe, no doubt introduced with shrubs, which probably came from Dutch nurseries.

Hypsipetes ruberata. Bred from Kildale pupæ, also taken at Ingleby Greenhow and Glaisdale.

Melanthia bicolorata v. plumbata. Few nice specimens of this variety taken at Kildale.

Coremia ferrugata A fine narrow banded variety captured near Great Ayton.

***Melanippe galiata.** Noted on occasion of Field Club's excursion at Glaisdale on July 9th.

PYRALIDES. ***Scoparia ambigualis.** Common. Great Ayton, Kildale, Eston, Kilton, etc.

***Scoparia cembræ.** At light in July at Grangetown Station.

***Scoparia dubitalis.** = [Pyralella]. Common at Glaisdale in July.

***Scoparia murana.** Great Ayton.

PTEROPHORI. ***Platyptilia gonodactyla.** Taken at dusk at Skinningrove on June 18th.

***Mimæseoptilus plagiodyctylus.** Great Ayton in July.

CRAMBIDÆ. ***Crambus margaritellus.** Great Ayton. July.

***Crambus perlellus.** Single specimen. Redcar.

PHYCIDÆ. ***Anerastia lotella.** Common near Redcar in July.

TOKTRICES. ***Peronea mixtana.** Kildale in April.

***Rhacodia caudana.** Kilton Woods. August.

***Cnephasia politana.** Glaisdale in May.

***Cnephasia musculana.** Glaisdale and Eston.

***Sciaphila virgaureana.** Redcar. July.

***Sciaphila pascuana.** Eston Hills. August 27.

***Clepsia rusticana.** Glaisdale.

***Bactra lanceolana.** Ayton, Grangetown, etc.

**Phoxopteryx lundana*. Ayton.

**Ephippiphora cirsiiana*. Kilton Woods. August.

**Ephippiphora grandævana*. Redcar. This insect is not recorded in Porrit's list of Yorkshire Lepidoptera. I have taken it occasionally previously on the Durham side of the Tees.

**Symethis oxyacanthella*. = (*Fabriciana*). Easby.

**Xanthosetia hamana*. Redcar.

**Aphelia osseana*. Common among bent grass on sand banks at Redcar. Also taken at Great Ayton.

TINEÆ. **Blabophanes rusticella*. Great Ayton and Eston.

**Micropteryx semipurpurella*. Several noticed among beech at Carlton-in-Cleveland in April.

**Plutella cruciferarum*. Glaisdale.

**Depressaria applana*. Glaisdale.

**Gelechia longicornis*. Eston Hills in June.

**Lita maculea*. Two bred, Glaisdale.

**Lita marmorea*. Redcar.

**Glyphipteryx fuscoviridella*. On railway embankment near Ayton in June.

**Elachista kilmunella*. Kildale.

ROBERT GEORGE CLAYTON.

DIED, JUNE 27TH, 1903.

Mr. R. G. Clayton was the son of Mr. John Clayton, now of Stokesley. On leaving school Mr. Clayton was indentured to the firm of Messrs. J. P. Hornung and Sons, and when that firm mutually dissolved, joined Mr. W. J. Watson, and for over 18 years he was his principal assistant.

He was very well-known in the town and district and enjoyed the confidence of a large circle of friends. He took an active

part in many affairs of the town of Middlesbrough, being a member of the Free Library and Museum Committee, a member of the Literary and Philosophical Society, Conservative Club, and a prominent Freemason, being, at the time of his decease, W.M. of the Orde Powlett Lodge.

He had been a prominent member of the Cleveland Naturalists' Field Club for many years, having joined the Society in 1889; he was elected on the Committee in 1891 and served as a member of that Committee up to the time of his decease, taking an active part in the management of the Club and being a regular attender at the Meetings. He was also Sectional Secretary to the Ornithology and Mammalogy Committee, and frequently contributed notes to the Club's Proceedings on Ornithology, Mammalogy, etc.

He was a very keen and enthusiastic observer of nature, he having a particularly good acquaintance with the birds occurring in the Cleveland District, which he had made a special study of for many years.

ANGUS MACPHERSON.

BORN, 30TH MARCH, 1827, DIED, FEBRUARY 2ND, 1904.

“ Grow old along with me!
The best is yet to be,
The last of life, for which the first was made.”

By the passing onwards of Mr. Angus Macpherson a noteworthy personage has been removed from among Cleveland Naturalists. Although of late he was not often found at the Field Excursions of the Club, in the early years of its existence he was one of the most familiar figures at its meetings. One of the first members of the Cleveland Naturalists' Field Club he always took a deep interest in its proceedings since its foundation in 1881 and, despite the fact that he did not claim to be a specialist in any department of Natural History, his keen powers of observation and well trained mind made him ever an interesting and instructive companion. He was thrice elected to the Presidency of the Club, 1886, 1887 and 1894, and has at various times lectured to the members.

Mr. Macpherson was a man of no small literary ability, and during his long lifetime was the author of many books and pamphlets. In early life he was joint editor with his brother of the *West of Scotland Magazine*, and later was one of the proprietors and a constant contributor to a weekly journal entitled *Domine* which was started in Middlesbrough in May, 1875. One of the most popular editions of Burns' poems was edited by Mr. Macpherson, and locally we are indebted to him for a booklet entitled "Rambles in South Durham and North Yorkshire," which was published in 1888.

Born in Glasgow, in 1827, Mr. Macpherson led a long and useful life, and when he passed away in February, 1904, in his 77th year, all who had the privilege of his acquaintance mourned the loss of a valued and loved friend. Although living to a ripe old age, Mr. Macpherson always retained a vigour of body and a youthfulness of spirit, which, combined with a ready wit, made him the pleasantest of companions. Mentally he was alive to the latest discoveries in every department of human knowledge, for he had one of those rare minds which preserves the freshness of youth whilst attaining the wisdom of years

REPORT ON THE COLEOPTERA OBSERVED IN
CLEVELAND.

BY M. LAWSON THOMPSON, F.E.S.

In the following notes on the occurrence of Beetles in 1903 and 1904 I have brought together the result of visits to two or three well-known localities in Cleveland. Very few of the rarer species were met with during these years. I have, however, included in this report a number of common insects known to inhabit these parts of the district, and which may appropriately be recorded here.

COLEOPTERA.

Nebria livida, F.—Common on the Coast at Saltburn.

Nebria brevicollis, F.—Common, Saltburn; Stanghow Moor; Kildale.

Nebria gyllenhali, Sch.—Saltburn, on the Coast; Reservoir at Lockwood Beck.

Clivina fossor, L.—Common at Saltburn.

Bradycellus similis, Dej.—Common on the Cleveland Moors.

Calathus cisteloides, Panz.—Common, Saltburn; Kildale.

Calathus flavipes, Fourc.—Kildale; Stanghow Moor; Redcar.

Calathus mollis, Marsh.—Common at Saltburn.

Calathus melanocephalus, L.—Common; Saltburn; Stanghow Moor.

Anchomenus albipes.—Common; Saltburn; Reservoir at Lockwood Beck; Kilton Wood.

Bembidium nitidulum, Marsh.—Saltburn; Stanghow Moor; Common.

Bembidium atrocæruleum, Steph. and **B punctulatum**, Drap. Common in Saltburn Wood.

Trechus minutus, F.—Common at Saltburn; Eston.

Trechus rubens, F.—On the margin of the Reservoir at Lockwood Beck near Saltburn. One specimen in August, 1904.

Agabus guttatus, Payk, and **A. bipustulatus**, L.—Common Saltburn; Stanghow Moor.

Octhebius rufimarginatus, Steph.—In a pond at Saltburn (May, 1903).

Sphæridium scarabæoides, F. and **S. bipustulatum**, F.—Common at Saltburn.

Megasternum boletophagum, Marsh.—Common; Saltburn; Kildale.

Oxypoda longiuscula, Er., **O. Opaca**, Grav., and **O. alternans**, Grav.—Common at Saltburn.

Ocalea castanea, Er.—Saltburn.

Homalota vicina Steph., **H. fungicola**, Thoms, **H. atramentaria**, Gyll, and **H. fungi**, Grav.—Common at Saltburn.

Autalia impressa, Ol.—Common at Saltburn.

Agaricochara lævicollis, Er.—Saltburn Wood, in decaying fungi (October, 1904).

Conosoma lividum, Er., and **C. pubescens**, Grav.—Common at Saltburn.

Tachyporus obtusus, L.—Guisborough; Common in Cleveland.

Tachyporus chrysomelinus, L., **T. hypnorum**, F., and **T. pusillus**. Grav.—Common at Saltburn.

Tachinus pallipes, Grav.—Saltburn Wood, in decaying fungi (September, 1903).

Tachinus rufipes, L., and **T. marginellus**, F.—Common at Saltburn; Guisborough.

Megacronus inclinans Grav. Saltburn Wood, in decaying fungi. One specimen on August 28th, 1903.

Bolitobius lunulatus, L. **Bolitobius trinotatus**, Er. and **Bolitobius pygmæus**, F.—Common at Saltburn, in decaying fungi.

Mycetoporus splendidus, Grav.—On the sea banks at Saltburn (June, 1904).

Quedius lateralis, Grav.—Saltburn Wood, in decaying fungi.—Common in September, 1903.

Ocypus olens Müll, and **O. morio**, Grav.—Common in Cleveland.

Philonthus laminatus. Creutz.—Common at Saltburn; Redcar.

Xantholinus glabratus, Grav.—Common, Saltburn; Redcar.

Stenus flavipes, Steph. (**filum Er.**) and **S. similis**, Herbst. Common at Kildale.

Oxytelus rugosus, Grav. and **O. tetacarinatus**. Block.—Common; Saltburn; Kildale; Guisborough.

Anthophagus testaceus, Grav.—Saltburn Wood; Kilton Wood. Common.

Deleaster dichrous, Grav. Var. **Leachi**. Curt.—Saltburn; at the foot of the sea-banks. One specimen in June, 1904.

Geodromicus nigrita, Müll.—On the margin of the Reservoir at Lockwood Beck, near Saltburn (July, 1904).

Proteinus brachypterus, F.—Common in decaying fungi, Saltburn; Kildale.

Choleva grandicollis, Er.—On the moor at Kildale, in a dead hedgehog (August, 1903).

Coccinella 10-punctata, L., and **C. 11-punctata**, L.—Common at Redcar and Saltburn.

Halyzia 14-guttata, L.—Saltburn; Kilton Wood.

Brachypterus urticæ. F. and **B. pubescens**, Er.—Common at Saltburn; Kildale; Guisborough.

Meligethes æneus, F., **M. viridescens** and **M. picipes**. Sturm.—Common at Saltburn and Kildale.

Coninomos nodifer, Westw.—Common, Saltburn; Guisborough.

Enicmus minutus, L. and **E. transversus**, Ol.—Common at Saltburn and Kilton Wood.

Micrambe vini, Panz.—Saltburn; Guisborough Common.

Aphodius fimetarius, L., *A. ater*, De G., *A. merdarius*, F., *A. punctato-sulcatus*, Stm., and *A. rufipes*, L.—Common at Saltburn.

Aphodius pusillus, Hbst.—Saltburn. One specimen in June, 1904.

Ægialia arenaria, F.—Common at Saltburn on the sandhills.

Geotrupes stercorarius, L.—Common in Cleveland.

Athous hæmorrhoidalis, F.—Common. Saltburn; Guisborough; Kildale.

Adrastus limbatus, F.—Kilton Wood; Guisborough. Common.

Ægriotes obscurus, L.—Common. Saltburn; Kilton Wood.

Ægriotes sobrinus, Kies.—Saltburn.

Corymbites quercus, Gyll.—Saltburn; Kilton Wood. Common.

Telephorus lividus, L., *T. pellucidus*, F., and *T. flavilabris*, Fall.—Common at Saltburn.

Rhagonycha fuscicornis, Ol.—Saltburn (July, 1903).

Rhagonycha limbata, Thoms, and *R. pallida*, F.—Common in Kilton Wood.

Malthodes marginatus, Latr, and *M. minimus*, L.—Common at Saltburn and in Kilton Wood.

Malthodes atomus, Thoms.—Kilton Wood.

Chrysomela polita, L., and *C. staphylea*, L.—Common in Cleveland.

Phædon tumidulus, Germ.—Common in Cleveland.

Phyllodecta vitellinæ, L.—Common at Saltburn.

Longitarsus anchusæ, Payk, *L. melanocephalus*, De G. and *L. Jacobææ*, Wat.—Kilton Wood; Saltburn. Common.

Haltica oleracea, L.—Common at Saltburn.

Crepidodera smaragdina, Fourc.—On sallows in Kilton Wood (July, 1903).

Chætocnema hortensis, Fourc.—Redcar.

Plectroscelis concinna, Marsh.—Saltburn; Kilton Wood. Common.

Rhinosimus planirostris, F.—Saltburn, Kildale. Common.

Anaspis frontalis, L and *A. rufilabris*, Gyll.—Common at Saltburn.

Apion ulicis, Forst. and *A. pallipes*, Kirby.—Common at Saltburn and Guisborough.

Apion unicolor, Kirby (*platalea*, Germ).—Kildale; August, 1904.

Apion violaceum, Kirby. *A. apricans*, Hbst. *A. carduorum*, Kirby, and *A. humile*, Germ.—Kildale; Saltburn Common.

Otiorynchus picipes, F.—Saltburn; Kildale, Common.

Strophosomus coryli, F.—Saltburn; Kilton Wood. Common.

Strophosomus lateralis, Payk.—Common on Stanghow Moor.

Sciaphilus muricatus, F.—Common. Saltburn; Kilton Wood; Kildale.

Polydrusus pterygomalis, Boh.—Common. Saltburn; Kilton Wood.

Phyllobius urticæ, De G., *P. oblongus*, L., *P. pyri*, L., and *P. viridiæris*, Laich.—Common. Saltburn; Kilton Wood.

Philopeton geminatus, F.—Common on the Saltburn sandhills.

Sitones regensteinensis, Herbst, **S. tibialis**, Herbst, **S. flavescens**, Marsh, **S. sulcifrons**, Thumb, **S. hispidulus**, F., and **S. lineatus**, L.—Common at Saltburn.

Liosoma ovatum.—Clair, Saltburn, Kilton Wood, Guisborough. Common

Orchestes fagi, L. On the beech at Guisborough.

Dorytomus pectoralis, Gyll.—On willows at Saltburn (July, 1904).

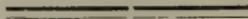
Mecinus pyrastrer, Hubst.—Common on *Plantago lanceolata*; Saltburn; Kildale.

Cœliodes quadrimaculatus, L.—Common on nettles in Cleveland.

Ceuthorrhynohus ericæ, Gyll.—Common on ling and heather; Stanghow Moor; Kildale.

Ceuthorrhynohus pollinarius, Forst.—Common on nettles in Cleveland.

Rhinoncus pericarpus, L.—Kilton Wood, on *Polygonum*.



*METEOROLOGICAL RECORD, AT LINTHORPE, MIDDLESBROUGH, IN 1904.
 BY C. LOWTHIAN BELL.

1904
 MONTH
BAROMETER

	JANUARY.	FEBRUARY.	MARCH.	APRIL.	MAY.	JUNE.
Highest	30.677	30.380	30.187	30.313	30.238	30.352
On the	22nd	28th	24th	19th	20th	4th
Lowest	28.696	28.737	29.194	29.544	29.398	29.432
On the	14th	13th	30th	14th	2nd	25th
Mean	29.832	29.511	29.984	29.826	29.885	30.015

THERMOMETER Max.

Mean	44	42	44	54	57	61
Highest	54	57	56	60	71	71
on the	28th	21st	21st	9th, 25th & 30th...	26th	30th
Lowest	34	33	36	47	52	51
on the	25th	28th	7th	2nd	22nd	12th
Min. Mean	34	33	34	40	43	48
Highest	44	39	44	49	53	53
on the	28th	21st & 22nd	21st	29th	17th	15, 17 & 19th
Lowest	27	27	27	30	32	39
on the	22th & 25th	28th	12th	12th	20th	3rd
Dry Mean	39	36	38	48	52	55
Highest	50	47	53	56	60	63
on the	27th	20th	20th	30th	26th	13th

Lowest	...	30	...	30	...	32	...	43	...	41	...	49
on the	...	17th	...	19th & 29th	...	1, 12 & 15th	...	1st & 20th	...	7th & 8th	...	8, 11 & 12th
Wet Mean	...	37	...	35	...	37	...	44	...	47	...	52
Highest	...	49	...	44	...	51	...	52	...	57	...	58
on the	...	27th	...	20th	...	20th	...	30th	...	26th	...	15th
Lowest	...	30	...	28	...	31	...	38	...	40	...	47
on the	...	16th	...	19th	...	1, 12 & 15th	...	9th	...	7th & 8th	...	8, 11 & 12th
Terrestrial Mean	...	30	...	30	...	31	...	35	...	39	...	44
Highest	...	40	...	40	...	44	...	45	...	39	...	50
on the	...	28th	...	22nd	...	21st	...	29th	...	17th	...	15th
Lowest	...	20	...	20	...	21	...	28	...	27	...	35
on the	...	22nd	...	29th	...	12th	...	12th & 19th	...	20th	...	28th
12° below Surface	...	38	...	38	...	39	...	44	...	50	...	54
Mean	...	41	...	40	...	43	...	48	...	53	...	57
Highest	...	29th	...	1st & 22nd	...	21st	...	29th	...	27th	...	30th
on the	...	36	...	36	...	36	...	40	...	46	...	52
Lowest	...	1, 2, 17, 18, 25, 26th	...	17, 18, 19, 28, 29th	...	2, 3, 4, 5, 6 & 7th	...	1st & 2nd	...	9, 10 & 11th	...	1, 8, 9, 10 & 12th
on the	...	49	...	49	...	55	...	71	...	75	...	75
Bright Mean	...	64	...	65	...	71	...	80	...	92	...	98
Highest	...	28th	...	21st	...	23rd	...	25th & 30th	...	27th	...	13th
on the	...	36	...	41	...	40	...	57	...	52	...	56
Lowest	...	2nd	...	5th & 29th	...	5, 6, 7 & 8th	...	16th	...	9th	...	12th
on the	...	...	...	...	...	...	...	...	...	...	...	...

In Vacuo—

Bright Mean	...	49	...	49	...	55	...	71	...	75	...	75
Highest	...	64	...	65	...	71	...	80	...	92	...	98
on the	...	28th	...	21st	...	23rd	...	25th & 30th	...	27th	...	13th
Lowest	...	36	...	41	...	40	...	57	...	52	...	56
on the	...	2nd	...	5th & 29th	...	5, 6, 7 & 8th	...	16th	...	9th	...	12th

Dark Mean	...	61	...	64	...	78	...	104	...	105	...	109
Highest	...	83	...	94	...	104	...	119	...	133	...	124
on the	...	28th	...	29th	...	23rd	...	25th	...	4th	...	17th
Lowest	...	38	...	47	...	46	...	77	...	66	...	66
on the	...	2nd & 9th	...	5th	...	15th	...	16th & 23th	...	28th	...	12th
Total Rainfall	...	1.17	...	2.40	...	1.45	...	1.18	...	3.16	...	1.92
Most in 24 hours	...	.22	...	.45	...	.26	...	.85	...	1.00	...	.84
on the	...	14th	...	1st & 4th	...	1st	...	15th	...	28th	...	25th
Days on which rain fell	...	14	...	21	...	20	...	15	...	16	...	14
Wind	...	No. of Days	Average Miles per hour									
N. ....	...	...	...	...	...	1	...	6.21	...	...	...	1
N.E. ....	...	1	...	4.57	...	2	...	5.90	...	3	...	5.75
E. ....	...	...	...	...	...	...	...	...	...	...	...	...
S.E. ....	...	...	...	...	...	...	...	...	...	...	...	...
S. ....	...	5	...	9.74	...	1	...	10.00	...	1	...	5.08
S.W. ....	...	10	...	11.63	...	4	...	9.83	...	2	...	10.34
W. ....	...	3	...	10.61	...	2	...	18.60	...	8	...	9.34
N.W. ....	...	2	...	9.20	...	...	...	...	...	4	...	14.54
No Wind	...	10	...	...	...	3	...	7.38	...	7	...	22.35
	...	...	...	...	...	15	...	...	...	7	...	...
	...	...	...	...	...	20	...	...	...	11	...	...

*The Instruments are placed in a Field to the West of "Ashgate," Lintborne, with the exception of the Barometer which is in the Hall and is 48 feet above O.D. The Records are taken at 9 a.m. each morning.

*METEOROLOGICAL RECORD, AT LINTHORPE, MIDDLESBROUGH, IN 1904.

By C. LOWTHIAN BELL.

1904.

MONTH

JULY

AUGUST,

SEPT.

OCT.

NOV.

DEC.

BAROMETER Av.

Highest	...	29.968	...	30.037	...	30.031	...	29.905	...	29.815
on the	...	30.353	...	30.338	...	30.513	...	30.507	...	30.591
Lowest	...	18th	...	18th	...	13th	...	14th	...	19th
on the	...	29.686	...	29.740	...	29.273	...	29.293	...	28.816
	...	1st	...	14th	...	6th	...	22nd	...	12th

THERMOMETER Max.

Mean	...	69	...	62.9	...	57.3	...	47.6	...	43.8
Highest	...	76	...	72	...	65	...	57	...	59
on the	...	16th	...	6th	...	21st	...	5th & 6th	...	17th
Lowest	...	59	...	56	...	48	...	35	...	30
on the	...	27	...	25th	...	8th	...	27th	...	22nd & 26th
Min.	...	49	...	45.5	...	40.1	...	36.0	...	32.8
Highest	...	—	...	57	...	54	...	51	...	44
on the	...	19th	...	11th	...	19th	...	4th	...	1st
Lowest	...	40	...	35	...	26	...	21	...	19
on the	...	19th	...	19th & 20th	...	15th	...	26th	...	9th
Dry Mean	...	—	...	55.6	...	48.0	...	41.0	...	34.0
Highest	...	—	...	64	...	58	...	57	...	50
on the	...	—	...	5th	...	17th & 19th	...	9th	...	4th, 16th & 17th
Lowest	...	—	...	46	...	36	...	30	...	22
on the	...	—	...	28th	...	23rd	...	26th	...	22nd

Wet Mean ...	...	55.6	...	52.0	...	45.6	...	32.0	...	37.1
Highest	—	66	...	59	...	56	...	54	...	53
on the	—	4th	...	5th	...	17th & 19th	...	9th	...	17th
Lowest	—	50	...	45	...	30	...	29	...	23
on the	—	17, 21 & 22nd	...	28th	...	14th	...	26th	...	22nd
Terrestrial Mean ...	48	44.6	...	39.9	...	35.3	...	31.1	...	27.2
Highest	59	56	...	54	...	49	...	49	...	43
on the	24th	5th	...	6th	...	21st	...	5th	...	6th
Lowest	37	34	...	30	...	22	...	17	...	15
on the	19th	25th	...	20th & 21st	...	13th & 15th	...	26th	...	9th
12in. below surface }	59	57.7	...	54.1	...	48.9	...	43.0	...	39.5
Mean	...	...	...	...	...	...	...	...	...	...
Highest	61	62	...	58	...	52	...	49	...	44
on the	14th & 16th	5th	...	1, 2, 3 & 6th	...	1st	...	4th	...	5th
Lowest	57	54	...	51	...	45	...	38	...	37
on the	2, 3, 4th & 5th	24th & 25th	...	28th	...	16th	...	26th to 29th	...	22nd to 28th
IN VACUO										
Bright Mean ...	87	113.1	...	111.5	...	91.1	...	71.4	...	48.1
Highest	96	129	...	125	...	110	...	98	...	67
on the	10th	31st	...	7th	...	2nd	...	6th	...	2nd
Lowest	70	72	...	95	...	59	...	43	...	31
on the	26th	23rd	...	25th	...	30th	...	28th	...	14th
Dark Mean ...	120	82.3	...	79.0	...	67.9	...	54.1	...	60.2
Highest	134	97	...	89	...	78	...	72	...	91
on the	7 & 18th	31st	...	6th	...	18, 19 & 21st	...	4th	...	2nd

Lowest	...	76	...	58	...	69	...	52	...	37	...	33
on the	...	28th	...	23rd	...	25th	...	30th	...	28th	...	26th
Total rainfall	...	1.88	...	2.35	...	1.16	...	0.71	...	2.00	...	1.98 in.
Most in 24 hours	...	0.48	...	0.24	...	0.47	...	0.25	...	0.57	...	0.58 in.
on the	...	28th	...	5th	...	25th	...	1st	...	8th	...	8th
Days on which rain fell	...	13	...	13	...	9	...	8	...	16	...	17

Wind

	Av. Speed	Days	Av. Speed						
--	-----------	------	-----------	------	-----------	------	-----------	------	-----------

N.	...	—	...	1	5.53	1	8.40	1	3.00	2	11.4	—	
N.E.	...	1	7.20	3	6.53	3	6.53	—	—	—	—	1	4.80
E.	...	—	...	—	..	..	..	—	—	—	—	—	—
S.E.	...	—	...	—	—	2	5.70	—	—	—	—	—	—
S.	...	2	6.18	2	8.60	1	9.70	1	4.30	—	—	—	—
S.W.	...	10	7.51	8	8.64	10	7.85	3	6.73	7	6.90	9	10.47
W.	...	1	5.14	6	7.43	..	..	2	9.65	3	4.40	—	—
N.W.	...	2	4.15	2	5.27	2	6.00	2	8.25	1	11.20	3	33.12
No wind	...	15	...	12	—	11	—	22	—	17	—	18	—

CLEVELAND NATURALISTS' FIELD CLUB.

SECRETARY'S REPORT FOR 1903-4.

In presenting to the members my SIXTH ANNUAL REPORT it is once more my pleasing duty to record that the work of the Society during the past twelve months has been quite as successful as during any previous period of the Club's existence. Summer and Winter Meetings have been held regularly.

Before giving my Report in detail it would perhaps be interesting to preface my remarks by informing you that, on referring to the First Minute Book of the Club. I find that this is the 23rd year of the Club's existence since organised as the Cleveland Naturalists' Field Club, the Club being established at a meeting held in the "Lit. and Phil.," on April 4th, 1881. During the first year the Club appears to have had 72 members. Of these 16 are at present members, and 4 who attended the first meeting are members of the Committee, 3 of them still taking an active part in the work of the Club. The Club during its first year of existence held both summer and winter meetings, and also published a handbook of Middlesbrough and district for the use of the members of the British Association, who visited the district in the autumn of 1881.

SUMMER MEETINGS.—The programme arranged for the summer months provided for 8 meetings, exclusive of the Yorkshire Naturalists' Union meetings. The whole of the meetings were held, and when the weather was anything like fine there was generally a good attendance. During the whole of the summer months, however, the weather was exceptionally cold and unsettled, and it materially interfered with the attendance at two or three of the meetings. At several of the meetings members of the Club or others acquainted with the localities to be visited kindly assisted in arranging the programme and also acted as guides, which arrangement added very greatly to the interest and value of the outings. I hope that more members will assist in this, and it would also be a great assistance if a few of the members would undertake to be responsible for the arrangements of, say, one meeting each during the summer.

The first meeting of the season was held on Saturday, May 2nd, to Dinsdale, for the purpose of visiting the woods, &c., on the banks of the Tees, and the old Churches at Dinsdale and Sockburn. The weather for some days preceding having been very unsettled and wet, and the outlook on the day not being very promising, no doubt accounted in a great measure for the small number (6) who took part in our first outing. As it happened, those who attended were well repaid for the risk taken, as the afternoon was fine and warm, the walking was good, and the outing generally was a particularly interesting and enjoyable one. The party, on arrival at Dinsdale Station about two o'clock, walked from there through the woods to the Spa and along the Durham banks of the Tees to Dinsdale Church. (It was noticed *en route* that a great many trees had been or were in process of being felled in these woods, which will tend to destroy the beauty of this part for some time to come.) The Church appears to be mostly of recent date, what old remains having been very much restored; the old part remaining—*i.e.*, the Nave, Arcade, and a few stones near the base of the Nave walls—being apparently the only remains of the Church erected about 1196, this church being, according to historians, on the site of a former Saxon Church.

In the Church were noticed a Norman Font (plain circular), a rather fine Grave Cover of *Hog-backed* fashion, and a Memorial Brass with Wivill Coat of Arms on, dated 1668. In the Porch walls were built in some remains of Pre-Conquest Crosses and an old Grave Cover with fine floreated cross carved on and an inscription to one of the Surtees family. In the Churchyard was a Stone Sarcophagus in rather good preservation, and dating probably from about the 12th century. After leaving Dinsdale Church the party crossed the Tees, and walked through the fields on the Yorkshire side of the river to Girsby, a small out-of-the way village pleasantly situate on the banks of the Tees. Very fine views of the river and surrounding country were obtained all along the route from Dinsdale to Girsby. The River Tees was again crossed at Girsby, and after walking a short distance Sockburn Hall was reached, a modern building erected on the site of an older building, very pleasantly situate at the southern point of a big bend of the Tees. In the grounds are the remains of Old Sockburn Church, for which permission to visit had kindly been granted by W. H. Williamson, Esq., the present occupier of the Hall. The Church, which is very much in ruins, is

principally of the Early English period. The owner of the estate, Sir Edward Blackett, has had a portion of the ruins covered in for the purpose of protecting the extensive remains of Pre-Conquest Crosses, Grave Covers of *Hog-backed* fashion, Sepulchral Remains of Anglican Crosses, etc., and a very fine Mailed Effigy of a Conyers of the early part of the 14th century, and some Memorial Brasses of the same family.

Sockburn originally belonged to the Conyers' family, one of whom, Sir John Conyers, a Knight of the 11th century, is said to have slain a large "WORM" or serpent which infested these parts, and to have received the Estate as a reward, on the tenure of his rendering up his Victorious Sword to every new Bishop of Durham entering at this point. The Sword or Falchion is at present in the possession of the Owner of the Estate, Sir Ed. Blackett, of Matfen.

After looking over the many objects of interest at Sockburn, the party returned to Dinsdale Station along the Durham side of the river by way of Neasham. During the afternoon a number of plants were noticed in flower by the Botanists, but not so many as are usually noted at this season of the year, on the occasion of our first outing. Foliage was very well forward up to the first week in April, but after this it received a very severe check, hard frost in many cases having killed the foliage entirely, and the blight generally has been the means of keeping many plants back that would have been well on but for this

No insects of any moment were noted by the Entomologists of the party. With regard to Birds the Spring Migrants were not very prominent, the only one noticed in abundance being the Willow Wren. The Sand Martin was seen, and the Cuckoo and Tree pipit heard. Resident Birds seemed to be busy nesting, and a Yellow Hammer was flushed from a nest containing three eggs.

The Club were indebted to Mr. H. Hylton Taylor for information supplied with regard to the route, and to W. H. A. Williamson, Esq., and Rev. E. H. Greatorex for permission to visit the Churches of Sockburn and Dinsdale.

KILDALE TO HUTTON.—At the meeting held at Kildale on Saturday, May 16th, there was a good attendance, upwards of 25 being present, including members from Middlesbrough, Redcar, Ingleby, Whorlton, Ayton, Stockton and Nunthorpe.

The afternoon kept fine, although it was threatening, especially in the early part, and this no doubt kept some of our members from attending. The party on arrival at Kildale were met by the President of the Club, the Rev. J. Hawell, M.A., who conducted them over some of the most interesting ground (of geological interest) in the immediate neighbourhood, giving a description of the most prominent features. Among the places visited were a filled-up pool, in the Kildale *Moraine*, in which he (the Rev. J. Hawell) had bored some 30ft. through fresh water shells, etc. The old ironstone workings were also examined near Kildale Station, and from this point the various geological and physical features of the surrounding country were commented upon by Mr. Hawell. Before leaving Kildale the archæological features of interest were examined in Kildale Church and Churchyard. These included two old Fonts, probably early Norman and Early English respectively. These are lying about exposed in or near the Churchyard. In my opinion, it would have been much better if one of them, at any rate, had been used in the new Church, instead of being thrown outside and left exposed to the weather. It is a great pity that more respect has not been paid in the past to old Fonts and other Church fittings which have, no doubt, been of great service to past generations. A few remains of an Early Church were noticed scattered about the Churchyard, and there were also some Crosses (consecration?) built into the Porch walls, and a little zigzag ornament, which may have been the remains of a Norman Church. In the Porch were several Gravestones bearing the Arms of the Pereys (formerly Lords of the Manor). I should be glad if some member would give a detailed description of these and the other remains, and also of the Danish Bronze and Iron Weapons which were discovered when excavating for the present Church (and which, I believe, are in York Museum), for our Proceedings.

After investigating the ironstone workings a portion of the party walked over to Hutton, by Sleddale, as outlined in the programme, but the bulk of the members walked over by *Percy Cross* (only the stump of which remains), Sleddale being viewed *en route*.

Very little of interest was noted by the Ornithologists, Entomologists, and Botanists of the party. The afternoon being dull and rather cool, Birds and Insects were conspicuous by their absence, and the continued cold weather has kept all plant life very backward.

BOOSBECK TO GUISBOROUGH.—On Saturday, June 6th, a meeting was held at Boosbeck. Owing to the inconvenient train service members had to leave Middlesbrough at 12-55, and this no doubt militated against a good attendance, for though the afternoon was quite fine (although cool) under a dozen attended

The party on arrival at Boosbeck walked by a path through the fields to Slapewath, investigating the woods, etc., *en route*. At Slapewath the members who came by a later train were met, and tea was taken at the inn there. Wiley Cat Wood, the moors above and the woods along the hill side to Guisborough were investigated, but although the ground looked promising very little work of any moment was done by any of the party investigating. Only some 50 species of plants or so were noticed in flower by the Botanists, a very small number for this period of the year, but no doubt this is accounted for by the long-continued occurrence of Easterly and Northerly winds. Very few insects were noticed by the Entomologists for similar reasons, only a few odd specimens being taken, including *T. biundularia*, *Eupithecia indigata*, and *lariciata*, *A. myrtilli*, and a single larvæ of *Agrotis agathina* about half grown, taken off the heather.

The Club were indebted to Mr. Garbutt, of Kilton Mill, for giving us an outline of the best route to follow from Boosbeck.

The district between Guisbro' and Slapewath is well wooded and the Wiley Cat and Waterfall Woods, would probably well repay working at a little later period.

CARLTON, SWAINBY.—The weather just previous to this meeting, held at Carlton, on June 20th, being very cold and unsettled no doubt prevented many members from securing wagonette accommodation and attending this meeting, however, the day turned out fine and a party of about 21 members and friends attended, some of the members travelling to Carlton by Wagonette, others by rail and one or to by bicycle; the party, on arrival at Carlton, about 3 o'clock, were met by Mr. Harries, of Carlton, and had the advantage of his local knowledge, he acting as guide and conducting the party, some of the members, under his guidance, proceeded up Carlton Bank to a Quarry with a view to securing some fossils but were not very successful, from there the party proceeded to *Bryant's Pond*, which is surrounded by a moss of some extent, the Botanists' here found, among other interesting plants, the

Sundew (*Drosera rotundifolia*), leaving *Bryant's Pond* a descent was made into the valley to examine some old jet workings and many signs of jet were found although of poor quality, from here the party walked across the heath down into Snotterdale, and from thence into Scugdale, eventually arriving at Swainby.

The thanks of the Club are due to Mr. Harries, of Carlton, for information as to route and for kindly acting as guide, also to the Rev. J. C. Fowler, for information with regard to the locality. I have to thank Mr. Sachse for assistance rendered in carrying out this meeting.

LOFTUS.—The meeting fixed to be held at Carlin How, on July 6th, was attended by upwards of 15 members and friends, but owing to the party going on to Loftus instead of Carlin How, they missed the gentleman (Mr. Garbutt) who kindly came to meet the party and give them the benefit of his local knowledge with regard to route, etc.

On arrival at Loftus a section of the party went over a portion of the route outlined on the programme, viz.: from Loftus to Rockliffe and, the day being fine, they no doubt had an enjoyable and instructive outing.

Several of our members and some friends journeyed to Loftus by an earlier train and walked from there to Kilton Woods, working the locality for Lepidoptera, but although the afternoon was fine and favourable, insects were not at all plentiful, even common species, and no new species were added to the list for this locality.

LEALHOLM-GLAISDALE.—The sixth meeting of the season was held at Lealholm, on Saturday, July 18th, the route being from Lealholm to Glaisdale, over ground specially interesting to all who have followed up the Cleveland Glacier Lake system as described by Mr. Percy, F. Kendall, F.G.S., and our President, the Rev. J. Hawell.

The weather being cold and threatening at Middlesbrough, and coming after a very cold week, it no doubt deterred many members from attending and it was perhaps surprising, under the circumstances, that the attendance was so good, there being 14 members and friends present; unfortunately the Rev. J. Hawell was prevented from attending owing to clerical duties in Bilsdale, and another of our members who was well acquainted with the route and promised to attend, failed

to put in an appearance; this rather left us in a dilemma as to the route, however, by the aid of maps in the possession of Rev. J. C. Fowler and Mr. Simpson, and with assistance the obtained from the "natives" we were able to trace out the principal features as outlined in the programme; but owing to the mist and drizzle it was not possible to obtain a fine view of the district. Very little work was done by any of the members owing to the miserable state of the weather. The route seemed to be a very interesting one, and it would be well to repeat the meeting at some future time, when it is hoped that better fortune will await us both as regards weather and guides.

INGLEBY GREENHOW.—A party of 15 took part in the meeting held at Ingleby Greenhow on Saturday, August 20th, when the afternoon being fairly fine (although threatening as usual) and having the advantage of our President, the Rev. J. Hawell, as guide on ground with which he is naturally well acquainted, the outing proved to be a successful one. The route taken by the general party was along the Rosedale Railway as far as the incline foot, from thence into "Midnight," and back across the fields to Ingleby Greenhow. Some interesting plants were obtained by the Botanists, one or two being, I understand, particularly noteworthy. Mr. Hawell pointed out the various features of interest *en route*. Botton Head, the highest point in the Cleveland Hills, was viewed, but not ascended by any of the party to my knowledge.

Two or three of the members who were interested in Entomology, went up to the moors near "Turkey Nab" and worked the heath for one or two insects that it was expected might occur there, but without success, the afternoon being very windy and cool—the evening being worse, if anything—with the result that insect life was notable by its absence, a not unusual occurrence this summer.

YORKSHIRE NATURALISTS' UNION MEETINGS.—Members of the Club attended the Yorkshire Naturalists' Union meetings at Walshford Bridge, Filey, Goathland, and Bowes.

The only meeting held in our district—viz., Goathland, on June 27th—was attended by 7 of our members. The day being exceptionally fine, they had a very enjoyable and instructive outing, the Geologists being especially fortunate in having Mr. Percy F. Kendall as guide on ground with which he is very familiar and very widely known in connection with, through his able work on "The Glacier Lakes of the Cleveland Hills."

WINTER MEETINGS.— Five meetings were fixed for the Winter Session, four of which have already been held. There has been a good attendance of our members at all the meetings, especially seeing that the weather on three out of the four nights was of the worst description, we seeming to be singularly unfortunate in this respect.

The first meeting was held in the Literary and Philosophical Society's Hall, on Saturday, November 7th, when a paper was given by *Mr. T. W. Woodhead, F.L.S.*, entitled "*Natural History of Water Plants.*" The Lecture was open to Lit. and Phil. members, and a fairly large audience attended (especially so having regard to the state of the weather, the night being very foggy and cold), our members being very well represented, members attending from Redcar, Saltburn, Stockton, Middlesbrough, etc.

The Lecturer traced the history and development of water plants from primitive forms, and gave very graphic descriptions of the development of certain plants, illustrating their adaptation to circumstances, their means of propagating their species, etc., under often very adverse conditions.

The paper was illustrated by means of Lantern slides, some of which were exceptionally fine.

The Lecture being one of the Y.N.U. series, the Lecturer at the conclusion laid before our members and others the desirability of supporting the Union by becoming members, and thus further the aims and objects of the Union in exploring and publishing the various fauna and flora of the County. A vote of thanks was proposed by the President of the Lit. and Phil. (Mr. F. H. Marshall), seconded by our Vice-President (Mr. T. F. Ward), and carried unanimously.

On December 3rd the *second* Lecture was delivered by Mr. Percy F. Kendall, F.G.S. (ex-President Y.N.U.), his subject being entitled, "*Early Man and his Relation to the Ice Age.*" There was a good attendance of our members, and the paper proved to be a most instructive and interesting one. It was well illustrated by means of a good series of slides. Mr. Kendall traced the succession of races of man in the South of England by means principally of the flint and metal instruments used in the chase, beginning with the iron and bronze weapons and tracing backwards to the very rudest form of flint arrow heads. He also treated on the course of events

during the Ice Age, the growth of British Glaciers and their Confluence with the Scandinavian Ice Sheet, Invasion of the East Coast of England by the Ice Stream from the North Sea, the Limits of the Ice, Paleolithic Man and the Associated Animals, Occurrence of Remains in River Gravels and in Caves, Geographical Distribution and Relations to the Glacial Deposits.

At the conclusion of the Lecture a vote of thanks was proposed to the Lecturer by the President of the Literary and Philosophical Society (Mr. F. H. Marshall), seconded by our President (the Rev. J. Hawell), and carried with acclamation.

The Club are indebted to the Rev. J. Hawell in a great measure for inducing Mr. Kendall to come over and give us this Lecture.

The Third Winter Meeting was held on February 4th, 1904, at the Lit. and Phil., when a microscopical exhibition was given under the direction of Messrs. Hy. Simpson and J. W. R. Punch, who had the assistance of Messrs. Percy Hodges, A. E. Ward, and J. W. B. Wright.

Although the night was a very unpropitious one from a weather point of view, it raining as usual, and was altogether disagreeable, the attendance was much better than expected, there being well on to 30 members and friends present, members attending from Stockton, Eaglescliffe, Grangetown, Redcar, Saltburn, and Middlesbrough.

Microscopes were kindly lent by H. Simpson, J. W. R. Punch, J. Percy Hodges, J. W. B. Wright, A. E. Ward, T. F. Ward, R. Howson, Middlesbrough High School, Thos. Brown, J. E. Stead, Stevens, and objects by Mr. Simpson, including a trout fry and other living objects, and slides by many of the members, including a set of bacteriological slides by Mr. Hodges. Mr. S. Lithgow kindly supplied the lamps used for providing the requisite lighting to the microscopes.

A few members exhibited objects of interest, among them being Mr. C. Milburn, who exhibited a *Black Redstart* that had been taken at the Tees mouth recently, Mr. Simpson a Map of the North and East Ridings of Yorkshire published in 1610, with some very interesting notes as to the district at that period, Rev. J. Hawell and Mr. Punch specimens of a new fossil plant discovered near Marske by Mr. Hawell, and named after him (by Mr. Seward) *Lietyozomites Hawelli*. Mr. Punch also exhibited several other fossil plants, etc., from the same sect on as above. T. A. Lofthouse exhibited a case containing representatives of most of the British Thorn Moths, etc.

An exhibit of "*Radium*" by Mr. J. E. Stead, F.R.S., proved of great interest to all present.

The next meeting was held in the Literary and Philosophical Society's Hall, on March 16th, from 7 to 9-30, when a very fine series of slides was exhibited by *Mr. R. Barnes*, of Harrogate (formerly Head Gardener at Saltburn Pleasure Gardens, and well known to many of the members). The meeting was well attended, there being upwards of 25 members and friends present, and the meeting was one of the most successful of its kind held by the Club. The slides, which had all been prepared by Mr. Barnes himself, were exceedingly fine, not only as illustrating fully the development of Mosses and Ferns, but also to microscopists as examples of very skilful workmanship. Mr. Barnes explained the various slides to those present, and as we only saw a portion of his extensive series of slides, I hope to arrange for a further exhibition by him at some future winter meeting.

The best thanks of the Club are due to Mr. Barnes for kindly coming over from Harrogate and providing material for one of the most successful meetings held during the winter session. The Club were also indebted to Messrs. Simpson, Punch, Hodges, and others for assistance in arranging the slides, and also to the following for the loan of microscopes:—Mrs. C. Hood and Messrs. J. E. Stead, J. J. Burton, Thos. Brown, J. W. R. Punch, R. Barnes, J. W. B. Wright, J. Percy Hodges, M. L. Thompson, T. F. Ward, and H. Simpson.

As hitherto, the Lectures have been given voluntarily, the out-of-pocket expenses being paid by the Club, fees for lanterns, and the expenses in connection with printing and postages.

I should be glad to hear from any member who would work the Lantern for us, and save cost in this direction, which might be devoted towards holding one or two more winter meetings.

I should also be obliged to hear from members who are willing to contribute papers or arrange meetings for the new Winter Session as soon as possible, as it would be a great advantage to have the dates fixed at the beginning of the season.

COMMITTEE MEETINGS.—During the year eight Committee meetings have been held, with an average attendance of six.

We are again indebted to the Council of the Cleveland Literary and Philosophical Society for permission to use their rooms both for Winter Meetings and Committees.

MEMBERSHIP.—The Club has a membership of 114, this being about the same as last year. Twenty new members have been elected, one of whom has since left the district. During the year several members have resigned or left the district, two have died, and some have had to be struck off owing to non-payment of subscriptions.

It will perhaps be interesting to know that we have members at present in the following places:—Middlesbrough, Eaglescliffe, Nunthorpe, West Hartlepool, Redcar, Saltburn, Ingleby Greenhow, North Ormesby, Ormesby, Great Ayton, Stockton, Carlin How, Darlington, Stokesley, Whorlton, Marske, Normanby, Guisborough, Boosbeck, and Grangetown.

The Rev. J. Hawell and one or two other of our members have been the means of adding to our membership during the year, and I am quite sure if all members had done what they could in this direction that we would have had a very material increase on last year, in place of being practically the same.

The two members who have died during the past twelve months were both prominent supporters.—*Mr. R. G. Clayton*, who died suddenly in June last, was at the time a member of your Committee and also Secretary of the Ornithological Section. He was a keen Naturalist and an active worker for the Society, being a frequent attender at the meetings, and having contributed a good deal of material to the proceedings during past years.

Mr. Angus Macpherson, who died in the early part of this year, had been a member of the Society since its formation, and served three years as President, viz.: in 1886, 1887 and 1894. He for many years was a regular attender at our meetings, but latterly owing to stress of work he had only attended very occasionally. The Club were frequently indebted to him for papers at the Winter Meetings, the last occasion being in December, 1902, when he gave a very interesting paper on Rome. He was well known and greatly respected by all, and both he and Mr. Clayton are members who will be very much missed. Short obituary notices are included in these Proceedings.

BOTANICAL SURVEY.—Since our last Annual Meeting I have received some copies of a paper on *Botanical Survey* for Local Naturalists' Societies, by Dr. Smith, of the Yorkshire College, Leeds, to which I should like to call the attention of all interested in the plant life of the District, and I trust some of our members will assist in this work which is being taken up by members of other Societies in other parts of Yorkshire. Quoting briefly from the paper, I may state that "the first step in the case of starting a record is to select a place where the vegetation is fairly uniform, for example, a wood, a portion of a moor, or some swamp. The size of the area is of minor importance, although there are many advantages in having it as large as possible—say, at least an acre. The identification of the place should be ensured by colouring it on a 6-inch Ordnance Survey Map. For each Plant—Association dealt with there should be a record book, suitable for carrying and using out of doors.

Each worker may begin with one association and extend his operations. This may be done either by recording associations quite distinct in character (*e.g.*, a moor, a wood, or a marsh), or by comparing different areas with similar vegetation (*e.g.*, several oak woods).

The scheme aims at more than mere identification of plants, it will train in observation on the social conditions of life in plants. Common plants in time become familiar not only by their flowers, but by their leaves and other organs, and the winter *period* will furnish material for observations quite as interesting as the summer. After an association has been carefully studied, it would form a suitable topic for a paper to the Society." I should be glad to supply any of our members interested with copies of the Paper.

I have also received from the Secretary of the Durham County Naturalists' Union a Record Book for the use of Field Clubs, which is intended for working districts according to the Botanical Survey method, but they suggest not only recording the plants of the particular area investigated, but the geology and the whole of the Fauna.

I should be pleased to hand the Record Book with the instructions to any member or members who would be willing to make a trial of it during the coming summer.

LIBRARY.—The following Works have been added to the Society's small Library during the year, Vol. II and Vol. III, Part 1 of the Hull Society's Proceeding, presented by the Society; The County Naturalists' Record Book, presented by the Durham County Naturalists' Union; The Naturalist for 1903, and the Yorkshire Naturalists' Union Transactions, Parts 24, 25, 28 and 29; Derwent Naturalists' Field Club Publication, Vol. II and IV. SL

DISTRICTS OF CLEVELAND.—At the last Annual Meeting I suggested that it would be worth the consideration of the Society as to whether it would not be advisable to divide the Cleveland district into 4 or 5 divisions, and during the summer months hold a meeting in each division, and that some member should take one of the divisions and make all necessary arrangements as to programme, route and guides, and personally attend the meeting. This would enable more members to take an active part in the work of the Society. Nothing definite was decided as regards this, although the meetings held last year were arranged so as to cover each portion of Cleveland as far as possible.

MICROSCOPY.—With regard to the *Microscopist Section*, the members of this Section, especially Messrs. Simpson and Punch, have rendered great assistance at two of the meetings held during the winter, and it has occurred to me, seeing the great interest that has been taken in these meetings, whether it would not be worth while this Section considering the practicability of holding meetings in the winter months for the purpose of furthering the study of Microscopy and comparing and assisting one another as regards methods of working, &c.

PHOTO SURVEY.—I should be glad if some of our members would take up the question of a *Photographic Survey* of the Cleveland district, and by this means record all features of interest both Physical, Geological and Archæological. We have a number of members who are Photographers, and if each contributed 3 or 4 Photographs a year, we would soon have a good number of Records for the Cleveland district. These should be placed in an Album or albums, which would be placed in the Society's Library and be accessible to members. This is a most important subject and is being taken up by many Societies in other parts of the country; a Record of the Physical and Geological features, of the remains of Archæological interest, and also Customs still lingering in out of the way country

places, is of the utmost importance in these times, when towns are making such rapid strides and obliterating prominent features of interest so rapidly, they would be invaluable to students and others in years to come; it is also valuable in regard to the River and Sea Coast, and would show in future years if any alteration had taken place through the deep dredging and reclamation works that take place in the river, and by the ravages of sea and weather, and in regard to Archæological objects by weather and also through human agency.

The thanks of the Club are again due to Messrs. Punch, Ward, Sachse and F. Elgee for having had part of the notices of meetings distributed, and by this means saving the Club a considerable sum in postage. I hope they will continue to assist in this way and also that some more of our members will volunteer assistance in this direction. We are also indebted to the *Press* for notices of our meetings printed from time to time, and also to the North Eastern Railway for the special privileges granted to our members by them.

In conclusion I have pleasure in acknowledging the great assistance rendered me by my Co-secretary, Mr. Frank Elgee, also by the President, the Rev. J. Hawell, and other members for assistance and help at various times, and I trust that all members of the Club will in future support and further the interests of the Society by extending its membership, by contributing matter for its proceedings, and by assisting in the carrying out of the arrangements for Summer and Winter Meetings.



Previous numbers of the Proceedings of the Cleveland Naturalists' Field Club can be obtained of the Hon. Secretary, Mr. T. A. Lofthouse, 62, Albert Road, Middlesbrough.

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MEMBERSHIP.

Any persons interested in the work of our Society are invited to become Members, even if they are not able to be active Members. Their support would be valuable and would also show that the work of the Society was not altogether unappreciated.

The Annual Subscription is 5/-. Further particulars would be supplied by the Hon. Secretary.



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FIELD CLUB

1905-06.

VOL. II. PART II.

Edited by the Rev. J. Cowley Fowler, B.A., F.G.S.

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(FREE TO MEMBERS)

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15 JUN 29



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INGLEBY MANOR.

J. W. Brotton.

NOTES BY THE LATE REV. J. HAWELL, M.A., F.G.S.

Extracted from "*The Stokesley and Ingleby Greenhow Magazine*," 1887-1902.

Some time ago, a lady in Stokesley kindly lent me several bound volumes of "*The Stokesley and Ingleby Greenhow Parish Magazine*," containing many contributions during a series of years, beginning with 1887, from the versatile pen of the late Rev. J. Hawell, M.A., F.G.S., Vicar of Ingleby.

We are now publishing the greater part of these little essays in our "*Proceedings*," omitting some of the papers which related to the Lake District, Buxton, etc.

In these writings we get a glimpse of the many-sided mind of our late friend, whose death was such a loss to the Field Club and to the neighbourhood generally.

We may say that nothing came amiss to Mr. Hawell in the domain of Nature—animate or inanimate alike, and with his years grew his enthusiasm.

We might imagine him saying, as Thomas Edward, the Scotch Naturalist, said of himself: "Every living thing that moves or lives, everything that grows, everything created or formed by the hand or the will of the Omnipotent, has such a fascinating charm for me, and sends such a thrill of pleasure through my whole frame, that to describe my feelings is utterly impossible."

As a palæontologist he shone most of all, and was an expert at cataloguing—a thing requiring an immense knowledge of genera and species, the varieties in species being often so minute and perplexing, even to the scientific mind.

The great facts of nature in which he revelled do but recall the saying of Agassiz, that scientific systems are but translations into human language of the thoughts of the Creator. And so Mr. Hawell always felt in his labour of love, peopling the vast geological ages with forms and organisms (once more almost living to his active imagination). Botany also had a charm for

him, and he was always ready for an antiquarian ramble or a controversy about words and folklore. But, it must not be imagined that he was any the less alert in regard to his duties as a Parish Priest, which office he admirably fulfilled, and his study of Nature and cast of mind made him a scientific theologian, ready to discuss matters of abstruse and deep meaning in that mysterious realm, which he did at times, with the usual force of his character and powerful mental grip.

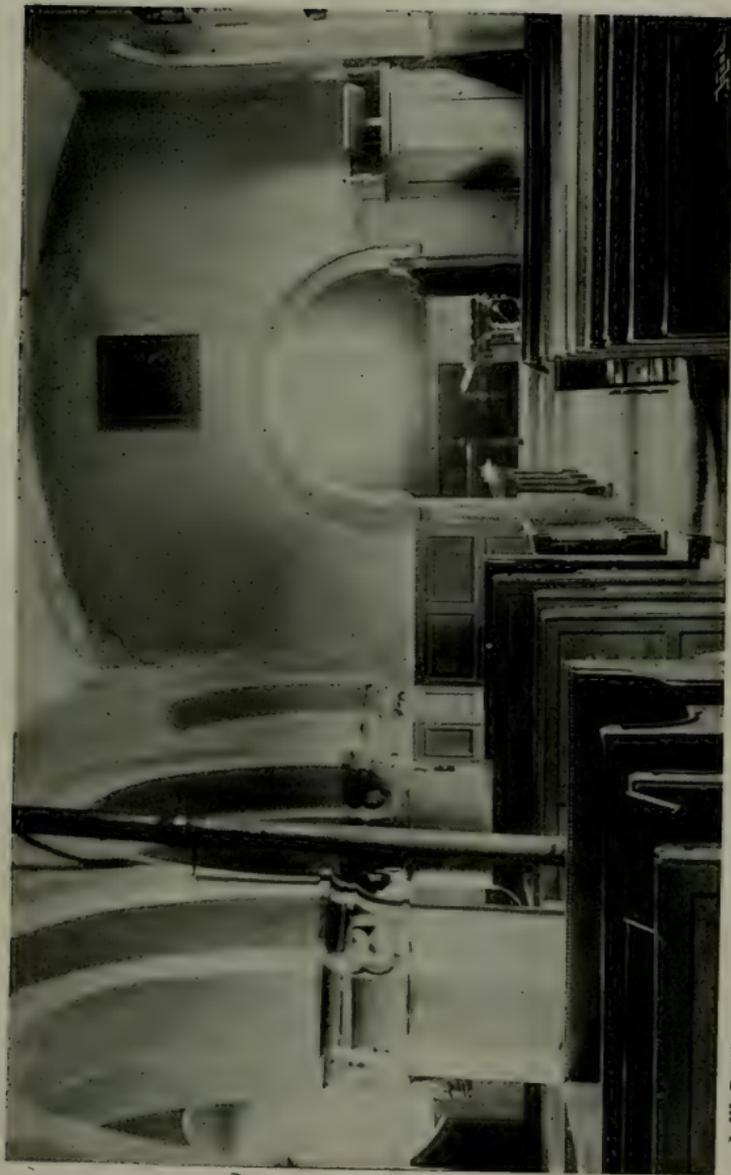
We trust the members of the Field Club will appreciate these extracts, entombed as they are in such a humble literary production as a Parish Magazine, from which we have rescued them, so that they may again see the light, and add to the enjoyment of many who did not read them before.

Whorlton Vicarage,
April 6, 1907.

J. C. FOWLER.

JUNE, 1887. THE GLACIAL PERIOD.—Some time ago nearly 400 boulders, transported into our Parish during the Glacial Epoch, were examined by the Vicar, and notes and measurements made—more recently, specimens of the different kinds were forwarded to Dr. Crosskey, of Birmingham, Secretary of the Boulder Committee of the British Association. They have subsequently been examined by Professor Bonney, and also by Mr. Clough, F.G.S. The very valuable notes of these two distinguished Geologists have been forwarded to us. Dr. Crosskey says—“The collection of specimens you kindly forwarded is very interesting, and will throw important light on various problems of Glacial Geology. The specimens show the action of ice descending from the Cheviots and South of Scotland over your district. Another stream of blocks has been evidently (from your collection) brought down by the ice travelling on the East side of the Lake district, and the glacial work done by it has to be studied in relation to the Physical Geography of the district generally. Could, or could not, the ice-work of your district have been effected by glaciers filling the valleys, and pressing downwards, carrying the *debris* from the upper regions from which they started? This and many other kindred questions will be helped to a decision by such collections as you have sent.”

AUGUST, 1887. LIST OF INCUMBENTS OF INGLEBY GREENHOW.—Circa 1180, Reiner—“R.—Persona de Englibi” (Whitby Chartulary, 88). “Reinerii Clerici Sui,” (W.C. 55). “Reinero



J. W. Brolton.

ST. ANDREW'S CHURCH, INGLESBY (INTERIOR).
[BEFORE RESTORATION.]



Clerico" (W.C. 52). The date of Charter 55 is certainly not later than 1181; and the date of 52 certainly not earlier than 1143. From 55, it would appear that Reiner had been "Persona" (that is "Parson") when Ingleby Church was originally granted to Whitby Abbey, Circa 1211—"Adam Capellano de Ingleby" (Whitby Chart, 216). Circa 1300—"Vilks de Wrelton Capellan," (effigy in Ingleby Church). 1587—Henry Routre. 1590 (?)—1606 (?). John Blackburne. 1626 (?)—1631 (?). George Levingstonne. 1634 (?)—1680, William Boweston (elected as Registrar in 1653, and continued as such during the period of Cromwellian rule). 1680 (?)—1703 (?). Henry Mason. 1703—1710 (?). George Spencer, 1710(?)—1719, Peter Moone. 1722 (?)—1758, Samuel Hassel. 1758—1784, William Spedding. 1784—1795, William Pennyman Consett. 1795—1846, John Dixon. 1847—1859, John Fletcher. 1860—1870, Ralph Prowde. 1870—1880, Henry Toovey. 1880, John Hawell.

SEPTEMBER, 1887.—In our list of Incumbents last month we inadvertently omitted two. We hasten to rectify the omission now. They are both mentioned in Archbishop Gray's Register. The first was Michael, who was Rector in 1237:—"Michael Rectori Ecclesie de Lengeby". The other was Simon de Nevill, who, in May, 1248, was instituted "to the Church of Langheby, at the presentation of the abbat and convent of Wytteby." The spelling of Ingleby in these two cases is peculiar, and we had at first some doubts as to whether our Parish was really meant. But we now feel convinced that the inference that it is so, is correct. It is unfortunate that the Torre M.S. gives no list of Incumbents of Ingleby Greenhow, though one or two interesting notices of the Parish occur.

OCTOBER, 1887. THE TORRE M.S.—In the last number of the *Magazine*, we mentioned that it was unfortunate that the Torre M.S. gave no list of the Incumbents of Ingleby. Since then, that portion of the M.S. which relates to our Parish, has been printed in the *Yorkshire Post*. We were previously in possession of this extract, which is as follows:—"There is a Church or Chappell at Ingleby under Greenhow served by a stipendiary curate—Testamentary burials—25 Feb. A.D. 1505. Tho. Ayscogh gent. of Ingleby Greenhawe made his Will (proved ———) giving his soul to God Alm, St. Mary and All Saints', and his body to be buried in the Parish Ch. of Yngleby before the Ymage of St. Mary in ye n. side of the church. 29 Julii A.D. 1507, Edw. Ayscought of Greenhow made his Will (proved

17 Aug., 1507) giving his soul utsupra, and his body to be buried in ye Parish Kirk of Ingleby, near the buriall of his fader." The Askews appear to have been persons of some importance in the Parish in the 16th Century. In 1542, William Askew bequeathed £60 to the poor of the Parish, the interest of which is still annually paid to them.

NOVEMBER, 1887.—Mr. Hawell lectured to the Young Men's Society at Ingleby Greenhow on "The Christian Names, Surnames, and Place-Names of the Parish of Ingleby. He stated that Ingleby and Battersby were derived from two Danes, Ingialldr and Buthar. Greenhow from the natural "houe," or small round hill, near the centre of the township: Greenhow Bottom from O.N. "*botn*, a bottom, or depth," applied to the innermost recesses of a sea, or a dale: Farnsides from "*Fernes* (A.S.) a wilderness": Blue Mells from Gael, "*maol*, a hill." He regretted the unfortunate blunders in the names of places on the Ordnance Survey maps, such as "Tidy Brown Hill," for "Tarry Brown Hill," "Blue Bell Trough," for "Blue Mells." As these maps are put forth by authority, it is practically impossible to correct the mistakes, and interesting old names run great danger of being lost. He defined Barker as meaning a "tanner," and derived Hepburn from Hebburn-on-Tyne, Havelock from Dan. "*haf*, sea and *leik*, sport, an appropriate name for one of a race to whom the ocean "was a delight": Hoggart either from the Dutch, meaning "high-natured," or from the English, meaning Keeper of Hogs: Garbutt from "*gar*, spear" and "*bod*," envoy: Medd and Metcalfe from "*med*, reverence": Alonzo from "*hild* battle," (the name of the holy abbess of Whitby, signifying "battle-maid") and "*fun*s, vehemence," its genealogy being Hildefun, Ildefonso, Illefonso, Alfonso, Alonzo.

On November 4th, same year, Mr. Hawell lectured to the Young Men's Society above-named, on "The Earthworm, the Friend of the Farmer." He showed how worms excavate the ground: drain the soil and make it fertile: manufacture manure: carry it, and spread it: cover up stones, etc.: that if it be rightly estimated (but, for us it is certainly an over estimate) that 10 tons of earth are cast up by worms on each acre, then the farmers of the parish of Ingleby had to thank the poor despised worm for 70,000 tons of good manure every year. Some interesting facts were told about their nature and habits, and Mr. Hawell endeavoured to show that worms have played a most important part in the world.



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ST. ANDREW'S CHURCH, INGLEBY.
[BEFORE RESTORATION.]



In January, 1888, a Lecture to the Young Men's Society was given by Mr. George Markham Tweddell, of Stokesley, entitled "A glance at the History of Ingleby." The parochial history was reviewed from the earliest times to the latest, and some notice given of the families of Baliol, Eure, Meinill, D'Arcy, and Foulis, all of which have been connected with the parish. Mention was also made of the interest which the Abbeys of Whitby and Hexham and the Knights Templar of Westerdale once had in the parish. An extract given from the "Black Book" of Hexham was peculiarly interesting, as several of the old place-names of the parish occurred in it.

JUNE, 1890. Some curious Christian names. A review of "The Register Booke of Inglebye juxta Greenhow," which recently appeared in the *Athenæum* calls attention to some interesting matters relating to the parish. Some notice of one or two of these will perhaps not be unacceptable.

"From 1653 to 1659, Births, not Baptisms are registered. In those years, England was a Commonwealth, and the opinions of our lawgivers, combined with the legal advantages of such a course, caused the passing of a statute, entitled—"How Marriages shall be solemnized and registered, and also a Register of Births and Burials" During these seven years eighty-eight births are recorded. This was the precise time, if the novelist's view of history were correct, when we should find the largest crop of those strange theological names which go by the nickname—Puritan. It is, therefore not amiss to remark that there is not one among them which can fairly bear that character; Dinah, Esther, and Josias are the only ones which can, without hesitation, be attributed to the influence of the Old Testament. An examination of the remarkably good index with which the volume is furnished, leads to a like conclusion. There are, of course, a few names strange to our ears, the source of which is certainly not Holy Scripture, such as Bethalina, 1797; Heroina, 1684; Anastache, 1743; Pontia, 1664; Munday, 1544; and Merrill, or Merroll, which seems to have been a by no means uncommon name." Bethalina occurs but once, and about the name Bethalina Beagerie, there is a quaint euphony, which may be paralleled by another name in the Register, viz.:—"An Man." One would rather expect to find that the females bearing such names were village characters. The form Bethalina is extremely rare, but we take it to be one of the very numerous names for which we are debtors to the name of Aaron's wife Elisheba, which signifies, "God hath sworn." Other forms are Elizabeth, Eliza, Elspeth, Bessie, Betsy, Betty, Libby, Liza. Heroina, a

feminine of Hero, occurs as the name of a certain Heroína Foulis, of whom we have never met with mention in any pedigree of that family. Anastache is a name formed from the Greek word for the Resurrection, and has a somewhat Puritan flavour. The circumstances attending the occurrence of Pontia in the Register are to our mind more than a little amusing. To a certain Robert Ripplay there was born about mid-day on Jan. 10th, 1648, a daughter, who was baptized on Jan. 14th, by the name of Bridgett. It was the parson's custom at the time to enter all the names in Latin, but he had a difficulty about the Latinization of Bridgett—this “learned Theban,” as Sir Walter would have called him, knew, however, that “pons” was the Latin for a bridge, and was familiar with the Latin name Pontius in the Creed. Bridgett, however, struck him as being a *diminutive* form signifying apparently a *little* bridge. He, therefore, after writing the name Bridgett, put as an alternative “Pontia vel Pontiola” in the margin—the latter form being the Latin diminutive. Later on in 1664, he boldly put Pontia in his list of entries, and relegated Bridgett to the margin. Bridgett has, in reality, nothing in the world to do with *bridge*, but is a good old Irish name, coming from a Keltic root, signifying “strength.” Munday Williamson was very possibly born on a Monday. Merrill, or Merroll is a corruption of Muriel, which is said to signify Myrrh. The following is another Extract from the “Review alluded to on “Nicknames.” “The Ingleby juxta Greenhow Registers don't furnish many nicknames—one however, is curious. There was in the Parish, a highly prolific race of the name of Ripley, one branch of which for some generations went by the name of Ripley, alias Midnight. Entries regarding these people occur between the years 1669 and 1694. It would be interesting to know from what deed of darkness they acquired their second name.” The Reviewer has here fallen into the same mistake as a friend of ours, who, on reading the announcement of a Meeting to be held in this Parish, was much scandalised to observe that it was to be held at midnight. The fact is, that it is simply the name of a farmhouse in the Parish—the appellation was probably given to it on account of its sunless situation. We were indeed at one time under the impression that for a while, in the depth of winter, the sun did not shine upon it—and in fact Graves in his excellent “History of Cleveland,” indicates a place in Greenhow Bottom, which he describes as being in this predicament. We happened, however, to be calling at the house about mid-day on the 21st of December last, and found the sun's beams clearly striking it. But in an estate book of the date of 1764, kindly



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INGLEBY, NEAR THE CHURCH.



lent to us recently by the owner of the Ingleby Estate, we found that at that date (nearly a century later than the entries relating to Ripley, *alias* Midnight) the house was still standing on a site yet easily recognisable in a position upon which the sun would not shine in mid-winter. The nickname of Midnight appears to have stuck pretty close for the time, and almost to have superseded the original name, for in 1692 we have the entry of the burial of Thomas Midnight. But we have no evidence that the nickname survived in any degree to after generations, though the Ripleys came down to quite recent times. There was, apparently, at least one other Thomas Ripley living in the Parish at the same time, and this made the employment of the distinctive place-name of great utility. It is by no means uncommon even now, in the neighbouring dales and in other country districts in the North of England, especially in cases where men with the same christian and surname live near each other, to distinguish them by applying to each the name of his respective dwelling-place. We remember a similar case where there were two neighbouring hamlets named Middle Row and Far Row. The common surname was seldom mentioned, and we knew the owners of it as Middle Tommy and Far Tommy. We have here interesting survivals of what was once a common practice, or what a petrologist would term a "recurrence of phase." If in such cases as these there is confusion between two or three persons in a district bearing the same christian and surname, what must the confusion have been before surnames became general? It was necessary to distinguish between the many bearing the name of Robert or William or Henry. They could distinguish so far by writing, as they often did "Robert, the son of Robert," and still further, by writing "Robert, the son of Robert, the son of William, but carried further this mode of nomenclature became clumsy. And therefore, in addition to the patronymic surnames such as Robertson, Williamson and Harrison, it became customary to make use of the place-name. Thus, we get in the records of our Parish such names as Adam de (that is "of") Ingleby, William de Stokesley, Nicholas de Ayton. Later on, the *de* was dropped in most cases, and the name became William Stokesley, etc. Ripley itself is a name of the same kind, and amongst others in our Register will be found the following:—Aldus, Appleby, Appleton, Barton, Barwick, Bertley, Blenkarne, Bousfield, Bowes, Bradley, Braithwaite, Bushby, Carington, Castle, Charleton, Chilton, Clifton, Conssett, Cornforth, Craven, Cowtas, Croston, Dale, Denton, Dinsdell, Dinsley, Dousland, Douthwaite, Duffield,

Easby, Easton or Eston, Eden, Ellerby, Ewbank, Farnaby, Featherstone, Fintres (elsewhere Ventriss, signifying "five trees"), Flankland, Flintoft, Flinton, Fotherley, Fullerby, Galloway, Gatenby, Gill, Goulton, Grange, Greenside, Hackworth, Harlesey, Harrop, Hepburn (commonly written Hebbron), Heddon, Hill, Hornby, Howe, Hugill, Hutton, Kearsley, Kildale, Kirby, Lauthorpe (*i.e.*: Linthorpe), Lythe, Maltby, Marwood, Middleton, Milburn, Mountain, Newton, Sherwood, Skelton, Slingsby, Stockton, Thornaby, Trenholme, Trousdale, Wellbury, Wilton, Yorke. This list might be considerably extended, and there are few villages in the neighbourhood, the names of which do not recur as surnames in our Parish records.

FROM THE CHOIR TRIP RECORD, OCTOBER, 1890.—"Much of the district through which the route lay (to Rievaulx) was, in the days of its prosperity, in the possession of Rievaulx Abbey. In fact the ancient territory of this great Religious House was entered before the limit of the Parish of Ingleby was reached. We were reminded of this on coming to Hagg Yat, just at the entrance of Bilsdale, for an old document still existing recounts how Stephen de Meinill, Lord of the Manor of Greenhow, granted to the Abbot and Monks certain lands in the neighbourhood of *Haggsgata*. Since those days the word "gate" which then signified a road has changed its meaning, and has come to signify the wooden structure which obstructs the road. We here, therefore, have an interesting survival of an old name, the meaning of the word and its application having in this instance correspondingly changed. In like manner, Chop Yat, which was shortly afterwards reached, was probably originally "Market Road," that is, either the road to the Market, or the road upon which, or near which the actual buying and selling was done.

NOVEMBER, 1890. AN ANCIENT CASTLE.—It has occurred to us that the following note written for another purpose may not be without interest to some of the readers of the *Parish Magazine*. "The term "Castle" is a very grandiloquent one, whereby we describe the subject of this note, but the subject appears to be worth a note. Those who have visited this part of Cleveland will be aware that the south-eastern slopes of the hill upon which Captain Cook's Monument stands, are ornamented at about half their elevation by a belt due to the superior hardness of the *Margaritatus* rocks as compared with those immediately above and below. Below the belt the space is occupied by the picturesque woods of Easby and Kildale. Just



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INGLEBY, WITH VICARAGE.



above the belt the denuding forces have quarried back the shale in such a way as to leave an extensive platform surmounting the steep wooded slopes. Upon this platform stands the farm-house of Burrow Greens, and along the verge of it on the Ordnance Maps, the name "Castle Hills" is written. I have learned that the name "Castle Hills" survives as that of two fields in that position, and it was probably obtained by the officers of the survey from some old field book or farmer's agreement. No historian of Cleveland, so far as I am aware, has made any mention of a Castle, or the indication of the former existence of a castle at that place, and the latest of them—Dr. Atkinson—once mentioned to me that he had never visited it. The Ordnance Survey Maps give no indication of an earth-work, as they usually do where one exists.

Suspecting that something of interest might turn up I recently paid a visit of exploration to the place, and soon discovered that my suspicions had an excellent foundation. At the angle of the platform I found a space railed round and occupied by trees of fairly ancient growth, such as the beech, the oak, and the hawthorn. Here had evidently been the structure responsible for the names of "Castle Hills" and "Burrow Greens." Around three sides of the space indicated there runs a well preserved moat, the fourth side being formed by the almost perpendicularly-falling bank. The enclosure thus formed is approximately square, the corners behind being, however, somewhat rounded. It is about 50 yards in diameter in each direction. Immediately within the moat is an irregular raised ridge, highest about the corners away from the cliff. The centre of the enclosed space is slightly depressed, but the enclosure as a whole is somewhat raised—partly by natural and partly by human agency—above the level of the field behind. No trace of the stonework survives at the surface. The situation is, in some of its features, not altogether unlike that of Knaresborough Castle, but is considerably more elevated above the encircling stream. Anyone visiting the spot must be struck with its commanding position, overlooking as it does, the entrance to the dale which connects Whitby with the Cleveland plain. I must leave it to others to deduce from the name, the appearance, and the position, the probable date of this so-called Castle.

MARCH, 1893. THE GLASS WINDOW.—Mr. William Brown, of Trenholme, sends us the following extract from an old will which he lately met with:—"19th April, 1526. Rob. Ascoo of Grenowe of the par. of Yngleby in Cleveland. My body to be buried in

Yngleby Church, under the glasse wyndoo of the Southside of the Church. To the Church warke and for my beriall vjs viijd. To Yngleby Church ij torches." Mr. Brown points out that this was perhaps the only glass window in the Church at that date. The manufacture of glass has of course long been known. We have in our possession some bottles dating from the period when the Romans were the masters of the country, or what afterwards became such. Its use for Church-windows also was early. About 675 Benedict Biscop, who was at the time erecting a religious house at the mouth of the Wear, sent to Gaul for men to make glass for the windows thereof. The historian tells us that there had been no glass makers in this country previously. Before they returned they taught the English the art of making glass. It did not however become general in the windows of country Churches till long after this:

MAY, 1893. GOD AND THE CHURCH.—On page xii of the Introduction to the Ingleby Parish Register, of which so many of the subscribers to the magazine possess copies, there is printed a Latin document, with the following English translation:—“Let all men know, present and future, that I, Stephen Hay, have given and by this my present charter confirmed to God and the Church of St. Andrew of Ingleby, one half acre of land in Ingleby, namely on the outside at the north of my two oxgangs in Aistangarthes, for the salvation of my soul and the souls of my fathers and mothers and ancestors, for a free and pure and perpetual alms:—To be held of me and my heirs, freely and exempt from every secular service and exaction. And I and my heirs will warrant the aforesaid alms to the aforesaid Church for ever. These being witnesses R. . . Parson of Ingleby, Walter a Chaplain, Henry a Deacon, Arnald a Deacon, William Lane: and others. There we have an illustration of the way in which the property of the Church of England was given to it. Stephen Hay was on his death bed. He was the possessor of a virgate or yardland, the usual size of holding throughout England, consisting of two oxgangs or bovates of land. The size of the oxgang varied much on account of the nature of the land and because the big manorplough with its eight oxen could turn up a great deal more soil in light land than in heavy. So there were bigger oxgangs on light land. In Little Broughton where there must have been some strong clay, there were some oxgangs of only eight acres, and in Great Broughton, where there must have been light land, there were some with as many as eighteen acres. The average size of the oxgang in England was about 15 acres, and it so happens that it was of exactly this size in that part of the parish of Ingleby in which



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Mr. Hay's land lay. Perhaps he had other land, but at any rate he had a normal peasant holding of 30 acres in Aistangarthes, a remarkable district partly in Ingleby and partly in Little Broughton. The name survives in "Hasty Garth," a field name on the farm occupied by Mr. John Seaton, and in some adjoining field-names it has been further corrupted into "Hayle Garths." In memory of his pious ancestors, and in the hope, and with the prayer that the gift may bring a blessing upon himself, he dedicates to "God and the Church of St. Andrew of Ingleby" a portion of his worldly possessions, to be their heritage for ever. Carefully note that he does not leave it to the Church of England as a corporation, for the Church of England is not a corporation for property-holding. Each incumbent is a "Corporation Sole" in whom is vested God's property. So Stephen Hay leaves his land to "God, and the Church of St. Andrew of Ingleby," the very identical Church of St. Andrew in which we worship every Sunday (though some portions of it have been rebuilt since then) which at that date, 740 years ago or a little more, had then been newly built or re-built, for the services of that same identical Church of England to which we ourselves are so truly proud to belong.

RAINFALL IN 1896.—The fall of rain at the Vicarage during 1896, amounted to 32·93 inches. One inch is equal to about 100 tons per acre, so that the entire fall was equal to about 3,293 tons per acre. And as the parish contains 7,002 acres the entire fall upon the parish would be about 23 millions of tons, giving about 46,000 tons, or over 10 millions of gallons to each inhabitant. And yet we are talking about a deficient water supply! In the first six months the fall was exactly eight inches, or less than a quarter of the whole. The average fall at the Vicarage for the last 13 years has been 31·14 inches, so that in spite of the dryness in the early part of the year the fall of 1896 has been more than an inch above the average. In 1895 it was nearly the same, namely 32·64 inches. We had last year 201 wet days, the average number being 193. The monthly falls of rain were as follow:—

January	...	0·89	inches	July	...	2·04	inches
February	...	0·47	"	August	...	3·19	"
March	...	2·46	"	September	...	3·80	"
April	...	0·63	"	October	...	7·86	"
May	...	1·07	"	November	...	2·99	"
June	...	3·48	"	December	...	4·55	"

DECEMBER, 1897. ST. CHAD.—As the parish of Ingleby joined the old parish of Lastingham, which, (if our information be

correct), included the present parish of Bransdale-cum-Farndale, a short account of this great Northumbrian Saint may not be without interest. You will have noticed, no doubt, the name of this Saint opposite the date of March 2nd, the day of his death, in the Calendar in your prayer book or your almanack. Chad lived about the middle of the seventh century, and was one of four brothers, of whom the eldest was probably Cedd, and all of whom became priests. They were no doubt born in the North, but it is not known where. We first hear of Cedd in the year 653, when the son of Penda, King of Mercia, was converted to Christianity, and married a Northumbrian princess. Cedd and three other priests accompanied them into Mercia, which was the Kingdom then including the central portions of England, and up to that time was heathen. Their missionary work was very successful, and large numbers were daily brought into the Church of Christ through the waters of baptism, or as it is expressed "were daily washed in the foundation of faith." After a short period of missionary work in Mercia, Cedd was sent to preach the Word in the kingdom of the East Saxons—the men of Essex—whose King had become a Christian. A little later he was made Bishop of the East Saxons, being consecrated by Finan, Bishop of Lindisfarne, assisted by two other Bishops. On one occasion when Bishop Cedd had come to pay a visit to his brothers in the north, Oswy, King of Northumbria—which included Yorkshire—asked him to build a Monastery in his kingdom "to which the King himself might frequently resort, to offer his prayers to the Lord, and hear the Word, and where he might be buried when he died." He accordingly founded the monastery of Lastingham. Here Cedd died and was buried after he had appointed his brother Chad to succeed him in the Government of the Monastery. Chad did not, however, long remain Abbot of Lastingham, but was appointed Bishop of York. Just at that time there was, as it were, two streams of Christianity mingling in the North of England. There was the older stream from Iona, and the newer one from Rome. Wilfrid had been appointed Bishop of York by the Rome party, and had gone to Rome for consecration. When he returned, Chad who had been appointed by the Iona party, was in possession of the see. Wilfrid, like a good man and true, made no trouble about it, but quietly retired to the monastery at Ripon. A little later that grand man, Theodore of Tarsus, Archbishop of Canterbury, came down and tried to make out that Chad had not been properly consecrated. Chad said, "If you are persuaded that I have not duly received episcopal ordination, I gladly resign the office, for

I never thought myself worthy of it, but, though unworthy in obedience to authority, I yielded so as to undertake it." Theodore was greatly touched by his humility, and exclaimed that he should not resign the bishopric. But Chad insisted on doing so, and retired again to the monastery of Lastingham. There we will leave him for the present.

JANUARY, 1898. St. Chad.—When Chad was recommended for the Bishopric of York he was described as "a holy man, grave in character, well read in the Scriptures, and diligently practising what he learnt therein." For the three years during which he held the Bishopric "he toiled humbly and quietly in true Apostolic fashion, travelling about, generally on foot, and preaching the Gospel in the towns and open country and the villages, wherever an opening was found, whether it was in the peasant's cottage, or the great man's castle." Last month we left Chad in retirement at Lastingham after he had resigned the see of York. But he did not stay there long, for Archbishop Theodore persuaded him to accept the Bishopric of Mercia. Theodore found fault with him for walking so much, and commanded him to ride whenever he had a long journey to make, "and finding him very unwilling to omit, out of love to it, his former pious labour, he himself, with his own hands, lifted him on the horse; for he thought him a holy man, and therefore obliged him to ride wherever he had to go."

And so Chad went into Mercia, and fixed the seat of his rule at Lichfield, where he died and was buried. Bede tells us that for two years and a half he gloriously governed the church there. He often used to retire to a monastery near the Church, where he was wont to pray and read with seven or eight of the brethren, as often as he had any spare time from the labour and ministry of the Word—The legend of his death is very beautiful. One of his pupils, we are told, was at work outside the little Church where Chad was praying, when he suddenly heard the sound of persons singing most sweetly and rejoicing, and appearing to descend from heaven to earth.—The voices gradually drew near to him, till they came to the Church where the bishop was, and entering, filled the same, and all round about it—The good man listened awhile, and after some thirty minutes heard the same song of joy ascending, and returning to heaven by the way it came, with inexpressible sweetness. Suddenly the bishop signed to him, and bade him come with the seven brethren of the house to the Church. "When they were come, he first admonished them to preserve the virtue of love and peace among themselves,

and towards all others; indefatigably to practice the rules of regular discipline, which they had either been taught by him, or seen him observe, or had noticed in the words or actions of former fathers. Then he added, that the day of his death was at hand; for, said he, "that loving guest who was wont to visit our brethren has vouchsafed to come to me also this day, and to call me out of this world—Return, therefore, to the Church, and speak to the brethren, that they in their prayers recommend my departure to our Lord, and, that they be careful to provide beforehand for their own, the hour whereof is uncertain, by watching, prayer, and good works." When he had spoken thus much, and they had gone away in much sorrow, he who had heard the heavenly song returned alone and besought leave to ask a question. "Ask what you will" answered the bishop. Then he said, "I entreat you to tell me what song of joy was that which I heard of beings descending upon this oratory, and some time after returning to heaven." The bishop answered, "if you heard the singing, and knew of the coming of the heavenly company, I command you, in the name of our Lord, that you do not tell the same to anyone before my death. They truly were angelic spirits who came to call me to my heavenly reward, which I have always loved and longed for; and they promised that they would return seven days hence, and take me away with them." And seven days later the soul of the gentle Chad passed away from earth.

MAY, 1896. A Lenten Hymn.—The following simple hymn, written during a walk from Bilsdale to Ingleby, on Sunday, January 30th, was sung in Ingleby Church, on Sunday, March 6th:—

1. I feel that I have erred and stray'd
And that my sins are sore,
And yet I feel that God is good,
And shutteth not the door.
2. I seem to see with eye of faith,
Though dim and distant still,
A place reserved for me on high,
That none but I may fill.
3. Lord Jesu! grant me grace to pray
With earnest loving heart,
That I may gain that Blessed Home,
Thence never to depart;
4. That I may love God's House on earth,
Still more His Home above;
That I may reach His Dwelling-place
And give Him all my love.



J. W. Brutton.

AVENUE ENTRANCE, INGLEBY MANOR.



5. And may these holy days of Lent
Lead me to fix in faith
My thoughts on Him who rules the earth,
And doeth what He saith.

6. So when the World's great Easter comes
And all the dead shall rise,
E'en I—though I have err'd and stray'd—
Shall reign beyond the skies.

[This touching hymn is the only one we have met with as showing
Mr. Hawell as a Hymn writer].

AUGUST, 1898. Rainfall at Ingleby Greenhow.—The fall of
rain as registered at the Vicarage, for the first six months of the
present year has been as follows :

January ...	...	0·65 inches on 10 days
February ...	...	1·90 „ 19 „
March ...	...	2·99 „ 16 „
April ...	...	2·52 „ 15 „
May ...	...	2·38 „ 17 „
June ...	...	1·81 „ 16 „
		—
TOTAL ...	...	12·25 93

MARCH, 1900. Rainfall.—The following is the measurement
of the fall of rain as taken at the Vicarage during 1899 :—

January ...	...	3·38 inches on 20 days
February ..	...	2·17 „ 12 „
March ...	...	2·22 „ 16 „
April ...	...	2·96 „ 22 „
May ...	...	4·27 „ 18 „
June ...	...	1·44 „ 9 „
July ...	...	1·31 „ 7 „
August ...	...	0·96 „ 7 „
September	...	3·40 „ 18 „
October ...	...	3·54 „ 10 „
November...	...	2·20 „ 13 „
December...	...	3·23 „ 17 „
		—
TOTAL ...	...	31·08 inches on 169 days

Since 1884 the number of inches and the number of wet days have been as follow:—

26·95 (?) ;	33·54 (207) ;	39·64 (204) ;	29·74 (185) ;
28·55 (193) ;	30·55 (185) ;	30·61 (194) ;	33·18 (191) ;
30·48 (189) ;	27·38 (165) ;	28·61 (205) ;	32·64 (196) ;
32·93 (201) ;	28·82 (196) ;	27·31 (170) ;	31·08 ((169)).

From the above figures it appears that the average yearly fall is 30·75 inches on 190 days. Last year, therefore, we had practically the average amount of rain, but the wet days were 21 fewer than the average. The present year has been more wet than 1899 so far as it has gone. In January we had 3·56 inches on 23 days. The average rainfall in January for 17 years has been 2·42 inches on 18 days. The fall of rain at Ingleby Manor is usually greater than at the Vicarage, while the fall at Easby is less. In order to elucidate to some extent the law governing the fall of rain in the neighbourhood we are endeavouring to establish a rain-gauge in the vicinity of Botton Head, the highest point of Eastern Yorkshire.

APRIL, 1900. Rainfall.—In February we had a greater rainfall—of course including snow—than we have ever before had in that month since our measurements began. The depth registered at the Vicarage was 5·48 inches, which fell on 23 days. The nearest approach to this was the fall of February 1893, when we had 3·23 inches on 16 days, and only in two other years has it exceeded two inches, namely 2·29 inches on 19 days in 1892, and 2·17 inches on 12 days last year. In February 1891, we had only 0·11 inches of rainfall on 6 days, this being the driest month in 17 years. The average fall in February has been 1·78 inches on 14 days. Until this year the largest number of wet days was 20 in 1889. Up to the end of February this year we have had a fall of 9·04 inches on 46 days the average being 4·20 inches on 32 days. So that the fall of the first two months of 1900 has been more than double the average.

JANUARY, 1901. Water borings at Stokesley.—It has been suggested that the results of certain operations in boring for water should be placed on record in the pages of our magazine, and by the kindness of Messrs Carrick, Wiggins, and Wetherill, who have supplied the following information, we are able to give certain facts which may be of more or less general interest, as showing the results in different parts of the town. Mr. Carrick, whose borings were considerably the deepest has unfortunately met with disappointing results, having left off without finding water.



J. W. Brotton.

BANK FOOT, WITH TURKEY NAB.



T. Wiggins & Son's boring, made in 1887.

2 ft.	...	...	...	...	Soil
1 ft.	...	...	...	...	Yellow clay
Water rises to within 7 ft of the surface in the tube					Sand and gravel, but not so much gravel as at old bore-hole
35 ft.	...	...	...	...	Greatest supply of water here
2 ft.	...	...	...	...	Bookleaf loam
					BORE
					Lower boulder clay, some parts containing more stones than others. All the stones water-worn.
68 ft.	...	...	...	...	Small quantity of water about middle of clay bed
2 ft.	...	...	...	...	Red marl, very dry. No sign of water here
110 ft.	...	...	...	...	Left off boring.

The Auction Mart Co's. boring at the New Inn, made in 1899:—

Light spring at 8 ft. (apparently much contaminated)					Blue sandy loam
31 ft.	...	...	...	...	Blue Clay, mixed with small stones
56 ft.	Light spring 1 ft.				Sandy bed
					Blue clay
					BORE
64 ft.	Light spring				Gravel bed [Analysis]
110 ft.	...	...	...	...	Hard blue clay, mixed with small stones
					Red marl stone, or red shale
A powerful* spring 140 ft.					[Analysis]

*This spring rises in the pipe to 3 ft. above surface level, and has continued running from a tap night and day since November 16, 1899, on which date it was found.

Analyst's Report on Water obtained at a depth of 64 feet:—

BOROUGH HALL, STOCKTON-ON-TEES,
July 31st 1899.

I hereby certify that the following are the results of an analysis of the sample of water received on the 26th instant, from Mr. G. W. Weatherill, High Street, Stokesley:—

Description of sample	...	...	...	Grains per Gallon
from spring (64 ft).	...	...	...
Drawn on the 26th instant	...	...	...
Appearance in 2 ft tube	...	...	...	Pale straw and milky
Smell when heated to 100 degrees F.	...	...	...	Earthy
Chlorine in Chlorides	...	...	...	10.80
Phosphoric acid in phosphates	...	...	...	Trace
Nitrogen in Nitrates and Nitrites...	...	...	...	Slight trace
Ammonia	...	...	...	.04760
Albuminoid Ammonia	...	...	...	.00700
Total solid matter dried at 212 degrees F.	...	...	...	233.24
Microscopical examination of deposit	...	...	...	Mineral matter, etc.

This water is not suitable for drinking purposes or domestic use. It is a very hard water, and is polluted with organic matter.

As witness my hand this 31st day of July, 1899.

(Signed), A. C. WILSON, F.C.S.

Analyst's Report on Water obtained at a depth of 140 ft.—

BOROUGH HALL, STOCKTON-ON-TEES,
February 2nd, 1900.

I hereby certify that the following are the results of an analysis of the sample of water received on the 31st ulto. from Mr. G. W. Weatherill, Stokesley :—

	Grains per Gallon
Description of sample	Spring water
Drawn	from well (140)
Appearance in two-foot tube	Clear, pale straw (almost colourless)
Smell when heated to 100 degrees F. ...	Very slightly earthy
Chlorine in Chlorides ... ..	... .. 10.52
Phosphoric Acid in Phosphates	Very slight trace
Nitrogen in Nitrates and Nitrites	Very slight trace
Ammonia ... ..	... .. .0016
Albuminoid Ammonia ... ..	... .. .0007
Total solid matter dried at 212 degrees F. ... ..	... .. 236.32
Microscopical examination of deposit ...	Satisfactory

This water is remarkably free from organic pollution, but is heavily charged with soluble salts, and will be found extremely hard.

As witness my hand this 2nd day of February, 1900.

(Signed), A. C. WILSON, F.R.S.E.

Mr. Carrick's boring, 1900 :—

63 ft.	BORE	Sand with thin beds of clay
4 ft.		Clay and boulder-stones
124 ft.		Red marl, dry and hard
191 ft.		Left off boring

MARCH, 1901. Rainfall in 1900.—The following is the monthly record of rainfall during 1900, as measured at the Vicarage:—

January	3·56 inches on 23 days
February	5·48 ,, 23 ,,
March	1·93 ,, 19 ,,
April	1·14 ,, 13 ,,
May	1·35 ,, 12 ,,
June	3·22 ,, 20 ,,
July	1·63 ,, 16 ,,
August	7·07 ,, 19 ,,
September	0·82 ,, 9 ,,
October	6·13 ,, 24 ,,
November... ..	3·40 ,, 24 ,,
December... ..	2·28 ,, 18 ,,
	—
TOTAL	38·02 ,, 220
	=

The average rainfall for the 16 previous years has been 30·75 inches. The fall last year was $7\frac{1}{4}$ inches above this and brought up the average for 17 years to 31·18 inches. Only in one year has last year's total been exceeded, namely, in 1886, when the measurement was 39·64 inches on 204 days. In no other year has it exceeded 33·54 inches. The lightest fall recorded was 26·95 inches in 1894. Until last year the number of days on which at least one hundredth of an inch of rain fell had never exceeded 207. The average number of wet days for 16 years has been 192. But though the year was one of excessive wet, it was apparently by no means unhealthy. It seemed to us that there was less sickness than usual prevalent, while the only two persons who died in the parish during the year were each over 80.

FEBRUARY, 1902. Rainfall in 1901.—It was mentioned in the March number of the Magazine for last year that the average annual fall of rain as measured at the Vicarage for 17 years up to and including the year 1900 was 31·18 inches. At the end of October last we had only had 21·45 inches of rain, or about two thirds of the average annual fall. There was 9·73 inches to make up, and only two months to do it in. But in November we had some drenching rains, especially on the 12th when 2·35 inches fell. And the fall in December was greater still, including

1.16 inch on the 12th. So by a remarkable coincidence the year's rainfall was brought exactly up to the average. The average remains, therefore, precisely as before. Appended is the monthly fall during 1901, together with the number of wet days in each month:—

January ...	...	1.78 inches	on 17 days
February ...	..	2.99	„ 24 „
March ...	...	2.72	„ 24 „
April ...	...	1.77	„ 15 „
May ...	...	1.55	„ 10 „
June ...	...	2.06	„ 13 „
July ...	..	4.23	„ 13 „
August ...	...	1.36	„ 13 „
September	...	0.99	„ 18 „
October ...	...	2.00	„ 18 „
November...	...	4.84	„ 17 „
December...	...	4.89	„ 20 „
		—	—
		31.18	202
		==	==

The average number of wet days in the previous 16 years was 192.

APRIL, 1902. An Old Inscription.—On a stone placed over the door of an old building near Battersby Hall is an inscription which is meant to read as follows: “Anno Domini 1670—R.W.—R.H.” We take it that most of our readers are familiar with our Ingleby Register and Parochial Monograph, and are consequently aware that at the close of the 16th and in the early portion of the 17th Century Battersby Hall was occupied by a branch of the Ridley family, connections of Dr. Ridley, burnt at the stake in 1555, and of the present Lord Ridley. A Pedigree of this branch will be found on page XLVIII of the Monograph. This branch apparently became extinct in the male line in 1639. In the above-named inscription the “R.W.” probably represents Robert Ward who married Anne Ridley, May 4th, 1640. This Anne was probably a daughter and not improbably heiress, of Nicholas Ridley of Battersby Hall, who was buried at Ingleby as an “Octogenarius,” June 29th, 1639. The only son of whom we find mention in the Ingleby Register is William, baptised in 1595, and buried June 9th, 1639. A Robert Warde, son of Richard Warde, was baptised in 1595. Anne, wife of Robert Ward

of Battersbie, was buried in 1675. Then in 1677, Robert Ward (not improbably the same) married Mary Marwood. In 1680, Robert Ward de Battersbie, was buried. In 1684, Mary Ward, widow, married Geo. Cooper. In 1699, Mary, wife of Geo. Cooper, died at Battersby.

LECTURE AT EASBY.—On Wednesday evening, March 5th, at the conclusion of the Lenten Service in the Church, the congregation adjourned to the carriage-house of the Hall, where they were joined by several friends, and a lecture illustrated by lime light views was given by the Rev. J. Hawell. Referring to the service they had just left the lecturer said there was no incongruity between the successive addresses. The great green book of Nature was but a companion volume of the old brown Book which they had just closed. The Bible stated that God made the world "in the beginning." It neither told us *when* that beginning was, nor *how* the world was made. These things it remained for the geologist to ascertain by investigation. Glancing at the birth of the moon during the earth's liquid youth, and pointing out the reasons for its airless condition and rugged face, he expressed the opinion that it was probably not very long after the moon's birth that the earth began to get its solid crust, and the hills and valleys, and the solid material out of which *all* hills and valleys should subsequently be formed, began to be. Onwards and downwards from that time—some fifty millions of years ago—he briefly sketched the earth's history, shewing how hypogene forces are ever tending to elevate portions of the earth's surface above ocean level, and how immediately thereupon epigene forces set to work to reduce them to ocean level again. He showed by means of diagrams thrown on the screen how some of the original rivers of the Cleveland area had once flowed, and traced the successive changes up to the time of the great ice age.

The blocks illustrating this paper have been kindly lent by Mr. J. W. Brotton, of Battersby.

THE RIVER TEES: ITS MARSHES AND THEIR FAUNA.*

BY THE LATE R. LOFTHOUSE.

THE River Tees (Teyse, Tesi, Teisa, Tesa, Teise, These, Teysa—of old records) separates the counties of York and Durham. At the mouth of the river there is a vast extent of mud-flats (or, as they are locally called, slems), some thousands of acres in extent. These mud-flats or 'slems' used to be bordered by marshes more or less all the way to Stockton, a distance of about ten or twelve miles, and in former times were resorted to by vast numbers of wild fowl. The marshes on the south side of the river, and a good deal of the fore-shore from Stockton to Eston, have been for the most part re-claimed and filled with slag, and are now occupied by ironworks, wharves, and ship-building yards; and of late years ironworks have been established on the Coatham Marsh opposite to the extreme mouth of the river, on the site of a rabbit warren, and close to a wild duck decoy, which existed there down to the years 1870-2†. On the north side of the river one or two ironworks have been established at Port Clarence, opposite to Middlesbrough, a distance of seven or eight miles from the sea: that of Messrs. Bell Brothers is the principal, and one of the oldest in the district. To the east of Port Clarence, the north side of the river is still open and unoccupied, and the Saltholm Marsh remains in much the same state as in former times, but extensive reclamation works are being carried out on the shore opposite by the Tees Conservancy Commissioners, who have reclaimed or have in course of reclamation over 2,500 acres of land, their operations being confined to the area principally of the foreshore on both sides of the estuary, comprised between high water at spring tides and high water at neaps, and who have constructed over a dozen miles of reclamation-embankments, principally of slag. The mud-flats at the mouth of the river are succeeded by a sandy beach, on the one side reaching from Seaton Snook to Hartlepool, and on the other by perhaps one of the finest stretches of sand in Great Britain, extending from Tod Point to Saltburn, a distance of seven or eight miles, and firm enough for horses and vehicular

*This Paper was contributed to the "Naturalist" in 1887.

The notes referring to Seals on the Tees have been omitted. For paper on Seals in the Tees, see C.N.F. Proc. vol. 1, pp. 87-99.

†See vol. 1, pp. 100-105, for description of this decoy.

traffic. These sands are thus referred to in the Cottonian MS., as quoted in Graves's 'History of Cleveland,' p. 399:—'From the passage of the sands, by Reason of the Fyrmenesse and Smoothnesse frequented by such as delight in Swifte Horses, you next come to Redcarre, a poor fysher Towne.' The Tees Conservancy Commissioners have erected a magnificent breakwater at Tod Point, on the south side of the river, and are now erecting another on the north side. This, when complete, will leave the entrance to the river about 700 yards wide. From this breakwater to Middlesbrough there is an area of between 5,000 and 6,000 acres, between the high-water embankments of the Tees Commissioners, which is covered at high tide only, except the channel; the greatest extent of mud-flat is on the north side, and is called Seal Sand; that on the south side is called Bran Sand. Geologically, the basin of the Tees may be said to consist principally of Boulder Clay, with detached patches of an estuarine deposit of sand and gravel in places—the old part of the town of Middlesbrough being built on one of these. Under the Boulder Clay is found the New Red Sandstone; and below this again, at depths varying from 1,000 feet to 1,500 feet, has been found a bed of rock salt, about 100 feet in thickness, and underlying the town of Middlesbrough and adjacent district. It will probably be found to form a kind of basin, and to cover no very extensive area; yet, taking into consideration its great thickness and its quality, it may reasonably be expected to give a great impetus to the town and trade of Middlesbrough and district, with the development of the chemical trades connected with it. It is now being pumped up in the form of soluble brine in one or two places on the north side of the river, and has been reached at boreholes on the south side of the river at Middlesbrough and Eston. The method of raising the salt is thus described in a paper on 'The Iron Trade of Cleveland and the Industries of Middlesbrough,' by Sir Isaac Lowthian Bell, Bart., published in a handbook of Middlesbrough and district:—'A tube, 16 inches diameter, is carried from the surface to the bottom of the bed of salt—the portion which traverses the salt being pierced with holes. Inside this a second tube is placed, open at the lower end. Water is run down the annulus formed by these two tubes, and, becoming saturated with salt, rises in the internal tube until it is balanced by the outer column of fresh water. The proportional weight of fresh water and brine is as 1,000 is to 1,200, so that the inner column stands considerably below the outer. A pump is placed at the top of the inner column, and by this means the brine is raised to the surface.'

It would appear that the manufacture of salt is an old industry on the Tees, though operations appear to have been confined to the surface in former times. Brewster thus refers to it in his 'History of Stockton':—'Near the mouth of the Tees, on Seaton and Greatham Marshes, anciently were very considerable salt works. Traces of these works are still to be seen, and have the appearance of breastworks and fortifications. By an inquisition post mortem (an^o 36, Hatfield, 1380), it appears that Robert, son of Marm. de Lumley, Knight, died seized of 25s. rent and one quart of salt issuing out of three messuages and one saltwork in the tenure of John de Carrowe in Seaton. And by another inquisition of the same kind (an^o 15, Langley, 1421), that Arnisia, the widow of Thomas de Elmedon, died seized of a quarter part of the manor of Seaton, consisting, among other things of a saltwork value 2s., another saltwork, and a fourth part of a saltwork, and the passage of the river Teese. The farms in the parish of Greatham, bordering upon the marshes, holden by leases under the Master and Brethren of the Hospital of God in Greatham, are covenanted to pay a stipulated number of bushels of salt as an acknowledgement to the hospital, which, of course, are now commuted for a money payment.' In Burton's Mon. Ebor. it is stated that the canons of Guisborough possessed considerable saltworks here: and in the Cott. MS. before quoted, is the following reference to salt and other minerals:—'As the Tyde comes in, yt bringethe a small wash Sea-cole, which is employed to the makinge of Salte, and the fuell of the poore fisher Townes adjoininge: the oylie sulphurousness beinge mixed with the salte of the sea as yt floweth, and consequently hard to take fyre, or to keep in long without quenching, they have a meanes, by making small vaults to passe under the hearthes, into which, by fore-setting the wynde with a board they force yt to enter, and so to serve instede of a pair of bellows, which they call in a proper word of art, a blowcole. The shells, sand, and sea-rock serve instead of marle to enrich the land, which is fruitfull of itself, but much bettered by the neighbourhood of the Sea, making the good husbands of the lowe towns fatt in purse and merry in the hearte. Within the sea-marke on oone syde lyeth a rock of excellent plaister, cankered by the salte water; but if it werr searched from sande, yt is probably that it would prove pure alabaster.'

On the north side of the river at Canoe Point, near to Greatham Fleet, are a series of low shelving banks or cliffs of sand and gravel, four or five feet high, grassed over on the top; the face

of these reveal a large mixture of shells, chiefly cockles, mussels, and whelks, at a depth of about 18 inches from the the surface, which would almost suggest that the river had at some remote time emptied at a higher level, and covered much of the adjoining marshes and land which is now under cultivation; or perhaps, more properly speaking, that the beach had been raised. In the vicinity of the river, near Middlesbrough, are found patches of peat, in which occur large quantities of timber, in most cases hard and sound, and with the bark still on. In digging for drainage and foundation works, the stems of trees have frequently to be sawn through at each side of the cutting; in this peat have also been found deer's horns in perfect condition. The dredges of the Tees Conservancy Commissioners have at various times brought to the surface semi-fossil remains. In the Albert Park at Middlesbrough is a gigantic tree, dredged from the bed of the river some years ago, and said to be oak; it is perfectly sound and hard—indeed, sound enough to be made into furniture. I have also seen a fairly perfect skull of an animal of the genus *Bos* (probably *Bos primigenius*), which measured 2 ft. 4 in. across the horns—which were, however, imperfect—8 in. across the skull just below the horns, 10½ in. at the eyes, and 1 ft. 9 in. in height, though imperfect. I have also seen part of a very large skull, probably a Mastodon, and a single vertebra (of some animal) fully a foot in diameter, and two very large and perfect deer's horns, besides many other bones; these are all in private hands, and have not been examined by any expert, so far as I am aware.

Turning to the fauna of the Tees, if we look over the Ordnance and other maps, we find many names suggestive of the same, some of animals long since extinct. We have Seal Sand in the river estuary, and Seal Goit on the coast beyond Saltburn, Wolviston and Wolviston Grange on the north side of the river, and, as might be expected, Cowpen in the same neighbourhood; then we have Hartburn, near Stockton, and Hart and Hartlepool on the adjoining coast, and, of less significance, Hunter Hall and Cat Coat; and on the south side, Warrenby at the mouth of the river, Eaglescliffe near Yarm, and probably Ayresome near Newport, North Hern near Hartlepool, and Dabholm Beck adjoining Coatham Marshes.

Porpoises (*Phocoena communis*) are abundant in the sea at the mouth of the river, and frequently enter and are sometimes captured in the river. One was seen in the river at Newport,

near Stockton, quite recently; efforts were made to capture it, but without success. They are generally mentioned together with Seals in old records; and *Porcus Marinus* appears to have been a favourite dish with the old monks and the aristocracy, as appears from numerous entries in the 'Durham Household Book' before mentioned, and from their frequent mention in bills of fare of famous feasts. Otters (*Lutra vulgaris*) are found in the higher reaches of the Tees, but not often at the estuary. Some years ago one was caught at the Middlesbrough Docks, and I have heard of another caught near Stockton Racecourse. Brewster, in his 'History of Stockton' before referred to, states that the Otter is rare, but occasionally caught in the Tees. Two were seen on the rocks at Winston Bridge, about the end of April, 1883. The Water Rat (*Arvicola amphibia*) is common in all the tidal 'stells' which run into the Tees. The common or Norway Rat (*Mus decumanus*) swarms in all the reclamation embankments constructed by the Tees Commissioners, particularly those constructed of slag, and make short work of any wounded birds taking refuge there. The old English or Black Rat (*Mus rattus*) still lingers in some old warehouses at Stockton, and, I believe, in an old building at Middlesbrough,* and probably at Yarm also. Three fine specimens in Newcastle Museum were procured at Stockton, in 1868; they are jet black, and finer and larger than other specimens in the same museum from the south of England. Hares (*Lepus timidus*) have a peculiar partiality for the reclaimed land on the Tees' banks; at one place where the game is preserved they are very numerous. In the Saltholm and adjoining marshes several Kestrels (*Falco tinnunculus*) may often be noticed at the same time, hovering over the rough grass, on the look-out for Mice and Shrews, which there abound, particularly the Long-tailed Field Mouse (*Mus Sylvaticus*), the Field Vole (*Arvicola agrestis*), and the Common Shrew (*Sorex tetragonurus*). Notwithstanding the aversion which the carnivora are supposed to have for the last, I once shot a Weasel (*Mustela vulgaris*) which was carrying one in its mouth, but on picking the Shrew up I found it impossible to discern any wound on it whatever. We have also in the neighbourhood, I believe, two Water Shrews, *S. fodiens* and *S. remifer* Macg. I have myself caught the latter with eight young. In the drier part of the marshes and the adjoining land, Moles (*Talpa europaea*) are common, cream-coloured individuals being occasionally met with.

*See C.N.F. Club Proceedings, Vol. II., p. 42.

The sands and mud-flats of the Tees estuary and the adjoining marshes have always been the resort of vast numbers of wild fowl, and many very rare birds have at various times been procured here; their numbers have, however, greatly decreased of late years, owing to the increase of shipping and boating on the river, the reclamation works, and the yearly increasing number of shooters, who take advantage of the reclamation embankments which have been made to intersect the mud-flats, or, as they are locally called, 'slems.' As these banks are formed of slag from the ironworks, small huts are easily formed in them, where a shooter can sit completely concealed, and wait the rising of the tide, when the Waders are compelled to leave and seek refuge in the adjoining marshes, and, of course, have to cross the banks; at times great numbers are thus shot, both of Waders and Ducks. At various places on the mud-flats may be observed the tops of casks, protruding out of the mud eight or nine inches. These have been put down by wild-fowlers to conceal themselves in (before the slag banks were built). They had to be approached on mud-pattens, or flat pieces of wood fixed to the boots, to prevent sinking into the mud. The casks had to be baled out every time they were used, not a very pleasant proceeding on a frosty day in winter; nor would they form a very comfortable waiting place when they were baled out. Curious experiences are related by some old wild-fowlers, who in former years were in the habit of using these casks. I have heard of one man who, after baling out his cask, was in the act of lowering himself into it when he accidentally caught the trigger of his gun with his foot, and had his hand shattered. The wild-fowlers frequenting the Tees at the present time are chiefly working men from Middlesbrough, and the guns they carry are a study in themselves, every conceivable kind of weapon being brought into requisition, from the modern breech-loader to adaptations of the flint and steel guns of our forefathers; the greater number are single muzzle-loaders. Some have old duck guns, such as were formerly used in the fen districts, fully six feet long over the stock, and almost as heavy as a punt gun. Some of these guns will kill at very long distances. One man I have met carries a double-barrelled 'Joe Manton,' which has been a very expensive gun in its day, and formerly belonged to Wynyard. Punt guns are also still used on the river, and, I understand, were much more frequently so formerly, when the river was periodically visited by wild-fowlers from Lincolnshire and other places, who usually took up their quarters on the river for some time.

In the Coatham marshes, on the south side of the river, there existed down to the years 1870-72 a Wild Duck decoy, in which used to be taken the Mallard (*Anas boschas*), Sheldrake (*Tadorna vulpanser*), Widgeon (*Mareca penelope*), Pintail (*Dafila acuta*), Shoveller (*Spatula clypeata*), and Pochard (*Fuligula ferina*), and occasionally the Scaup Duck (*Fuligula marila*). On the 17th of March, 1850, a Ferruginous Duck (*Nyroca ferruginea*), was taken. Very little indication of this decoy now remains, the establishment of the ironworks in the neighbourhood would soon scare the birds away. That most beautiful of our native ducks, the Sheldrake (*Tadorna vulpanser*), used to breed in some numbers on the sandhills at both sides of the estuary, and does yet in limited numbers. I have frequently seen old birds in the breeding season; and the birds shot early in the autumn are chiefly young. In 1880 a pair nested in a metal pipe that goes under a slag-bank at Tod Point. In 1883 a pair nested in a slag-bank at the north side of the river. The young birds were caught by some navvies who were working there, and, I am afraid, destroyed. I have heard of several other nests being found within these last few years, but I am afraid in most cases the eggs have been taken. There is an accession of numbers in winter, when flocks of from three or four to a dozen or more are not unfrequently met with. The Mallard (*Anas boschas*) is sometimes met with in large numbers in the autumn and winter months, flocks of one hundred or more being not unfrequently seen. A few years ago a number were washed ashore dead at Tod Point after a severe gale. The other ducks most commonly met with are the Widgeon (*Mareca penelope*) and Teal (*Querquedula crecca*). The Mallard and Teal breed here in the marshes, and it is possible that the Garganey Teal (*Querquedula circia*) may occasionally. I have known an old and a young bird to be shot together in August. Others of the duck tribe frequently met with are the Goldeneye (*Clangula glaucion*), Shoveller (*Spatula clypeata*), Pintail (*Dafila acuta*), Pochard (*Fuligula ferina*), Scaup Duck (*F. marila*), Tufted Duck (*F. cristata*), and occasionally the Long-tailed Duck (*Harelda glacialis*) and the Common Scoter (*Ædemia nigra*), in considerable numbers at times in the autumn and winter months. The Eider Duck (*Somateria mollissima*) has been met with a few times in the Tees. The Goosander (*Mergus merganser*) has frequently been met with; one was shot in the winter of 1883. The Dabchick or Little Grebe (*Tuchybaptus fluviatilis*) is a winter resident. The Slavonian or Dusky Grebe (*Podiceps auritus*) and the Eared Grebe (*P. nigricollis*) have also been met with.

It appears that two centuries ago the sands and marshes by the Tees estuary were remarkable for the number of birds which nested there, as the following quotation from the Cott. MS., copied from Graves's 'History of Cleveland' will show:—'Neere unto Dobham, The Porte of the mouth of the Teese [now called Cargo-fleet, or, more properly, the Cleveland Port] the shore lyes flatt, where a shelf of sand raised above the highe water marke, entertaines an infynite number of sea-fowle*, which lay theyr Egges heere and there scatteringlie in such sorte, that in Tyme of Breedinge one can hardly sett his Foote so warylie, that he spoyle not many of theyr Nests. These curious Buylders may furnish themselves with choice of shells and particoloured stones fytt for the makinge of artifyciall works.' In the memory of man large numbers of birds, I have been informed by a friend who was born there. still frequented the shore opposite Cargo-fleet, and nested on the shingle there and in the adjoining ditches and marshes. Wild Ducks, Wild Geese, Snipe, and Water-hens were some of the birds mentioned as breeding here. Snipe may be taken as including the Redshank and others, as I find birds of that kind are called Snipes indifferently by many people in the district. The fore shore at Cargo-fleet is now covered with ironworks and a graving dock. The Ring Dotterel (*Ægialitis hiaticula*) no doubt nested on the shingle, as it does still at a particular place, in some numbers, every season. I have before me, while writing, two eggs of this bird, taken from a nest containing four, found in a slag-bank last year (1885). They are spotted with dark brown, on a drab ground, and also with less distinct greyish-purple spots. Dunlins remain all the spring and summer. The Redshank (*Totanus calidris*) used to nest in Coatham Marshes, and may do still occasionally; a pair nested, to my knowledge, on the north side of the river in the summer of 1884. Two or three Spotted Redshanks (*Totanus fuscus*) were shot at the estuary last autumn.

It is not improbable that the Ruff† (*Machetus pugnax*) bred here formerly. I have seen a very fine pair of male birds that were shot in the month of March, in the act of fighting, twenty-five years ago. Cormorants (*Phalacrocorax carbo*), still nest in the cliffs beyond Saltburn, and during the breeding season they are observed to make daily visits to the Tees mouth.

*Probably Terns, with a few Oyster Catchers and Ringed Plovers.

†See note on Ruff in present Proceedings.

Numbers of non-resident birds sojourn for longer and shorter periods on the sands and mud-flats in the spring and autumn—or, perhaps, more properly speaking, there is a succession of the same species. Autumn birds begin to arrive at the beginning of August, and continue passing southwards until late in October; these are the Whimbrel (*Numenius phaeopus*), Dotterel (*Eudromias morinellus*), Pygmy Curlew (*Tringa subarquata*), Little Stint (*Tringa minuta*), in limited numbers, and others of the Sandpipers. The Dotterels pass here, going north, early in May, and return early in September. The numbers are said to be on the increase; a few years ago, before there was a close time for birds, a local sportsman, who is an expert at tying trout-flies, shot seven in one day; he uses the feathers for many flies. They are stupid birds, and easily shot, allowing themselves to be walked up to and shot in succession. Unlike many of the other migrants, they appear to be oftener met with in the spring than in the autumn migration. In 1883 one killed itself against the telegraph wires, and in the same year over a dozen were observed flying over Cowpen Marshes. The Little Stint (*Tringa minuta*) is occasionally met with; I came across four on the 22nd September last year, and shot one, Their note is a feeble plaintive whistle; nothing like that of the Dunlin.

The Common, Sandwich, and Arctic Terns (*Sterna fluviatilis*, *cantiaca*, and *macrura*) also appear at this time, the first sometimes in great numbers. If one of these birds be shot, the others will hover round it, regardless of their own danger, even after several shots have been fired. The Roseate and Black Terns (*Sterna dougalli* and *Hydrochelidon nigra*) are also occasionally met with; one of the latter was observed among others of the common species this last autumn. The Little Tern (*Sterna minuta*) and the White-winged Black Tern (*Hydrochelidon leucoptera*) have also been met with. All the commoner Gulls are abundant during the winter and autumn months, and in less numbers the whole year. The Iceland, Glaucous, and Little Gulls (*Larus leucopterus*, *L. glaucus*, and *L. minutus*) have been met with occasionally; one of the latter in November of last year (1885); and an Ivory Gull (*Pagophila eburnea*) on the 14th February, 1880.

Hérons (*Ardea cinerea*) are also very common in the autumn, chiefly, if not entirely, young birds; at least, all those I have known to be shot were birds of the year. I remember seeing ten or eleven on the wing together on the 2nd of September, 1884, skimming along lazily just over the surface of the ground. They

leave before the winter sets in. They must come from a considerable distance, as there is no heronry in the neighbourhood; there used to be one at Kildale, another at Sedgefield, and I have been informed there was one at Greatham, but none of them exist at present that I am aware of. Other birds, such as the Grey Plover (*Squatarola helvetica*), are resident, but in diminished numbers, most of the winter; as is also the Turnstone (*Streptilas interpres*), Oystercatcher (*Haematopus ostralegus*), Purple Sandpiper (*Tringa striata*), Knot (*Tringa canutus*), and Bar-tailed Godwit (*Limosa lapponica*). The Common Curlew (*Numenius arquata*), Golden Plover (*Charadrius pluvialis*), and Redshank (*Totanus calidris*) are resident all the year, but in greatly increased numbers in autumn and winter. The Dunlin (*Tringa alpina*) and Ring Dotterel (*Ægialitis hiaticula*) are also resident all the year, and congregate in immense flocks in the autumn and winter, occasionally associated with Knots (*Tringa canutus*), Turnstones (*Streptilas interpres*), Greenshanks (*Totanus canescens*), and Redshanks (*Totanus calidris*). Dunlins (*Tringa alpina*) shot on August 7th still retained the black pectoral patch, but it had entirely disappeared in birds shot on September 22nd. These birds vary greatly, not only in plumage, but in the length of the bill and other members, so much so, that a taxidermist of my acquaintance maintains there are two distinct species, one having a bill much longer and more bent, and more slender legs, than the other.

Of the winter migrants, the average date of the arrival of the Woodcock (*Scolopax rusticola*) at the Tees mouth is about the 5th of October, generally with north-east or easterly winds. They begin to arrive early in September, and continue until late in December, but the greatest number usually arrive about the date named, and, curiously enough, often accompanied by Goldcrested Wrens (*Regulus cristatus*). The breakwater, which is built of slag, at times swarms with these pretty diminutive birds, which arrive in an exhausted condition. In Sharpe's List, published in 1816, it is recorded that many Woodcocks were found drowned on the north sands about twelve years previously, 'in the spring, supposed to have met with a contrary wind,' Redwings (*Turdus iliacus*), and Fieldfares (*T. pilaris*) begin to arrive about the end of September, but the second week in October for the Redwings and the third for the Fieldfares is about the average time of arrival. There is generally, too, a very large immigration of other Thrushes about the same time, or a little earlier, chiefly the Missel Thrush (*Turdus viscivorus*), with a sprinkling of the

Common Thrush (*T. musicus*) and the Blackbird (*T. merula*) amongst them. I have several times noticed the fields suddenly literally to swarm with these birds: they, however, soon disperse, or probably pass on in a body further south. Short-eared Owls (*Asio brachyotus*) arrive chiefly in September and October; Hooded Crows (*Corvus cornix*) about the middle of October; and Snipes (*Gallinago caelestis*) from October, probably on to December. Large numbers of Wild Geese pass over in September and October in flocks of from a dozen to one hundred, and occasionally stay a short time on the mud-flats; they do not, however, frequent the mud-flats much until later on, when cold and frosty weather sets in and they are driven down from the moors. Wild Swans [? *Cygnus musicus* and *bewicki*] frequent the estuary in severe winter weather, and are seen passing over in the autumn months. Individual birds are shot almost every winter, both mature and young birds in grey and white plumage. Sometimes they are observed singly or in pairs, at other times in flocks of from five to upwards of one hundred. I have examined many birds in private collections that were procured on this river. In Brewster's List it is described as follows:—'The Wild Swan visits the marshes near the Tees in large flocks in severe winters. In the beginning of the year 1823, several were killed at Cowpen, and also in January, 1827.' The following actual records of the occurrence of Swans in the Tees are copied chiefly from the last six years' Reports of the Committee appointed by the British Association to collect statistics from the lighthouse-keepers on the migration of birds:—

1879.	December 4th.	—Six at Teesmouth, flying N. to S.
"	" 8th.	—Five at Teesmouth.
"	" 14th.	—Nine "
"	" 15th.	—Forty-three "
"	" 16th.	—Three "
"	" 18th.	—Two "
"	" 20th.	—Ten " 10 a m.
"	" 20th.	—Ninety-five " 11 "
1879-1880.	} Winter,	{ One shot in Billingham Bottoms: a young bird in grey plumage.
1881-1882.	} Winter,	—Two noticed at Durham side of estuary.
1882.	August 5th.	—Six at Teesmouth.
"	October 24th.	—Six "
1883.	March 25th.	—One, Tees Light-vessel.
1884.	October 5th.	—Nine at Redcar, flying N

Semi-wild birds of the tame species or Mute Swan (*Cygnus olor*), that have escaped from confinement on ornamental waters, are frequently met with in the estuary. Last winter one was shot; and on August 1st this year (1886) eighteen put in an appearance, and on the following day eight or ten were shot for wild birds; a few of the remainder were observed about for several days; three were seen by a friend (some distance inland), who supposed them to be wild birds from their strong, steady flight. Bewick's Swan (*Cygnus bewicki*) has been shot in the estuary on two or three occasions. Snow Buntings (*Plectrophanes nivalis*) frequent the margin of the river in winter, arriving about the beginning of November, and departing again early in the spring. They may be seen in vast flocks or clouds, sometimes associated with Larks and other small birds; in severe weather feeding on the stubbles—they eat grain and other seeds, and always appear to be in good condition. I have examined them at all times during their stay here, and never saw one in bad condition; they are exceedingly fat when they arrive in November. I witnessed their arrival on a cold and stormy day the 3rd of November at Tod Point, last year. They appeared to be somewhat exhausted, but heading inland in great numbers; they apparently did not wait long to rest. Larks (*Alauda arvensis*) swarm at times in the winter months by the margin of the river; and vast numbers of Brown Linnets (*Linota cannabina*) and Redpoles (*Linota rufescens*) frequent some patches of Sea Lavender (*Statice limonium*) on the north side of the river, feeding on the seeds. Starlings (*Sturnus vulgaris*) and Lapwings (*Vanellus vulgaris*), associated with Golden Plovers (*Charadrius pluvialis*), congregate in immense flocks on the marshes; and in very severe winter weather Wood Pigeons (*Columba palumbus*) come down to feed after the receding tide. Reed Buntings (*Emberiza scheniclus*) frequent the reeds and long grass by the sides of the saltwater ditches, and breed there; and Meadow Pipits (*Anthus pratensis*) are abundant all the year. Kingfishers (*Alcedo ispida*) are frequently met with by the river-side, and in the small tributaries, but are sadly persecuted by gunners, their skins being readily purchased by the dealers for half-a-crown each. Wheatears (*Saxicola ananthe*) are common on the river-banks during the summer months, and nest there; their numbers are greatly increased during the autumn months when migrating—on August 22nd last year the banks literally swarmed with them. This is one of the earliest of the migrants to arrive with us, generally appearing about March 29th or 30th, and I have seen it so late as October 9th.

The Spotted Crake (*Porzana maruetta*) breeds in the marshes on the north side of the estuary, and is frequently shot in the autumn. Baillon's Crake (*Porzana bailloni*) and the Little Crake (*Porzana parva*) have been met with in the same place.

In stormy weather the Storm Petrel (*Procellaria pelagica*) and the Little Auk (*Mergulus alle*) are often driven into the estuary. On the 22nd November, 1884, I got a fine specimen of the latter, and others were seen.

The Great Snipe (*Gallinago major*) is occasionally shot in the marshes. The Jack Snipe (*Limnocyptes gallinula*) and the Common Snipe (*Gallinago calestis*) were, until late years, abundant, the latter breeding there. In speaking of the Common Snipe, Brewster, in his List, says:—"I am informed that there is a Snipe sometimes shot in the marshes, which is commonly called the Russian Snipe; it is larger than the Common Snipe, and differs from it in the white lines on the back, and some other marks of the plumage. As I have not yet seen a specimen, I know not whether it be a distinct species or only a variety of the Common Snipe."

Of rare birds that have been procured here, I may mention the Avocet (*Recurvirostra avocetta*), the Spoonbill (*Platalea leucorodia*), and some Pallas' Sand Grouse (*Syrhaptes paradoxus*), shot at Port Clarence in 1863, which went to Mr. Oxley's collection at Redcar; two bought at his sale are now in the Newcastle Museum.

A Bee-Eater (*Merops apiaster*) was shot some years ago under peculiar circumstances. A wild-fowler had seated himself in a slag-bank to wait for birds, when suddenly a bird alighted on the barrel of his gun. He shot it, and it turned out to be a specimen of this rare bird.* The commonest of the Falconidæ are the Kestrel (*Tinnunculus alaudarius*) and the Sparrow Hawk (*Accipiter nisus*); and the Merlin (*Falco æsalon*) is by no means uncommon in the autumn and winter months; while the Iceland Falcon (*Falco islandus*), the Hobby (*Falco subbuteo*), and the Rough-legged Buzzard (*Archibuteo lagopus*) have been shot here, and I have heard of one of the latter being noticed inland this autumn (1886).

* Mr. Hancock ('Birds of Northumberland,' &c., p. 28) says an example of the Blue-tailed Bee-eater (*Merops philippinus*) 'was shot near the Snook, Seaton Carew, in August 1862.' I have not been able to ascertain whether the above refers to the same bird as my own note, made several years ago from information communicated by a friend, who saw the bird.

In the autumn of 1883 a Kite (*Milvus iclinus*) was shot near Warrenby, and has been purchased for the Middlesbrough Museum; it was a female bird, and in good condition. A Golden Eagle (*Aquila chrysaetus*) is reported in Brewster's List as having been shot near the Tees on the 5th November, 1823, by Mr. L. Rudd, of Marton, Cleveland. It weighed 12 lbs.; its length was 3 ft. 4 in.; the extent of its wings 7 ft. 5 in.; bill, 3 in. long.

BIRD-NOTES FROM THE TEES DISTRICT DURING THE LATE AUTUMN AND WINTER MONTHS, 1889-90.

SMALL flocks of Dunlins (*Tringa alpina*) and Ringed Plovers (*Aegialitis hiaticula*) frequented the mud-flats and sands at the Tees estuary all the summer as usual.

The autumn migration set in about the end of July. On the 31st, Terns were noticed, probably the Common or Arctic species (*Sterna fluviatilis* or *S. macrura*).

On the 5th of August the flocks of Dunlins and Ring Dotterels had increased in size, and a few Knots (*Tringa canutus*) were seen, also two or three Sheldrakes (*Tadorna cornuta*). On the 17th, Sanderlings (*Calidris arenaria*) were first observed, and a mature bird was shot; Knots were also observed. On the 21st Sanderlings were more common. On the 22nd an extremely large flock of Arctic Terns was noticed in the early morning resting on the sands (they were associated with Gulls of various kinds); one or two were shot for identification. These Terns were noticed in the same place on several successive mornings. On the same date a Curlew Sandpiper (*Tringa subarquata*) was shot—a good specimen, and I heard of another being shot about the same date. On the 23rd, early in the morning, I fell in with a flock of about fifty Little Stints (*Tringa minuta*), and shot one or two for identification; they settled by the margin of a small pool close to where I happened to be concealed, and I had a good chance of observing their quick and lively movements in the shallow water as they probed their bills into the mud. Knots and Sanderlings were more common

at this date, and there were immense flocks of Dunlins and Ring Dotterels while a good many Curlews (*Numenius arquata*) were about. I also noticed about half a dozen Duck, which I think were Teal, but the light at the time was not very good. On the 24th several Bar-tail Godwits (*Limosa lapponica*) and Turnstones (*Streptopelia interpres*) were noticed, and two of the former shot, and one or two Common Terns (*Sterna fluviatilis*) were shot for identification in the place frequented by the Terns before mentioned. A small flock of Little Stints were also noticed, and Sanderlings were frequently seen; this is one of the most restless of shore birds, being always in motion, and running at a very rapid pace for so small a bird. On the 25th I noticed three or four darker birds in the flock of Terns; these were probably Black Terns (*Hydrochelidon nigra*). On this date I picked up a fine Turnstone in winter plumage. About the end of August I heard of two Little Stints being shot at the Durham side of the Tees estuary, and one at Redcar. Some Sandwich Terns (*Sterna cantiaca*) were also shot at Redcar.

About the second week in September I noticed a flock of Terns about ten miles up the river, apparently Arctic or Common Terns, or probably both. About the 17th September an immature Ruff (*Machetes pugnax*) was shot in Cowpen Marshes, and on the 18th two Spotted Crakes (*Porzana maruetta*). On a visit to the Tees Breakwater in the early morning of the 18th September, I noticed four or five Cormorants (*Phalacrocorax carbo*) fishing on the sea side of the breakwater close into the shore; this is a favourite fishing-ground for Cormorants. The morning was bright and the birds seemed singularly large as they circled round and round, every now and again dashing with lightning rapidity into the seething water, sending the spray several feet high, and emerging again in a few moments. A few hours later these same birds may be seen sitting on the rocks opposite Huntcliffe, with their wings spread out to the sun to dry, and presenting a very odd and curious spectacle. Numbers of Gulls and a few Skuas were about, and we witnessed some very pretty chases, the latter invariably seeming to effect his purpose, as evidenced by his sudden drop after a severe chase, to intercept the fish given up by the Gull. On this same morning the sands between the breakwater and Redcar were alive with Wheatears (*Saxicola cyanthe*) and Pied Wagtails (*Motacilla lugubris*), particularly the former, and there was evidently a migration taking place overhead as well; numbers of Larks seemed to be coming in from the north or north-west, and passing on inland.

Great flocks of Lapwings (*Vanellus vulgaris*) and Starlings (*Sturnus vulgaris*) have been about this district all the winter, owing, I suppose, to the very open weather we have had. A Wryneck was shot in the district in the late summer, and a Rose-coloured Pastor (*Pastor roseus*) was shot out of a flock of Starlings at Redcar, and came into the hands of Mr. T. H. Nelson. Fieldfares (*Turdus pilaris*), Redwings (*T. iliacus*), and Hooded Crows (*Corvus cornix*) have been here in their usual numbers.

Of the Sand-Grouse (*Syrhaptes paradoxus*) which favoured this district with their presence in some numbers during the late invasion, I have heard nothing lately, and I question very much whether there is one alive in the district.

THE RUFF IN THE NORTH OF ENGLAND.*

The account of the breeding of the ruff in England, as described by Montagu, has been so frequently quoted as to have become familiar to the majority of ornithologists, though at the present day the bird is not included among the nesting species of this country. It is, therefore, with feelings of great satisfaction I am enabled to announce the fact that, for three successive seasons, a pair, at least, of these interesting and peculiar birds have successfully nested and brought off young within a very short distance of this corner of Cleveland. The first intimation I received of their presence in the neighbourhood was late in June, 1901, when my friend Mr. C. Milburn informed me that a ruff had been seen several times by his friend C. and himself on the edge of the marshes. A diligent search for the nest was, unfortunately, not attended with success, and, in the light of subsequent experience, it appears to be probable that the reeve would by that time have hatched off her eggs and taken her brood away. The ruff disappeared about the end of July.

In the following season an anxious watch was kept for the appearance of the visitors, and on May 10th notice was forwarded to me that the ruff and two reeves had arrived on the scene. The following observations, as noted in my journal, while the

events were fresh in my memory, are given in diary form, and may prove interesting being the impressions of what occurred as recorded on the spot:

May 15th.—Went with M. to the marshes, where we met C. The ruff had been observed “courting.” C. had found the nest of No. 1 reeve (as we termed it), about the centre of the marsh, containing four eggs of a dark green ground colour, blotched and streaked with black; a lovely clutch. On our proceeding to the place the reeve ran off the eggs, which were quite warm. The nest was situated in a tussock of grass, not unlike the position chosen by a redshank, but the cup-shaped depression was deeper and rather greater in diameter than that usually made by the latter species.

May 17th.—Visited the marsh again, and, on my approaching the nest, the ruff appeared on a little hillock, where I watched him through a pair of binoculars for some minutes. He had a yellowish frill with dark edges, and black or purplish ear-tufts; he ran away for a few yards, then hid in the grass, and after a short interval, reappeared in another place, repeating this performance several times. I walked to the nest and flushed the female at about 6ft. distance; she tumbled headlong on the ground, and shuffled along on her breast as though severely wounded and in great distress, her feathers all dishevelled and wings drooping, a truly pitiable object; after dragging herself in this fashion for a few yards, she lay perfectly still, apparently simulating death; next she quietly crept away round a tuft of grass, and slyly peeped back to see what had become of the intruder on her peace (I was prone on the ground, watching her through the glasses); she then lay still again for a little time, and finally, no doubt thinking all was right, stole off among some long grass and tussocks, where she disappeared. The ruff now made his appearance on a slight elevation, whence he flew up and around where I was concealed, as though he wanted to assure himself that no harm was being done to the treasures hidden near. He came directly towards the nest, and alighted close by, put back his ruff, and, after looking round for a few moments, rose and flew off again. I then, after examining the eggs, that were hot and near hatching, walked away out of sight of the nest and awaited developments. Once or twice I saw the ruff’s head pop up among the grass, then disappear, and shortly afterwards reappear at another spot. After waiting half an hour I flushed the reeve again (the ruff was still hovering about). She repeated



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REEVE'S NEST.



her former tactics, crept off crouching close to the ground till she was some 20yds. distant, and then walked away, seemingly unconcerned, in the bunches of long, coarse herbage. I watched her dodging in and out among this for a little while, till she finally disappeared. The ruff, when courting, lowered his wings like a blackcock, and strutted round the females, now and then rising and flying in a circle. He spread his ruff, and repeated these antics for fully twenty minutes. No. 2 reeve's nest is as yet undiscovered.

May 20th.—Went to the marshes with M. We saw the ruff near the nest, where the eggs were partly hatched; but some unfortunate accident had befallen them, as they were broken, the chicks dead, and the nest deserted. The ruff rose, and in flying away hovered suspiciously over a certain patch of grass, whence one of the reeves flew up, and on going to the spot M. found the second reeve's nest with three eggs, similar to those first described in ground colour, though not so heavily marked, and of rather smaller dimensions. We saw both the reeves, and No. 2 flew over our heads, calling out in a low tone, not unlike a godwit's, but more feeble. While we were watching the birds, some cattle that were pastured on the marshes approached the place, and, one of them coming in the direction of the nest, alarmed its owner, which flew at the beast's head in an excited manner that had the effect of turning it, otherwise the eggs would probably have been trodden upon.

May 29th.—On the marshes, I saw all three birds. No. 1 reeve was evidently nesting again; she flew round me for a long time, then settled on a bare patch of ground, and fell on her breast as though wounded, endeavouring to lure me from the locality. M. joined me about 6 p.m., and we watched the ruff and one reeve at quite close quarters. The ruff stood motionless, looking at the reeve, which continually ran in and out of the grass. No. 1 reeve had, doubtless, made another nest, and No. 2 was about to build again. We kept them under observation until about eight o'clock, when they departed to a swampy part of the ground to feed.

June 10th.—I had been from home for ten days, and was unable to visit the marshes until this date. C. had meanwhile found No. 2 female's second nest near the place where the first had been built, but, owing to the marsh being flooded by heavy rains, it was deserted. I photographed the nest and eggs, which C. then took.

June 21st.—M., C., and I were on the marshes. I discovered the third nest of No. 2 reeve, quite close to the same locality as the others. After photographing the eggs, I waited till the owner returned. This bird eventually hatched the eggs, but the second nest of No. 1 reeve was not located, although it is certain she got her young away, as one was caught by M., who liberated it again. Another very young bird was picked up, having been injured by cattle, and a third was procured when the shooting season commenced. Until the eggs were hatched, the male was always attentive to both sitting birds; afterwards he seemed to desert them entirely, and was last seen on July 16th, when both reeves had their offspring within a week of being able to fly.

An interesting scene occurred one day on the occasion of the ruff attacking a redshank that showed great solicitude about its nest and young in the vicinity of the reeves' nests; lowering its head and extending the ruff, with its bill pointed like a battering-ram, or a spike on a shield, it furiously rushed at the redshank, which nimbly sprang into the air and alighted a yard or two further away. The ruff continued its attacks most energetically, until the redshank was defeated and took its departure.

In the year 1903 the ruff and one female arrived in May, but, no doubt, having profited by their experience of the previous season, selected a different part of the marshes for their nest, and, despite the united efforts of my friends and myself to discover its whereabouts, we were obliged to confess ourselves outwitted. In 1904 no sign of either of the birds was seen, nor have they been observed since that time, and it is to be feared that some mishap has overtaken one or both of them during the autumn or winter season.

T. H. NELSON.

NOTE ON PRE-NORMAN REMAINS AT WELBURY.—During a recent visit to Welbury, I was informed that there were some carved stones in the greenhouse. I asked for permission to see them and found that two of the stones bore unmistakable marks of pre-Norman work. One forms the side or top limb of a cross ornamented with knot work, the other is a fragment of a much smaller cross of the cross patée type; this fragment has formed part of two limbs and a bit of the middle, there is no knot work upon it, but the remains of a more or less carved centre piece.

C.V.C.

CLEVELAND LEPIDOPTERA IN 1905.

By T. ASHTON LOFTHOUSE, F.E.S.

*Denotes Species recorded in our Proceedings for first time.

The conditions prevailing during the year were, on the whole, more favourable for insects than for some years previously. The early spring moths (*P. pedaria* and *H. leucophearia*) were noticed about the middle of February; a fair number of insects occurred on the "Sallows" in April; *Spring Larvæ* were fairly abundant in April and May; and *Sugaring* proved attractive at the end of June and early in July, but during August and the autumn months was most unproductive.

The season proved favourable for the smaller moths, and of these I have added a good many new species to our local list, one of them being an addition to the *Yorkshire* list, and one or two others are insects for which there are only one or two previous *Yorkshire* records.

Owing, probably, to the warmer weather prevailing during the summer, *N. dictæa* was bred on September 1st from *Larvæ*, taken in July, and one or two *Eupisteria obliterata* were bred as a second brood in September. The following insects also occurred as a second brood at sugar in September:—*M. brassicæ*, *N. plecta*, and *H. oleracea*, in addition to *A. segetum*, *A. suffusa*, etc.

NOCTUÆ. *Cymatophora duplaris*. Fairly common at sugar at Kildale, mostly dark forms.

Xylophasia hepatica. Noticed on sugar in garden at Linthorpe.

Apamea unanimitis. Noticed on sugar in garden at Linthorpe, and at Redcar.

**Celæna haworthii*. Worn specimen taken in September at Glaisdale. A single specimen on sugar in garden, Linthorpe, Middlesbrough, in 1906.

Noctua stigmatica. A few specimens taken at sugar near Kildale.

Calocampa vetusta. Single specimen taken at sugar at Linthorpe, on September 23rd.

Calocampa solidaginis. Specimen taken at sugar in garden, at Linthorpe, on September 1st.

GEOMETRÆ. **Eupithecia fraxinata*. Larvæ beaten out of ash at Kildale, in August.

**Eupithecia absynthiata*. Bred from Great Ayton and Eston larvæ taken off Ragwort flowers.

**Coremia munitata*. Female taken at Great Ayton.

PYRALIDES. **Pyralis costalis*. Specimens taken in outbuildings, Linthorpe, Middlesbrough, only recorded for two Yorkshire localities previously.

**Scoparia olivalis*. Kilton, Loftus.

**Scoparia prunalis*. Bred from monkshood in garden, Linthorpe.

PTEROPHORIDÆ. **Mimæseoptilus pterodactylus*. At Redcar, on July 3rd.

CRAMBIDÆ. **Crambus pascuellus*. Redcar.

**Crambus hortuellus*. Including dark melanic specimen at Kildale, in June.

TORTRICES. *Tortrix palleana*. Kildale.

**Peronea sponsana*. Middlesbrough; also at Guisborough in 1906.

**Peronea schalleriana*. Kildale.

**Peronea comariana*. Kildale in September. Only one previous Yorkshire record.

**Peronea hastiana*. Hibernated specimens taken in May, and a few very nice forms in the autumn, at Kildale.

**Peronea maccana*. Four or five specimens, including both sexes, taken at sugar, Linthorpe, Middlesbrough. This confirms my previous record (the only Yorkshire one), which was made from a single specimen taken some years ago.

**Peronea ferrugana*. Beaten out of spruce, Great Ayton.

**Teras contaminana*. Middlesbrough, Kildale, etc.

**Penthina variegana*. Linthorpe, Middlesbrough.

**Hedya neglectana*. Redcar.

**Mixodia schulziana*. Kildale.

**Orthotænia antiquana*. A fine specimen taken at Redcar, on July 3rd. This species is an addition to the Yorkshire list.

**Sciaphila conspersana*. Linthorpe, Middlesbrough.

**Phlæodes tetraquetrana*. Great Ayton, in October.

**Hypermezia angustana*. Redcar.

**Pædisca ophthalmicana*. Among Aspens at Kildale.

**Pædisca occultana*. Among Larch and Fir, Kildale,

Pædisca solandriana, Glaisdale. Common and very variable at Kildale in 1906.

**Ephippiphora brunnichiana*. Kilton, Loftus.

**Ephippiphora turbidana*. At Kildale in early July, flying in sun, about 5-30 p.m.

**Olindia ulmana*. Kilton Woods, Loftus, in July; also at Kildale in 1906.

**Catoptria fulvana*. Swainby in Cleveland, June 17th. Only one previous record in Yorkshire list.

**Argyrolepis cnicana*. Kilton Woods, Loftus.

**Conchylis straminea*. Redcar.

TINEÆ. **Tinea pallescentella*. Linthorpe (F. R. Atkinson).

**Swammerdamia combinella*. Kildale.

**Depressaria arenella*. Saltburn. Glaisdale.

**Bryotropha terrella*. Swainby in Cleveland.

**Æcophora stipella*. Kildale, in June.

**Glyphipteryx cladiella*. Kilton, Loftus.

**Argyresthia nitidella*. Middlesbrough.

**Argyresthia pygmæella*. Kilton Woods, Loftus; and Kildale.

**Coleophora cæspititiella*. Kildale.

**Lithocolletis frolichiella*. Kildale.

REPORT ON THE COLEOPTERA OBSERVED IN
CLEVELAND.

By M. LAWSON THOMPSON, F.E.S.

In the following report on Beetles occurring in the Cleveland District in 1905, I have not confined myself to notes on the species met with during that year. My purpose has also been (as in my previous report) to bring together in one place some additional, and at present, scattered information on local species, which shall contribute to our knowledge of the distribution of Coleoptera, as it affects our district.

The notes for 1906, however, refer strictly to that year, the species marked with an asterisk being new to Yorkshire, and therefore of some interest.

I had the pleasure of accompanying Mr. Richard S. Bagnall, of Winlaton-on-Tyne, on a short visit to Saltburn Wood in November, when the results of his work proved very gratifying.

COLEOPTERA.

Cicindela campestris, L.—Common on the Cleveland Moors.

Carabus violaceus, L.—Saltburn.

Notiophilus biguttatus, F.—Common in Cleveland.

Leistus rufescens, F., **L. ferrugineus**, L., and **L. fulvibarbis**, Dej.—Common at Saltburn.

Elaphrus cupreus, Duft.—Redcar, common on the margin of a large pond.

Elaphrus riparius, L.—Saltburn, on the margin of a large pond.

Badister bipustulatus, F.—Common at Saltburn.

Harpalus ruficornis, F., and **H. æneus**, F., (**proteus**, Payk).—Common at Saltburn.

Harpalus latus, L.—Common on Stanghow Moor, near Saltburn.

Stomis pumicatus, Panz.—Saltburn, under stones.

Pterostichus madidus, F., **P. vulgaris**, L., **P. Strenuus**, Panz., **P. diligens**, Sturm, and **P. striola**, F.—Common at Saltburn.

Pterostichus nigrita, F.—In Arncliffe Wood, Glaisdale; on Stanghow Moor, near Saltburn.

Amara fulva. De G., **A. apricaria**, Pk., and **A. plebeia**, Gyll.—All these species occur at Saltburn.

Calathus (Amphigynus) piceus, marsh.—In Saltburn Wood; also at Redcar. (W. C. Hey).

Taphria nivalis, Panz.—Saltburn, on the coast.

Anchomenus dorsalis. Müll., and **A. marginatus**, L.—Common at Saltburn.

Bembidium æneum, Germ.—Common on the margin of a large pond at Redcar.

Bembidium lampros, Herbst., and **B. littorale**, Ol.—Common at Saltburn.

Bembidium monticola, Sturm.—In Saltburn Wood, by the stream.

Bembidium mannerheimi, Sahl.—On Stanghow Moor.

Trechus obtusus, Er. and **F. secalis**, Pk.—Saltburn, single specimens.

Patrobus excavatus, Payk.—Saltburn Wood, by the side of the stream; Common; also Glaisdale.

Dromius linearis, Ol., **D. melanocephalus**, Dej., and **D. nigriventris**, Thoms.—Common at Saltburn.

Halplus ruficollis, De G.—Common at Saltburn.

Laccophilus obscurus, Panz., (**hyalinus**, De G).—Common at Saltburn.

Deronectes depressus, F., and **D. 12-pustulatus**, F.—Saltburn, in the stream.

Hydroporus lepidus, Ol., **H. palustris**, L., **H. erythrocephalus**, L., and **H. pubescens**, Gyll.—Common at Saltburn.

Hydroporus septentrionalis, Gyll., and **H. davisii**, Curt. Saltburn Wood, in the Stream (August, 1894).

Hydroporus dorsalis, F.—Common at Middlesbrough, in a pond.

Agabus nebulosus, Forst., and **A. Sturmi**, Gyll.—Common at Saltburn; also at Coatham Marsh. (W. C. Hey).

Platambus maculatus, L.—Saltburn, in the stream.

Ilybius fuliginosus, F., **I. ater**. De G., and **I. fenestratus**, F.—Common at Saltburn.

Colymbetes fuscus, L. Saltburn in a pond; Coatham. (W. C. Hey).

Dytiscus punctulatus, F.—At Saltburn, but not common.

Gyrinus natator, Scop.—Common at Saltburn; Redcar. (W. C. Hey).

Hydrobius fuscipes, L.—Common in Cleveland.

Anacæna globulus, Payk., and **A. limbata**, F.—Common at Saltburn.

Laccobius sinuatus, Mots., (**nigriceps**, Thoms.) and **L. alutaceus**, Thomas.—Both species occur at Saltburn, the first being common.

Limnebius truncatellus, Th.—Common at Saltburn.

Helophorus quaticus, L., **æneipennis**, Thoms., and **H. brevipalpis**, Bed.—Common at Saltburn.

Cercyon hæmorrhoidalis, F., **C. flavipes**, F., **C. lateralis**, Marsh, **C melanocephalus**, L., and **C analis**, Payk.—Common at Saltburn.

Aleochara lanuginosa, Grav.—Common at Saltburn.

Chilopora longitarsis, Er.—Common at Saltburn.

Homalota gregaria, Er. and **H. analis**, Grav.—Common at Saltburn.

Homalota elegantula, Bris.—Saltburn Wood (May, 1905).

Gnypeta labilis. Er.—Common at Saltburn, and on the margin of the Reservoir at Lockwood Beck.

Falagria sulcata, Payk., and **F. thoraica**, Curt.—Common at Saltburn.

Gyrophæna minima, Er. and **G. lucidula**, Er.—In Saltburn Wood.

Phytosus balticus, Kr.—Saltburn, on the coast.

Myllæna Kraatzi, Sharp.—Saltburn, on the margin of a pond. One specimen in July, 1894.

Hypocypus læviusculus, Mann.—Common at Saltburn: Redcar.

Cilea silphoides, L.—Saltburn, in dung.

Tachinus humeralis, Grav.—Common in Cleveland.

Quedius cinctus, Payk. (*impressus*, Panz), **Q. fuliginosus**, Grav., **Q. tristis**, Grav., and **Q. molochinus**, Grav.—Common at Saltburn.

Quedius boops, Grav.—On Easby Moor and Stanghow Moor; Common.

Creophilus maxillosus, L.—Common in Cleveland.

Leistotrophus nebulosus, E.—Saltburn, in decaying fish and garden refuse.

Staphylinus pubescens, De G.—Saltburn, in decaying garden refuse.

Staphylinus erythropterus, L.—On Stanghow Moor, under a stone (April, 1890).

Philonthus æneus, Rossi, **P. varius**, Gyll, **P. marginatus**, F., **P. cephalotes**, Grav., **P. sordidus**, Grav., **P. varians**, Payk., and **P. ebeninus**, Grav.—Common at Saltburn.

Leptacinus linearis, Grav.—Saltburn, on the sea banks, (1894).

Baptolinus alternans, Grav.—Common under loose bark in Cleveland.

Othius fulvipennis, F.—Common at Saltburn.

Lathrobium fulvipenne, Grav.—Common at Saltburn.

Lathrobium brunnipes, F.—Saltburn and Stanhow Moor; common.

Stenus guttula, Müll., **S. impressus**, **S. brunnipes**, Germ, Steph., **S. pubescens**, Steph., **S. nitidiusculus**, Steph., **S. picipes**, Steph., and **S. tarsalis**, Ljun —Common at Saltburn.

Bledius arenarius, Payk.— Common on the coast at Saltburn.

Platystethus arenarius, Fourc.—Common at Saltburn and Stanghow Moor.

Oxytelus sculptus, Grav., **O. laqueatus**, Marsh, **O. sculpturatus**, Grav., and **O. nitidulus**, Grav.—Common at Saltburn.

Lesteva pubescens, Mann.—Saltburn, at the foot of the sea banks, May, 1905.

Olophrum piceum, Gyll.—In damp places on Stanghow Moor.

Homalium rivulare, Payk.—Common at Saltburn.

Eusphalerum primulæ. Steph.—In flowers of the primrose at Saltburn.

Anthobium torquatum, Marsh, and **A. sorbi**, Gyll.—Common at Saltburn.

Liodes humeralis, Rug.—In Saltburn Wood.

Anisotoma lunicollis, Rye.—In the Proceedings for 1898 (p. 45) I recorded this species from the Saltburn Sandhills. This is an error and must be deleted, the specimen having since turned out to be a form of the very variable **dubia**.

Hydnobius punctatissimus, Steph.—On the Saltburn Sandhills, in October ; Common.

Necrophorus humator, Goez, and **N. ruspator**, Er.—Common at Saltburn.

Necrodes littoralis, L.—Saltburn, on the coast.

Silphar rugosa, L., and **S. atrata**, L.—Common at Saltburn.

Choleva cisteloides, Fröh., **C. nigricans**, Spence, **C. chrysomeloides**. Panz, and **C. fumata**, Spence.—Common at Saltburn.

Choleva kirbyi, Spence.—In decaying fungi, near Saltburn, (September, 1905.)

Adalia obliterata, L., and **A. bipunctata**, L.—Common at Saltburn.

Rizobius litura, F.—Common at Saltburn.

Coccidula rufa, Herbst.—Common at Saltburn, and in Coatham Marshes.

Hister 12-striatus, Schr., and **H. bimaculatus** L.—At Saltburn, in decaying garden refuse.

Epuræa diffusa, Bris.—Saltburn, by sweeping on sea-banks. One specimen in September, 1894.

Epuræa æstiva, L., and **E. melina**, Er.—Common at Saltburn.

Nitidula bipustulata, L.—Saltburn; Common.

Antherophagus nigricornis, F., and **A. pallens**, Gyll.—On Stanghow Moor.

Cryptophagus dentatus, Herbst, and **C. cellaris**, Scop.—Common at Saltburn.

Atomaria fuscipes, Gyll, **A. atricapilla**, Steph., and **A. analis**, Er.—Common at Saltburn.

Ephistemus globosus, Waltl.—On the Sea-banks at Saltburn. One specimen in June, 1893.

Dermetis lardarius, L.—At Middlesbrough, in bacon.

Cytilus varius, F.—On the sea banks at Saltburn.

Parnus auriculatus. Panz.—On the sea banks at Saltburn.

Aphodius lapponum, Gyll, **A. putridus**, Sturm, (**borealis**. Gyll), and **A. contaminatus**, Herbst.—Common in the dung of sheep on Stanghow Moor.

Aphodius fossor, L., **A. prodromus**, Brahm, **A. contaminatus**, Herbst, and **A. depressus**, Rug.—Common at Saltburn.

Cryptohyptnus riparius, F.—Under stones, &c., on Stanghow Moor; common.

Athous vittatus, F.—On young trees in Kilton Wood and Saltburn.

Limonium cylindricus, Payk.—Saltburn, on the sea banks.

Helodes minuta, L.—Common at Saltburn.

Cyphon coarctatus, Payk.—Common at Saltburn.

Podabrus alpinus, Payk.—In Saltburn Wood (on young oak) and on Stanghow Moor (on Whitethorn).

Telephorus nigricans, Müll, Var., **discoideus**, Steph., and **T. hæmorrhoidalis**, Fr.—Common at Saltburn.

Malthinus punctatus, Fourc.—Kilton Wood; Saltburn Wood; common.

Cis boleti, Scop.—Common in boleti on bark of rotten trees at Saltburn.

Octotemnus glabriculus, Gyll.—Common in boleti on old stumps at Saltburn.

Donacia versicoloreæ, Brahm, (**bidens**, Ol.)—Common at Saltburn, on Potamogeton.

Phytodecta olivacea, Forst, Var., **litura**, F.—Common on the broom near Saltburn.

Gastroidea polygони, L.—Common on Polygonum and Rumex at Saltburn.

Longitarsus lævis, Duft.—Common on Ragwort at Saltburn.

Phyllotreta undulata, Ruts, and **P. nemorum**, L.—Both species occur at Saltburn on Cruciferæ.

Batophila rubi, Payk.—Common at Saltburn on Rubus.

Sphæroderma testacea, F., and **S. cardui**, Gyll.—Common at Saltburn.

Crepidodera transversa, Marsh, **C. ferruginea**, Scop., and **C. rufipes**, L.—Common at Saltburn.

Psylliodes chrysocephala, L., and **P. cuprea**, Roch. (**cupronitens**, Forst).—On Cruciferæ at Saltburn; common.

Blaps mucronata, Lat.—Saltburn; Middlesbrough; common.

Tribolium ferrugineum, F.—In granary refuse at Thornaby-on-Tees.

Salpingus ater, Payk.—On Whitethorn on Stanghow Moor. One specimen in June, 1905.

Anaspis geoffroyi Müll, (*fasciata*, Foure).—On whitethorn blossom at Saltburn (June 1894).

Apion hæmatodes, Kirby, **A. viciæ**, Payk, **A. onopordi**, Kirby, **A. striatum**, Kirby, **A. immune**, **A. ononis**, Kirby, and **A. ervi**, Kirby.—Common at Saltburn.

Otiorhynchus atroapterus, De G., and **O. ovatus**, L.—Saltburn, on the sea banks; common.

Otiorhynchus ligneus, Ol.—Saltburn, on the sea bank, May, 1905.

Tropiphorus tomentosus, Marsh, (*elevatus*, Herbst).—Common on *Mercurialis perennis* at Saltburn.

Phyllobius argentatus, L.—Common at Saltburn.

Alophus triguttatus, F.—Saltburn, under a piece of wood, end of March, 1894.

Sitones puncticollis, Steph.—On Stanghow Moor; and at Saltburn.

Hypera punctata, F., and **H. plantaginis**, De G.—Common at Saltburn.

Pissodes pini, L.—Imported into Middlesbrough with timber from Northern Europe.

Dorytomus tortrix, L.—Saltburn, on aspens.

Dorytomus pectoralis, Gyll.—In Kilton Wood, on sallows, July, 1905.

Anthonomus rubi, Herbst.—Common on *Rubus* at Saltburn.

Cœliodes quercus, F.—On young oaks in Saltburn Wood.

Calandra granaria, L., and **C. oryzæ**, L.—Common in a granary at Thornaby-on-Tees.

1906.

Agabus biguttatus, Ol.—In a dried-up watercourse at Bosbeck, near Saltburn. Common in September.

Tachyusa atra, Grav.—Saltburn, on the sea banks, July.

Hypocyptus longicornis, Payk.—At Guisborough in August.

***Quedius fumatus**, Steph., (*peltatus* Er.) and **Q. umbrinus**, Er.—In Saltburn Wood, among dead leaves, November (Richard S. Bagnall).

***Quedius auricomus**, Kies.—In Saltburn Wood, in moss by the stream side, November (Richard S. Bagnall).

Choleva velox, Spence, and **C. wilkini**, Spence.—Saltburn Wood among dead leaves, November (Richard S. Bagnall).

***Ptenidium punctatum**, Gyll.—Saltburn, among seaweed on the shore (Richard S. Bagnall).

Cryptophagus acutangulus, Gyll.—At Saltburn in a porch. One specimen in October.

Cyphon variabilis, Thumb.—At Saltburn in July.

Donacia simplex, L.—In a pond at Saltburn; also found in Coatham Marshes (W. C. Hey, 1895).

Lema Lichenis, Vœt.—At Guisborough in August.

Luperus rufipes, Scop.—At Guisborough in August.

Cœliodes cardui, Herbst.—At Saltburn in May.

Poophagus sisymbrii, F.—In a pond at Saltburn in July.

Ceuthorhynchus quadridens, Panz.—At Saltburn in June.

Rhinoncus perpendicularis, Reich.—In a pond at Saltburn, July.

Phytobius quadrituberculatus, F.—In a pond at Saltburn, July.



CLEVELAND NATURALISTS' FIELD CLUB.

SECRETARY'S REPORT FOR 1904-5.

I have pleasure in presenting to the members of the Cleveland Naturalists' Field Club, the ANNUAL REPORT, this being my 7th Report and the 24th of the Club's existence.

SUMMER MEETINGS.—Seven Meetings were arranged by your Committee to be held during the summer months (exclusive of Yorkshire Naturalists' Union Meeting, none of which were held in the immediate vicinity).

The start was rather disastrous; the first meeting arranged to be held at Kettleness, and the second at Upleatham, had to be abandoned owing to very unfavourable weather conditions. This, unfortunately, did not end our misfortune in this respect, as the fourth meeting, arranged for Hilton, was abandoned from the same cause, and the sixth meeting at Kildale, the party only arrived to spend the afternoon indoors, owing to a very heavy thunderstorm coming on. If the Kilton meeting had not been altered on account of the Mayor's Garden Party, we would have had to chronicle yet another unfavourable day.

It is many years since the summer programme was so interfered with by the weather conditions, and this, in spite of the summer, generally, being much more favourable than had been the case in the two or three previous years.

Five Meetings were held, viz. :—at Kilton, Lealholm, Kildale, Eston and Kettleness, the latter being refixed again at a later date. The meetings held were fairly well attended: the meetings at Lealholm and Kilton Woods were the most successful.

The thanks of the Club are due to W. H. A. Wharton, Esq., Captain R. B. Turton, Lord Downe, Earl of Zetland, and the late Hon. James Lowther, for permission to visit their estates, also to Dr. Veitch for acting as guide of the Kettleness excursion.

WINTER MEETINGS.—Since the last Annual Meeting, 6 Winter Meetings have been held, these have, on the whole, been fairly successful and fairly well attended by our members, but still I consider there is room for improvement both in the attendance of our members and also for assistance by members in giving papers and assisting more at the microscope and exhibition meetings.

The Lectures that have been given since the last Annual Meeting are—a paper by Mr. W. H. Thomas, on “Earlier Civilizations of Ancient Greece,” delivered in April of last year. “The Underground Waters of N. W. Yorks.,” by the Rev. W. Lower Carter, M.A. F.G.S., on November 24th. “Plant Life on a Heather Moor,” by Dr. W. G. Smith, on February 9th, the two latter being given by Yorkshire Naturalists’ Union Lecturers. On March 23rd, a paper, entitled “Cleveland: its Geology and Scenery,” was given by Mr. J. S. Calvert, and illustrated by a very interesting series of sketches of local scenery.

Microscope and Exhibition Meetings were held on December 15th and January 28th, under the direction of Mr. Simpson and the Microscopy Sectional Committee. Exhibits were made by M. L. Thompson, J. M. Meek, Frank Elgee, and T. A. Lofthouse, and a number of our members and others kindly lent microscopes and slides.

All the Lectures were illustrated by lantern slides or diagrams.

MEMBERSHIP.—The Club membership is 111. This being, I regret to say, a slight decrease on last year, when the membership was 114.

Twelve new members have been elected during the year, 8 have resigned or left the district, 1 died, and 6 have been struck off owing to their subscriptions being in arrears.

The work that is being done by the Club is, I venture to think, worthy of more general support from the Cleveland district, and I trust members will do their utmost to induce any interested in Natural History or Archæological Pursuits, to join the Society.

PROCEEDINGS.—Since the last Annual Meeting, Vol. 1, part 5 of our Proceedings has been issued to members, together with index and list of members, this completing our First Volume.

The cost of Volume 1 in parts (5) has been reduced to 5/- to Members, and they may also obtain single parts at a reduction of 20 per cent.; as there are a fair number of copies of most of the parts in hand, I trust that members who have not complete sets, will avail themselves of the opportunity of purchasing them before the stock is exhausted.

Your committee appointed the Rev. J. Cowley Fowler, B.A., F.G.S., to the position of Editor, which, we are pleased to say, he has accepted.

LIBRARY.—The following works have been added to the Society's Library during the year:—Vol. 1, Part 2, of the Hull Society's Proceedings; Vol. 1, Part 2, of the Weardale Naturalists' Field Club Transactions, both presented by the Societies.

The Naturalist for 1904, and the Yorkshire Naturalist Union Transactions, Part 31:—

If the Society had a permanent room and Library accommodation (that is if there is a desire for such by the members), I think the Library is a portion of our work which might be further developed, and prove of practical use to our members.

SECRETARY'S REPORT FOR 1905-6.

I have pleasure in submitting the following Report, this being my 8TH ANNUAL REPORT, and the 25th year of the Club's existence.

While no great advance on previous years has been made, I think the value of the work done by the Club has been maintained. During the past 12 months, 7 Summer Meetings and 8 Winter Meetings have been held, and another part of our Proceedings has been published. The Club has had, I think, during the past year, more assistance from its members in arranging its Summer and Winter Meetings, than, has been the case in any previous year.

SUMMER MEETINGS.—The following Meetings have been held during the summer months; Upleatham, Crathorne and Hutton Rudby, Loftus to Grinkle, Swainby to Snotterdale, Danby to Castleton, and Stokesley to Wainstones. Two meetings on the fixture list were abandoned; the one from Ayton to Hutton on account of inclement weather, and the other owing to it being in "Stockton Race Week," when a good many of our members are usually away.

The districts visited were all interesting, some of them opening out quite new ground. A good attendance took place at all the meetings except Crathorne, which was interfered with by the weather. The Club was indebted to Mr. John Garbutt, of Loftus, the Rev. J. Cowley Fowler, Mr. J. W. R. Punch and Mr. Cozens, for acting as guides and giving information as to routes, etc., at the meetings at Grinkle, Swainby, Danby and Wainstones, their personal attendance and guidance adding very much to the interest of these meetings. The Rev. J. Cowley Fowler, our President, and Mr. and Mrs. J. W. R. Punch kindly entertained our members to tea at the Swainby and Danby meetings.

The Club was also indebted very much to local landowners, for permission to visit their estates on the occasion of our meetings, viz.:—The Earl of Zetland (on two occasions), Sir Chas. Mark Palmer, M.P., J. Lionel Dugdale, Esq. (who also kindly sent someone to meet the party, and explain to them the various objects of interest in Crathorne Church), and J. J. Emerson, Esq.

WINTER MEETINGS.—Since the last Annual Meeting, papers have been given at Winter Meetings by the Rev. J. Cowley Fowler, B.A., F.G.S., on "Brittany," in April; by Rev. W. Lower Carter, M.A., F.G.S., on "Early Man in Britain," Y.N.U. Lecture; by Rev. F. Grant James, on "Ancient Worthies of Marske"; and J. W. R. Punch on the "Spectroscope," illustrated by experiments; Thomas Sheppard, F.G.S., on a "Geological Ramble along the Yorkshire Coast," Y.N.U. Lecture; Two Microscope and Exhibition Meetings, and an evening visit to the Dorman Museum, completed the year's Winter Meetings.

Mr. Simpson kindly obtained the microscopes from members and friends, and arranged them for these meetings, with the assistance of Mr. Punch and other of our members. At the second of our Microscope Meetings, the members had the pleasure

of seeing Mr. Barnes' beautiful and instructive slides, mostly botanical, and principally illustrating "Mosses," with the life history of which he is well acquainted.

The attendance of members at most of the meetings was fairly satisfactory, although on the occasion of one or two meetings, other attractions and engagements probably militated against as good an attendance as might have been expected.

MEMBERSHIP.—The Club membership is 106, including 2 Honorary members. This being a slight decrease on last year, when the membership was 111.

During the year 10 new members have been elected and 9 members have resigned (mostly through leaving the district), 5 have been struck off for non-payment of subscription, and one member has died, namely, Col. Chas. Lothian Bell, a member who, although he did not attend the meetings, he was interested in the Club's work, especially the Proceedings, to the recent part of which he contributed a very complete Meteorological Record for Linthorpe, Middlesbrough, in 1904.

A satisfactory feature in regard to the membership during recent years is, that we are receiving a much more representative Cleveland membership than we have hitherto had.

I regret to say, that in my opinion, there seems to be a lack of active workers in "Natural History and Kindred Pursuits" in our midst at the present time, this is not as it should be, as Middlesbrough is favourably situated for all branches of Natural History. There seems to be no one working at the Mollusca, the Marine Fauna and Flora, and many other branches in which there is ample scope for workers in this district.

PROCEEDINGS.—Part 1, Vol. 2, of the Society's Proceedings has been issued to members during the year. This number is of particular local value, and has been favourably commented on in the Naturalist, Yorkshire Weekly Post, and other papers. All the papers were of local interest.

It is rather unfortunate that our membership is not large enough to permit of printing Proceedings every year as we have in hand at the present time, and could obtain from our members papers that would keep the Proceedings going for some considerable time.

The thanks of the Club are due to the Rev. J. Cowley Fowler, B.A., the Editor of Part 1, Vol. 2, and to all the members who contributed papers to the number.

The sale of the Proceedings, as will be noticed from the Treasurer's Report, is an increase on previous years, and if members would only make them more widely known, we should probably have a considerably larger income from this source.

LIBRARY.—The following Works have been added to the Society's Library during the year:—Vol. III., Part 3, of the Hull Society's Proceedings, and the Naturalist for 1905.

MUSEUM.—Mr. Baker Hudson has informed me that the Museum authorities have given permission to us to hold our meetings at the Museum, and have placed a room at our disposal when required. Under the Curator, Mr. Baker Hudson, and the Assistant Curator, Mr. Frank Elgee, the Museum collection is being got into shape, and will, no doubt, in time become of very valuable assistance to local students, and should also stimulate workers and possibly become the means of enlarging the Club membership, but to do this it must not be lost sight of that the collection should become more an index of the Natural Fauna and Flora of the Cleveland district, and the more this is kept in view the more valuable will the Museum, as an educational agency, become, in my opinion.



MEMBERSHIP.

Any persons interested in the work of our Society are invited to become Members, even if they are not able to be active Members. Their support would be valuable and would also show that the work of the Society was not altogether unappreciated.

The Annual Subscription is 5/-. Further particulars would be supplied by the Hon. Secretary.



PROCEEDINGS OF THE
CLEVELAND NATURALISTS' FIELD CLUB.

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Previous numbers of the Proceedings of the Cleveland Naturalists' Field Club may be obtained of the Hon. Secretary, Mr. T. A. Lofthouse, 129, Albert Road, Middlesbrough.

May 1. 09

PROCEEDINGS
OF THE
CLEVELAND NATURALISTS'
FIELD CLUB:

1907-8.

VOL. II. PART III.

Edited by the Rev. J. Cowley Fowler, B.A., F.G.S.

PRICE TWO SHILLINGS
(FREE TO MEMBERS.)

MIDDLESBROUGH:
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1909.



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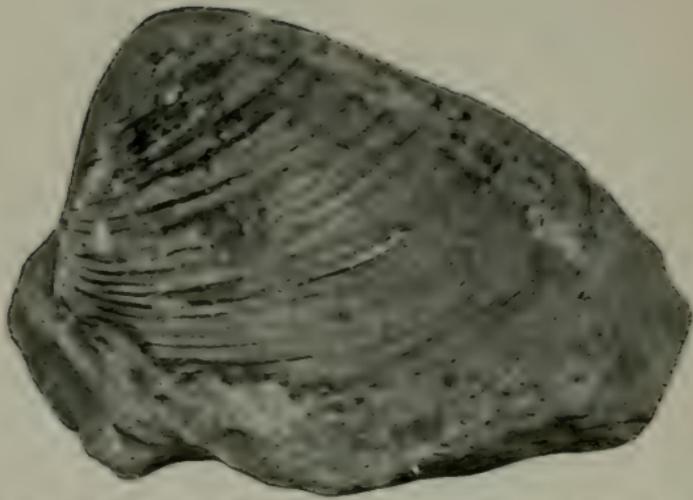
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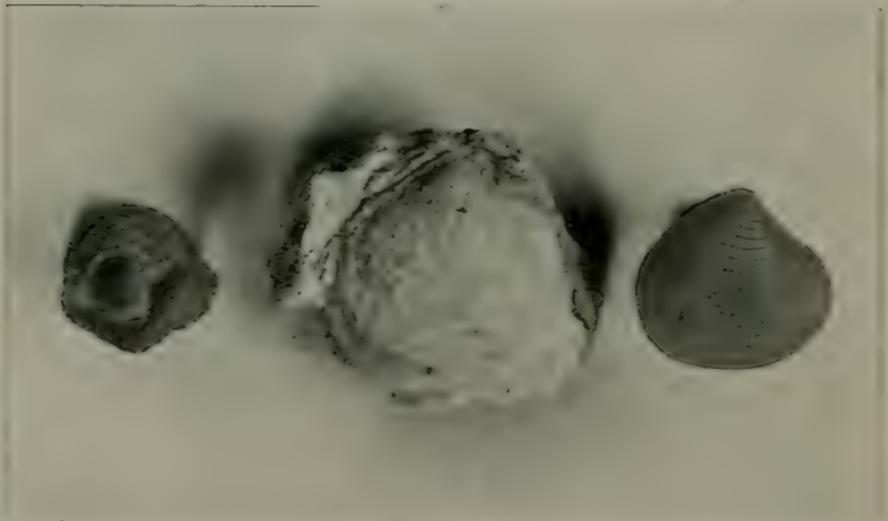


Trigonin hagenensis, MAIN SEAM OF IRONSTONE. MIDDLE LIAS.
ESTON MINES.

1

2

3



- 1 *Astarte striato-sulcata*, MIDDLE LIAS, CLEVELAND.
- 2 *Astarte duboisiana*, CORALLINE OOLITE, PICKERING.
- 3 *Astarte sulcata*, RECENT, REDCAR.

THE FAUNA OF CLEVELAND—PAST AND PRESENT.

 BY FRANK ELGEE.

CONTENTS.

1. INTRODUCTION.
2. THE MARINE FAUNA.
3. PAST MARINE FAUNAS.
4. THE TERRESTRIAL FAUNA.
5. THE HISTORY OF THE TERRESTRIAL FAUNA.
6. CONCLUSION.

1.—INTRODUCTION.

The history of the animals of our district, including those inhabiting both sea and land, is a subject which must be of interest to all the members of a society, having for one of its objects the investigation of the fauna of Cleveland. During the last few decades, the zoology and palæontology of North Eastern Yorkshire have been zealously studied by numerous enthusiastic observers, many of whom are prominent members of this society. Thanks to their labours, we now possess a tolerably comprehensive idea of the character of the local fauna, its constituent species, and their local distribution—though it must be admitted that very much more work remains to be done, before our knowledge of it can be regarded as anything like complete. Nevertheless, an attempt will here be made to survey the zoology and palæontology of Cleveland as a coherent whole; to consider the distribution of the various animals in space and time; to ascertain the elements of which the fauna is composed, and the natural groups into which it can be divided; and to trace the faunas that have at different periods lived within the district.

As will be gathered from the statistical tables given in this paper, the fauna of Cleveland, both recent and fossil, is a very rich one, nearly four thousand species having been recorded. This richness is primarily due to the great variety of natural habitats the area possesses, each one of which is inhabited by a special suite of animals. For not only is there a varied coast-line with sheltered bays, low sandy shores, a tidal estuary, precipitous cliffs, and long stretches of intertidal sears; but there is likewise a varied land surface with hills and valleys, woods and moors, swamps and streams. To the residents have also to be added the animals which visit these localities, either as regular immigrants, casual visitors, or as accidental introductions by man. On turning to the rocks of the district we find that they contain a great suite of organic remains, numbering over a thousand species occurring in groups in the different strata, and now all extinct.

Regarding this fauna as a whole we shall deal with it from two standpoints, the statical and the dynamical. The statical aspect treats of the fauna as it is at present, its species and their local distribution, its divisions into natural groups or associations, and the likenesses and differences of these groups as compared with one another, and to similar and dissimilar groups in this and other countries.

The dynamical aspect of the fauna treats of the history of the animals which have lived within the district and their origin: the lines of past migration and distribution, and the changes the fauna has undergone in relation to past climates, and past vicissitudes of geography. In other words, it deals with the evolution of the fauna, and the causes which have contributed to that evolution.

It will be convenient to consider first the present marine fauna, to see of what species it is composed, and their status on the district coast-line. Unfortunately, it will not be possible to treat of the divisions of the marine fauna into groups or associations, corresponding with the different habitats of the different species, since few observations except those of a very general kind have been made on this subject.

We shall next pass on to the history of the marine animals of the Cleveland coast, and ascertain the period when they entered the district. We shall then discuss the past marine

faunas of Cleveland, as revealed by a study of the fossils in the local strata, and the conclusions to be drawn therefrom regarding past climatic and geographical conditions.

The terrestrial fauna will next be dealt with, which will furnish data for its history during recent geological periods. Finally will come a resumé of the marine, the fossil, and the terrestrial faunas as a whole.

2.—THE MARINE FAUNA.

The annexed table No. 1 gives so far as I have been enabled to ascertain, a census of the species and genera of marine animals, occurring on or off the coast as far south as Whitby. The figures there shown cannot be otherwise regarded than as considerably below the actual number inhabiting the coast-line; since there are many groups of marine animals which have hardly received any attention from local naturalists. This table does not call for any special comment at our hands, but it will be noticed that it shows the fishes and the mollusca are the most numerous forms of life on our coast-line, so far as number of species is concerned.

TABLE I.

CENSUS OF THE MARINE FAUNA OF CLEVELAND.

CLASS.	SPECIES.	GENERA.
Mammalia	4	2
Reptiles	1	1
Fishes	131	79
Crustacea	44	33
Tunicates	1	1
Cephalopods	4	4
Univalves	59	43
Bivalves	53	33
Polyzoa	31	17
Worms	15	15
Echinoderms	16	11
Medusæ	2	2
Hydrozoa	37	18
Actinozoa	9	6
Sponges	2	2
Protozoa	4	4
Total	413	271

▮ This marine fauna can be divided into groups according to the status of the various species, whether these be residents, migrants, irregular visitors, or accidental stragglers. The first of these include most of the familiar fishes, molluscs, echinoderms, worms, and sea anemones of our shores; and these animals, especially the mollusca, can be further subdivided into groups, corresponding to the geographical regions to which they belong. Generally speaking the molluscan fauna of Great Britain, forms part of the Celtic Province of marine conchologists. This province also includes the coasts of the North Sea, the Baltic, Sweden, and Denmark. Local species characteristic of this geographical region are *Cardium edule*, *Mya arenaria*, *Mytilus edulis*, *Pecten maximus*, *Ostrea edulis* and numerous others.

Intermingled with these Celtic species are others ranging much further northwards, and generally typical of the Boreal and Arctic Provinces. To the first of these provinces, corresponding to the west coast of Norway, Iceland, the Shetland and Faroe Islands, and the north coast of North America, belong such local molluscs as *Eolis despecta* and *Doto fragilis*, two sea-slugs; *Buccinum undatum*, *Littorina rudis*, *Lacuna divaricata*, *Skenia planorbis*, *Gibbula cineraria*, *Modiolaria discors*, and *Solen ensis*; and the species which range into the Arctic Province and there mix with true Arctic shells, include *Chrysodomus antiqua*, *Sipho islandicus*, *Nassa incrassata*, *Acmca testudinalis*, *Turtonia minuta*, and *Saxicava rugosa*,

Two species found at Redcar may be cited as examples of forms, which extend southwards into the Lusitanian Province; an area embracing the Mediterranean and the coasts of France and Spain. These two species are *Chione gallina* and *Tellina tenuis*.

In a similar manner the other marine organisms of our coast might be classified, but it must be carefully borne in mind that such divisions are not exact. Owing to the absence of barriers to dispersal marine animals often have a very much wider geographical distribution than land animals. Hence some marine shells are genuine cosmopolitans, being found in all seas. The Common Mussel (*Mytilus edulis*) and the Boring Shell (*Saxicava rugosa*) are said to belong to

this class, and there can be little doubt that their distribution is practically world-wide.

Accidental stragglers to our coast are not infrequent, and the only marine reptile given in the table may be taken as an instance, viz.: the Hawk's Bill Turtle (*Chelone imbri-cata*), a resident of tropical waters, found dead off Redcar in 1849. Other rare stragglers are the Opah or King Fish (*Lampris luna*), of brilliant colours, a native of the Atlantic and Pacific Oceans: the Tunny (*Thunnus thynnus*), a warm-blooded fish: the Pilchard (*Clupea pilchardus*): and the Basking Shark (*Cetorhinus maximus*), the latter being the so-called "grampus," which created such a sensation on Redcar Sands two years ago.

Concerning the history of the marine fauna of Cleveland very little can be said here. We may endeavour to find out, however, the period when the animals first appeared on our coast. Of course, the obvious answer to this problem is, after the North Sea was formed, but when this took place the geologist can only assign a relative date. That the North Sea existed in pre-glacial days is certain, and that it contained a fauna even richer than the present one is also certain. For in those well-known formations of Pliocene times—the Craggs of Norfolk and Suffolk—are to be found shells precisely similar to those in the present sea, together with species now extinct or living elsewhere, and indicating a somewhat warmer climate. In many of the glacial beds of the Cleveland district, fragmentary shells of *Cyprina islandica*, *Tellina balihica*, and *Dentalium entalis* are of frequent occurrence, and they also prove the existence of the North Sea in pre-glacial times from the bed of which they were carried by the great northern ice-sheet. For during the Ice Age it seems fairly well established that the German Ocean was filled with thick glacier-ice, and that consequently the pre-glacial marine fauna was either driven away southwards or became extinct locally: but with the retreat of the ice and the gradual amelioration of the climate, the various species would return to repopulate their old haunts. We have to picture to ourselves this great movement of marine animals, some creeping from rock to rock along the coast, others being carried helplessly by the currents and tides, and yet others actively swimming through the water. At first the northern forms now confined to the Arctic Province

would prevail, to be followed by the more temperate types of the Boreal and Celtic Provinces. With the retreat of the ice beyond the point where the North Sea becomes one with the Atlantic, an influx of animals would then ensue from the north which continues at the present time.

According to the eminent French conchologist, M. Paul Fischer*, the Straits of Dover are somewhat of a barrier to a large number of shells peculiar to the Lusitanian Province, or otherwise they would extend into the North Sea, and this may perhaps explain the rarity of Lusitanian forms on the Cleveland Coast. But if this barrier has been effective with one group of shells, it seems difficult to understand why it should not have been effective with the Celtic and Boreal groups, as they spread northwards after the Ice Age. This may have been so, but in that case the marine fauna must to a great extent have entered the German Ocean from the north, as just described. Movements of marine animals through the Straits of Dover northwards, and from the Atlantic southwards, must have taken place, though perhaps on a smaller scale in the former than in the latter. Again, these distributions would be interrupted by the conversion of the sea floor into dry land, an event which certainly occurred in post-glacial times. After the subsidence of the land the sea would once more prevail and bring with it its inhabitants.

Thoroughly to trace the history of the marine fauna, we should have to investigate the geographical distribution of every species, and that of the genus to which it belongs. Next we should have to ascertain the distribution of the genus in time, and find out at what geological epoch, and in what country it became most numerous in species. Only after we had collected this vast body of facts, would we be in a position to discuss the history of our local marine fauna. To do so here is out of the question, but to illustrate this line of research let us take the case of the genus of bivalve shells known as *Astarte*, of which two species have been recorded from the coast, *A. sulcata* and *A. compressa*. The first of these ranges far north to Novaya Zemlia, the White Sea, and North America, and extends southwards to the Canaries and throughout the

* Manuel de Conchyliologie, p. 145.

Mediterranean ; the latter also extends far north to Greenland and Novaya Zemlia and according to Gwyn Jeffreys, is extensively distributed throughout the North Atlantic to the North Eastern Coast of America.

Besides these two local species there is another. *A. triangularis*, found locally on all the British Coasts and extending to the Canaries ; whilst about twenty other species flourish in the Northern and Arctic Seas of Greenland, Iceland, Norway, Northern Europe, and North America. Thus it will be seen that the genus at the present day is of essentially northern distribution, and associated with cold climates.

Turning now to the palæontology of the genus, we find that the three British species are found fossil in the Pliocene deposits of Norfolk and Suffolk, where, however, they occur with nearly twenty other species most of which are extinct. Further back in time the living forms do not go, and omitting the Miocene *Astartes* which do not occur in Britain, we meet with the group again in the lower Eocene beds of the South of England, whence half-a-dozen species have been recorded.* It is also numerous in the Tertiary deposits of the Continent and North America. In these formations, however, it is associated with animals and plants having a decidedly tropical aspect, indicative of warm climates.

Several species occur in the Cretaceous formations, but not until the Jurassic is reached does the genus attain its maximum dimensions. In this great geological system, the species are perhaps most numerous in the Upper Corallian and Lower Kimmeridgian strata, where they are so abundant that they constitute a definite geological horizon, known to continental geologists as the Astartian. Even in the Upper Oolitic strata of North Eastern Yorkshire they are comparatively abundant, over a dozen species having been obtained, and of which the commonest is *Astarte duboisiana* from the Coralline limestone of Pickering and neighbourhood. Altogether nearly 300 species of fossil *Astarte* are known and attain their maximum development in the Secondary

* Bullen Newton, Catalogue of British Eocene and Oligocene Mollusca.

Period, where, however, they are found in deposits, not only indicating a warm climate but actually forming the fossilized remains of coral reefs such as we find at Hackness, East Ayton, and Pickering.

The genus *Astarte*, according to Von Zittel, is first definitely known from the Triassic formation. It then gradually began to increase in numbers, and reached its maximum growth in adaptation to the warm tropical seas of later Jurassic times. After this epoch it slowly but surely begins to decrease, probably not so much owing to the varied changes of geography and climate which the genus witnessed (though these factors have doubtless played some part in its diminution), but perhaps owing to the competition of more vigorous molluscs and animals. The pressure of these rivals may have caused the present descendants of the semi-tropical Jurassic *Astartes* to become adjusted to the colder seas of the Northern Hemisphere, and that far from regarding these seas as the original home of the genus, we must probably place it, so far as our continent is concerned, in Central Europe in late Jurassic times. The present forms, including our two local species, are the relicts of a once numerous family of semi-tropical shells.

We thus see that the common shells we so carelessly crush with our feet on the sea shore, have a very complex history extending many millions of years into the past, and of which we can only form a very indefinite idea. What has just been said is applicable to every marine animal on the Cleveland Coast; for some, an imperfect picture of their evolution can be formed, for many others even this imperfect picture is an impossibility, since all or nearly all records of their enormous past have vanished for ever.

3.—PAST MARINE FAUNAS.

What we have just considered concerning the geological history of *Astarte*, naturally leads us to the third division of our subject, the past marine faunas of Cleveland. Although we have learned that the present marine fauna has undergone many vicissitudes in its development, we have yet to see that our district was occupied by many marine faunas, not

only altogether different from the present, but also very different from one another. To do this we must go back to that far distant time when Cleveland was under the seas of the Mesozoic or Secondary Epoch. No Quaternary or Tertiary deposits exist in our area, so that the history of the past marine faunas is necessarily very imperfect, and has to be filled in with details drawn from other parts of the country. It is proposed, however, to contrast the fossil animals of the local stratified rocks with those inhabiting the coast to-day, ascertain in what way they differ or agree, and see what conclusions can be drawn from them regarding the climate of Cleveland when they flourished.

TABLE II.
CENSUS OF THE FAUNA OF THE LIAS.

CLASS	SPECIES	GENERA
Pterosaur	1	1
Crocodylia	7	3
Plesiosaurs	9	3
Ichthyosaurs	7	1
Fishes	20	12
Crustacea	23	9
Insects	2	2
Cephalopods (other than Nautili Ammonites and Belemnites)	4	3
Nautili	7	1
Belemnites	41	1
Ammonites	117	7
Univalves	86	19
Scaphopods	5	1
Bivalves	190	42
Lamp Shells	27	7
Worms	10	3
Echinoderms	20	14
Corals	4	2
Protozoa (Foraminifera)	74	21
Total	654	152

The New Red Sandstone of the Triassic System, which underlies the lowlands of Tees-side, contains no local organic remains of enough importance to be considered here. It may be remarked in passing, however, that these rocks are composed of sand formed under desert conditions, and probably blown by the wind into lakes saturated with salt, now lying at a depth of nearly two thousand feet. Succeeding the Triassic rocks comes the well-known Lias, but the change of geographical condition which first supervened, is indicated by a set of beds termed the Rhætic (after the Alps of that name where they are characteristically developed), containing a few stunted marine fossils. Of these the most important is the shell known as *Avicula contorta*, remarkable for its wide distribution in various parts of Eastern, Western, and Southern Europe, of course on the same geological horizon. The teeth of Sharks are of frequent occurrence, and are of interest from the fact that their nearest living representative, is the Port Jackson Shark of the Australian Seas.

With the Lower Lias, so picturesquely developed on the scars at Redcar, Saltburn, and Robin Hood's Bay, we are introduced to a rich and varied fauna, the statistics of which can be gathered from Table 2. On comparing the fauna of the Lias with that of the Cleveland coast, we find that the number of species in the former is greater than in the latter. But as we have seen the full number of living species is still far from being known, if these could be enumerated the total would probably be greater than that for the whole of the Lias.

This comparison would be misleading, however, if we do not bear in mind the fragmentary character of the fossil faunas. This imperfection of the geological record is owing to the circumstance that only animals which secrete hard parts leave any remains in the stratified rocks, such soft-bodied organisms as jelly-fish, worms, and sea-slugs, disappear altogether, and many other animals must, though possessing hard parts, decay away before they can become petrified. Joining these considerations with the long period of time during which the Lias was laid down, we may feel sure that animal life was more abundant in those days than it is now, as far as the immediate district is concerned.

The differences of the Liassic Fauna from the present one constitute those palæontological features so characteristic of the Mesozoic ages. None of the species except perhaps a few Foraminifera are now living, and of these, whole groups have become extinct; the Reptilia, the Ammonites, and Belemnites being the most noteworthy. With regard to the Mollusca other than the Cephalopods it has to be remembered that, including Inferior Oolite forms, thirty-four genera of them are extinct; whilst twenty-three genera presently to be dealt with in detail although still living, are non-existent in the British area. The nearest points of resemblance between the living and the fossil faunas, is in the occurrence of a number of genera still represented on our coast, such as *Mytilus*, *Pecten*, *Ostrea*, *Modiola*, and *Littorina* amongst the Mollusca.

Let us now take a brief survey of the succession of marine faunas whose records are to be found in the Lias and the Inferior Oolite of the district. Beginning with the Lower Lias, the most remarkable zoological feature it possesses is the great abundance of what are known as the Arietan Ammonites, characterised by their keeled and radiately ribbed shells. *Arietites Bucklandi* from the rocks on which Redcar Pier stands, is a familiar type. Now, the Rhætic Beds below the Lias contain no Ammonites at all, yet on ascending through a few feet of strata, we come across them in swarms. What, therefore, is the implication of this fact? Well, probably that the conditions of life during the deposition of the Trias in England, were unfavourable to their existence, and that the Ammonites entered the Cleveland Liassic Sea from elsewhere. The researches of an eminent continental geologist, Von Mojsisovics, have shown that these chambered shells attained their maximum development, not in the Lias, but in the open Triassic Seas of South Europe, Asia, America, and the Arctic Regions; during which epoch over one thousand species belonging to over thirty distinct genera flourished. With the disappearance of the unfavourable conditions existing in our district during Triassic times, the Ammonites invaded the Liassic Seas from the south, west, or east, but probably not from the north, where there is supposed to have been a land surface.

Associated with the Arietan Ammonites are other genera of Molluscs, including the familiar Miller's Thumb (*Gryphæa*

arcuata), a species of oyster, strictly confined to the Lower Lias, and forming hard scars of limestone at Redcar. Amongst the other bivalve shells of the Lower Lias *Cardinia*, is most noteworthy and characteristic, though now quite extinct. The beautiful univalve, *Pleurotomaria anglica*, is somewhat numerous at Redcar, and belongs to a genus which is abundant in the stratified rocks, but is at the present time almost extinct, a few living examples having been found in the Antilles and Japan.

The nature of the Lower Lias rocks, shale with thin bands of limestone, indicates the conditions of life at that epoch, viz., moderately deep water, clear when the limestone bands were formed, and muddier when the shales were deposited. In the Middle Lias still shallower water existed, as is testified by the ripple marked sandstones of the Sandy Series, with their oyster beds and swarms of *Cardium truncatum*. These littoral conditions were followed by deeper water in which the shaly beds of the Ironstone Series were deposited, a life condition which prevailed up to the close of the Liassic period.

In the Middle Lias, which includes the Ironstone Series, we are confronted with a rich and varied fauna quite different from that of the Lower Lias. Not only have nearly all the species died out which are characteristic of the inferior beds but also whole genera. The Arietan Ammonites, so numerous in the Redcar Rocks, are replaced by species belonging to new genera. Of these *Egoceras capricornus*, and *Amaltheus spinatus*, may be taken as typical examples. The *Cardinias* are reduced to one or two feeble representatives, whilst peculiar genera of bivalve Mollusca become very dominant, viz.: *Gresslya*, *Pleuromya*, *Goniomya*, *Arcomya*, *Ceromya*, and *Pholadomya*. All of them are extinct, except *Pholadomya*, two or three species of which have been dredged from the bottom of deep parts of the Atlantic.

A famous bivalve of the Ironstone is *Trigonia lingonensis*, one of the earliest members of a genus which attained an extraordinary and beautiful development in later Jurassic times, but is now only represented by a few species in

the Australian Seas. This rare shell is practically confined to the Ironstone of Eston and Upleatham Hills, but specimens have been obtained at Boulby and Roseberry Topping. Not only is it of great rarity but it is seldom found with both valves in opposition.*

The Brachiopoda, or Lamp Shells, are not uncommon in the Ironstone Beds though scarce in the North Sea to-day. The familiar *Rhynchonella tetrahedra* is very abundant and frequently occurs in pockets, whilst *Terebratula* is also numerous. Table No. 3 shows the fauna of the Ironstone Series of the Middle Lias.

TABLE III.

CENSUS OF THE FAUNA OF THE IRONSTONE SERIES OF
THE MIDDLE LIAS.

CLASS.	SPECIES.	GENERA.
Reptiles	2	2
Cephalopods	16	3
Univalves	23	10
Bivalves	62	35
Lamp Shells	11	4
Worms	4	2
Echinoderms	3	3
Total	121	59

In the Upper Lias, we meet with another distinct group of fossils. New genera of Ammonites, *Stephanoceras*, *Phylloceras*, and *Harpoceras* abound together with many unique bivalves, such as *Inoceramus dubius* from the Jet Rock; *Leda ovum* and *Trigonia literata*, from the Alum Shale. Fishes are comparatively numerous in the jet shales, and com-

* Mr. T. W. Saunders, of Saltburn, has a beautiful and perfect specimen found by him in Boulby Mines.

prise forms (*Leptolepis saltviciensis*) related to the Herring, and others related to the Sturgeon and the Bow-Fin of the United States.

But it is for the Reptiles that the Upper Lias is so celebrated, and the species which then flourished are now extinct. The most important of them are undoubtedly the Fish Lizards, or Ichthyosauri, of which six species have been obtained from the Upper Lias of Cleveland. The Ichthyosaurus was a huge carnivorous animal, often attaining a length of twenty feet, and it is worthy of note that these great marine reptiles were of a very fish-like shape and even provided with fins, as some specimens from the Lias of Württemberg have shown.

Less numerous in species than the Fish Lizards and probably less ferocious, were the Plesiosaurs, differing from the former in having long flexible necks. Besides these there were several reptiles closely related to the modern Crocodiles, as well as Flying Dragons (*Scaphognathus*), the remains of which have all been discovered in the Alum Shale.

There is a curious feature connected with the fauna of this stratum, tending to show that even in a limited area like Cleveland, different conditions of life must have prevailed even during the deposition of one bed. At Peak and Whitby, and along the coast generally, the common fossils of the Alum Shale are extremely numerous, but on Carlton Bank they are very scarce, even *Leda ovum*, the typical bivalve of the horizon, being very far from abundant. Evidently the life conditions must have been less favourable in the western, than in the eastern part of our area during Upper Liassic times.

The fauna of the Inferior Oolite (see Table 4) is less rich than that of the Lias, owing to the Estuarine conditions under which it lived. The records are to be found in thin marine strata intercalated between massive grits and sandstones, the chief of them being the Dogger, the Eller Beck Bed, the Millepore Bed, and the Grey Limestone Series. Different suites of animals occur in each of these, and the most striking feature of the Bajocian fauna as a whole, is its richness in bivalves, in this respect even exceeding the Lias.

TABLE IV.

CENSUS OF THE FAUNA OF THE INFERIOR OOLITE.

CLASS.	SPECIES.	GENERA.
Reptiles	3	3
Fishes	3	3
Nautili	2	1
Belemnites	7	1
Ammonites	16	5
Univalves	81	27
Bivalves	216	48
Lamp Shells	26	6
Polyzoa	3	3
Crustacea	7	5
Worms	9	3
Echinoderms	20	14
Corals	7	6
Total	402	125

Before concluding this section, attention must be directed to certain conclusions that may be drawn from the fossils of the Lias and Oolite. The following genera of shells though found fossil in the district, are also found living in tropical and semi-tropical seas at the present time.

<i>Nautilus</i>	<i>Anatina</i>
<i>Pleurotomaria</i>	<i>Cardita</i>
<i>Nerita</i>	<i>Corbis</i>
<i>Neritopsis</i>	<i>Cucullæa</i>
<i>Onustus</i>	<i>Cypricardia</i>
<i>Phasianella</i>	<i>Cytherea</i>
<i>Pitonillus</i>	<i>Macrodon</i>
<i>Turbo</i>	<i>Solenomya</i>
<i>Hinnites</i>	<i>Trigonia</i>
<i>Perna</i>	<i>Waldheimia</i>
<i>Plicatula</i>	<i>Lingula</i>

They seem to indicate that the climate of Cleveland during Mesozoic Ages, was distinctly warmer than it is to-day. This inference receives verification from the fossil Cycads of the Oolite, and the famous Coral Reefs of the Tabular Hills.

Against these tropical genera, have to be set thirty-seven genera of Molluscs still living in British waters, but as these are existent in nearly all seas, they rather help than contradict the general verdict of the local fossils. The abundance too, of a rich Cephalopod fauna, as well as the number of Reptilian types, tends to show the favourable conditions for marine life during Liassic times.

Another feature of the Liassic fauna is the extraordinary change of life forms, in comparatively speaking, such a small vertical thickness of rock. Liassic rocks a few hundred feet thick show, not merely change of species, but in some instances change of genera; the differences between the Redcar Rocks, and the Ironstone Series, being both striking and remarkable with the *genera* of the Ammonites, and the *species* of Bivalves. From the pre-glacial Craggs of Norfolk and Suffolk, we know that these beds indicate a marine fauna similar to that of to-day, in fact the same, so far as the species of Mollusca are concerned. The time, however, since the Craggs were deposited must be very considerable, perhaps tens of thousands of years. If in the case of the Craggs, after the lapse of tens of thousands of years, little if any change even in species has occurred, how long a period of time must have elapsed during the deposition of the Lower and Middle Lias, to permit of such great evolution of form?

This remarkable change in form is best illustrated by the Ammonites, of which nearly 120 species have been described from the Yorkshire Lias alone. As is well-known the majority of the species are confined in groups to separate beds or zones. Twelve such zones have been determined in the Lias of Cleveland, each characterised by a special Ammonite, or set of Ammonites. Hitherto, no explanation has ever been afforded of these peculiarities of geological distribution. Before any solution can be attempted, the following factors ought to be borne in mind.

Each zone or bed of the Lias was deposited under different conditions of sedimentation, and to these conditions is undoubtedly due the ordinary palæontological features of the strata. This alone cannot have been sufficient to produce the great generic distinctions of the Ammonites. A more important factor must have co-operated with the changing

life conditions, viz., the high organisation of these curious Molluses. They constitute an important section of the highest class of the Mollusca, the Cephalopods, which with the exception of Insects, must be ranked amongst the most complicated and highly organised Invertebrates. Complexity of organisation is accompanied with greater delicacy, if we may so term it, of physical constitution, which being adjusted to numerous external conditions is singularly liable to be overthrown by changes in the environment. Consequently in the case of the Ammonites, these changes of environment indicated by the varied strata of the Lias, joined with the long period during which the rocks were deposited, may have led to more rapid modifications of form as compared with the other classes of Molluses.

4.—THE TERRESTRIAL FAUNA.

TABLE V.

CENSUS OF THE TERRESTRIAL FAUNA OF CLEVELAND.

CLASS.		SPECIES.		GENERA.
Mammals	...	25	...	15
Birds	...	249	...	175
Reptiles	...	5	...	4
Amphibia	...	5	...	3
Coleoptera	...	930	...	330
Lepidoptera	...	610	...	270
Land Snails	...	73	...	24
Freshwater Bivalves	...	9	...	5
Total	...	<u>1,906</u>		<u>826</u>

On the annexed table is summarised the chief results of the researches of zoologists on the land fauna of the district, from which may be obtained a fairly comprehensive idea, of the total number of species of all classes of the animal kingdom, to be found in Cleveland or which have visited Cleveland. Although the figure there given, 1,900 species, seems a large

one, yet it must be far below the actual total. The Mammals, Birds, Reptiles and Mollusca, cannot be very much increased, if at all, but the Insecta with further research will perhaps be more than doubled. For not only are the figures of the Lepidoptera and Coleoptera by no means complete, but the great orders of Hymenoptera, Diptera, Hemiptera, and Orthoptera have as yet few or no records. It will be noticed too, that there are no records of Spiders, Land Crustaceans, Earthworms, and other low forms of animal life, but which if the species could be enumerated would still further swell the total. Taking everything into consideration, it may be roughly estimated, that between four and five thousand species of animals inhabit Cleveland to-day.

This fauna can be classified according to the status of the various species composing it, viz. :—

- Introductions by Man.
- Accidental Stragglers and Visitors.
- Irregular Visitors.
- Regular Visitors.
- Resident Species.

This classification, as we shall see further on, provides a partial solution to the manner in which animals, now resident, may have entered the district. Neglecting, therefore, the various classes of visitors for discussion in the next section, let us devote some attention to the residents, since these offer many suggestive problems for investigation.

Though the highest point of Cleveland, on Urra Moor, is but 1,489 feet, still many interesting facts illustrate the altitudinal range of local animals. Thus, the Mole, the Angles Shades Moth (*Phlogophora meticulosa*), and the Black Slug, ascend from sea-level almost to the highest watershed. I have noticed the Mole on grassy moorland slopes, at 1,200 feet, near Ralph Cross, Castleton; the Moth (essentially a lowland species not dependent on ericetal plants for its food, and therefore a straggler to the uplands), on the promenade at Saltburn, and on Kildale Moor (1,000 feet); whilst the slug (*Arion ater*) can often be seen crawling on the peaty soils of the hills. The Mole, however, appears to be absent from the true heather moors, perhaps owing to the general

absence of earthworms. The non-occurrence of the earthworm on peaty moors, is probably due to the nature of the soil, but its absence from them must be of no little account in explaining their botanical aspect.

In investigating the vertical range of animals, more especially invertebrates, in Cleveland, distinction must be made between stragglers to the uplands, and residents on the uplands. The higher watershed between the great dales has not yet been explored by zoologists, and will probably yield rare and interesting species throwing light on the zoological evolution of the district. A few cases are on record of essentially moorland insects occurring in the lowlands, where they cannot possibly have bred since their special food plants are wanting. Thus, the Cotton Grass Moth (*Celæna Haworthii*) frequents boggy places on the hills, where *Eriophorum* grows and on which its larvæ feed. Nevertheless, specimens have been taken by Mr. T. A. Lofthouse, F.E.S., in his garden at Linthorpe, and Emperor Moths (*Saturnia pavonia*) have also occurred at the electric lights of the ironworks, though the insect is confined to the moors. Facts such as these indicate movements on the part of moths, for purposes that must be wholly conjectural in our present state of knowledge regarding the migrations of Lepidoptera.

As we shall presently find, numerous animals are peculiar to the moors, but apart from limited or unlimited vertical range, there are indications of a limited longitudinal range of species. I say indications advisedly, for the distribution of many forms is still very imperfectly known, and any conclusions are likely to be rendered nugatory by the discovery of fresh localities. Thus, *Aspilates strigillaria*, a heath-frequenting moth, has not yet been found by local entomologists further westwards than Danby; a fact not explicable on the assumption of the westerly ground being inadequately worked, since the insect fauna of that area is much better known than that of the eastern area. The species, however, occurs further eastwards at Cloughton Newlands. The Solitary Ant (*Mutilla europæa*) seems to be confined to the moors of the seaboard between Robin Hood's Bay and Scarborough.

The richness of the land fauna of Cleveland is due to the variety of natural habitats the district affords. Coast sand-dunes, salt marshes, rocky cliffs, wide moors of different types, woods, lanes, fields, hills and valleys, all have different resident faunas adapted to the varied conditions of life in each. We may term these faunal groups, "associations," analagous to the plant associations of the botanist, and it will be of no little interest to contrast the faunal associations of the local sand-dunes, pine woods, and moors with one another.

In the case of the Coatham sand-dunes, the first point which strikes the observer is the great abundance of Mollusca, nearly a dozen species of land snails being more or less numerous. In this respect the dunes are in marked contrast to the moors which possess no molluscan fauna except the Black Slug (*Arion ater*). For this contrast there must be some cause, either in the nature of the vegetation, or the differences of climate and soil. No doubt the moors are unfavourable to molluscan life, but it remains to be shown how the various botanic, climatic, and edaphic conditions act injuriously upon these organisms. In the pine woods, slugs are fairly numerous but other Molluscs do not seem to be at all common.

Numerous species of insects are peculiar to each habitat, and this arises from the fact that they are confined to the special plants growing in these localities. On the sand hills several special Lepidoptera are to be met with, *Tapinostola clymi*, and *Agrotis velligera* among others, as well as peculiar Coleoptera. In pine woods the restricted insect fauna is much more numerous, and to confine our attention to those living on the Scots Pine there are nearly a dozen species of Lepidoptera (such as *Trachea piniperda*, *Ellopija prosapiaria*, etc.); numerous Beetles (such as the Pine Weevil, *Hylobius abietis*); and Sawflies (such as *Sirex juvencus* and *gigas*, *Lophyrus pini*) together with their parasites. *Rhyssa persuasoria* is the most extraordinary of these parasites on account of its laying its eggs in the burrows of the Giant Sawfly, (*S. gigas*), on the larvæ of which it feeds. These insects form a most heterogeneous association, all united by the fact of their being ultimately dependent upon the pine tree for their existence.



Rhyssa persuasoria, AN INSECT PARASITIC ON LARVÆ LIVING
IN THE WOOD OF PINE TREES. ESTON HILLS.



SOLITARY ANT (*Mutilla Europæa*), FEMALE, ENLARGED.
SECOND YORKSHIRE EXAMPLE; FROM MOORS NEAR ROBIN HOOD'S BAY



The faunal association of the moors is also peculiar, including among birds, the Grouse, the Merlin, the Ring Ouzel and the Twite; among beetles numerous forms such as *Haltica ericeti*, and the weevil (*Ceuthorhynchus cricæ*); sawflies, hemipterons, and spiders, as well as the Viper amongst Reptiles. The heath-frequenting Lepidoptera, besides being restricted to special moorland plants, are also restricted to habitats but little altered by man. For centuries the moors have remained as they are now, and moreover unlike birds or mammals, the insects have never been disturbed. We feel, therefore, that any conclusions we may deduce from their distribution, which is better known than that of any other order of insects, will be found to be of permanent value.

The subject of faunal associations has had to be treated somewhat cursorily, not only owing to lack of space but also from the circumstance that very much more zoological work yet remains to be done in Cleveland, before exact and accurate comparisons can be made. Interesting results would be bound to appear, and would throw light, on the local distribution of various animals and their past history.

It may be remarked that the nature of our woods, when the natural origin of these is disputed, may be inferred from the insect fauna. Recently planted woods of coniferous and deciduous trees in different parts of the district never contain the Wood Ant (*Formica rufa*). This insect, so far as my observations go, is confined to localities on the edge or slope of moorland valleys, and the ant hills may often be seen on the open moor far enough away from any wood. The Wood Ant is not a moorland insect, and in one place, Great Hograh Beck in Basedale, its nests are extremely numerous along the sides of that wooded ravine. All the evidence goes to show that this wood is natural, and that wherever the nests of the Wood Ant occur, even if no trees be now near (as in the lower heathery parts of Basedale), they indicate the presence of former woodland.

In concluding this section, it is evident that in the same manner as the botanist speaks of ecological botany, so the zoologist can speak of ecological zoology. That is, the ascertainment of the species of animals of any particular habitat,

a pine wood, a moor, a salt-marsh, or a sand dune ; the conditions under which they live ; the features they have in common ; the features in which they differ ; their relationship to one another ; and their distribution over any district. If plants are dependent on soil, climate, altitude, and other factors, animals are also not only dependent on these, but on the plants as well, factors which differ everywhere, not only in different associations but in the same associations occupying different localities. By thus noting in what these faunal groups agree, and in what they disagree, some substantial basis will be found for an adequate discussion of the history of animals which in its turn is largely dependent on the geological changes any area has undergone. To this history we must now turn.

V.—THE HISTORY OF THE TERRESTRIAL FAUNA.

The dynamical aspect of the fauna deals with its evolution, and the history of the succession of faunas which have lived within the district. It is a branch of zoology beset with peculiar difficulties. The lack of data so apparent when considering the statics of the fauna could easily be obtained by further investigation. Not so with the dynamics of the fauna, the full history of which can never be written because the records have absolutely disappeared. Hence, an interpretation of the land fauna must to a large extent be speculative, for in this enquiry palæontology helps us but little. From it we learn, however, that the mammalia were once extremely different from what they now are. The remains found in the celebrated cave of Kirkdale proved that a most extraordinary assemblage of mammals formerly lived in North East Yorkshire. It seems probable that the occupants of this hyæna den flourished in pre-glacial times, for the mammalia found in the post-glacial peat bogs only include, at any rate in Cleveland, the Red Deer, the Reindeer, the Wild Boar, the Wild Ox, but not such animals as the Hyæna, Mammoth, Rhinoceros, or Hippopotamus.

Arguing from analogy, it seems reasonable to infer that the insects of the pre-glacial period must have presented similar features to the mammalia, that is, a strong mixture of African and northern species, but of this we have no palæontological evidence. Nor does there seem to be any

trac · left in the present insect fauna of the extreme southern species of pre-glacial times. In this respect they agree with the post-glacial mammalia, and it may be inferred from this that the Ice Age must have been the factor in exterminating the southern fauna.

The relation of the Cleveland land fauna to the Ice Age is one of extreme importance, and it is in this relation where I think the special interest of our fauna lies to the student of zoo-geography. For as Professor Kendall well remarks—“The whole argument concerning the history of our fauna depends upon a correct and sound conclusion regarding the facts of glacial geology.” Accepting, therefore, the conclusions of the glacialist as thoroughly established, we may remark that the pre-glacial animals would be driven from those parts of our district covered with deposits left by the ancient ice. But a large part of Cleveland was never over-ridden by glaciers, and the driftless area corresponds roughly to the moorlands and the great dales south of the main Cleveland watershed. If now we turn to Greenland, which contains a comparatively numerous fauna and flora living close to a heavily glaciated land surface, it seems natural to infer that during the Ice Age the driftless area of Cleveland supported a somewhat similar Arctic fauna and flora.

Merely noticing in passing that most of the moorland plants flourish at the present day in Arctic climates, we shall find that several species of insects now living in Cleveland also live under the glacial conditions of Greenland, and probably with various Arctic plants have existed on the driftless region throughout the Ice Age. Of these insects, I have so far been able to discover eight, four beetles and four moths as follows:—

MOTHS

Agrotis occulta v. *implicata*. In Scotland and in Greenland. Absent from Shetland. (Spüler.)

Plusia interrogationis. In Greenland (Rink.)

Cheimatobia brumata. In Greenland. (Rink.)

Eupithecia nanata v. *gelidata*. A dark form from the Shetlands, Greenland, and Labrador (Spüler.)

BEETLES.

Quedius fuligidus. As far north as Discovery Bay, and extends over Greenland and the whole of North America and Europe as far south as the Atlantic Islands (Fowler).

Creophilus maxillosus. Common throughout the kingdom. Greenland (Fowler).

Otiorrhynchus maurus. Local. Greenland and Iceland (Fowler).

Bradycellus cognatus. Local; on heaths and mountains in high districts but occasionally found in lowlands. Greenland (Fowler).

The present enquiry reveals very clearly the extraordinary adaptability of certain species of insects, the same kind often ranging from a warm to an Arctic climate. As I have elsewhere pointed out the approach of the Ice Age would be gradual, and joining this fact with the great adaptability of insects we may infer that numerous other species survived the Ice Age on the driftless area of Cleveland.

The course of events, therefore, in the Quaternary history of our fauna seems to have been a pre-glacial fauna similar to the present but containing more species; then, the Ice Age with extinction of most forms except those that survived on the driftless area; and finally, a re-advance of the temperate and southern forms with commingling of northern species after the retreat of the ice. Hence the fauna of Cleveland must consist of diverse elements, viz. :—

- 1.—Pre-glacial survivals.
- 2.—Northern forms, coming with the Ice Age.
- 3.—Temperate and southern forms, coming into the district after the Ice Age.

Generally speaking, the land fauna of Cleveland belongs to that typical of England—the “Continental or Germanic” type—with a faint mixture of Arctic forms on the hills: and a still fainter Gallic facies represented by *Mutilla europæa*.

Palæontology being of little assistance in solving the history of the local fauna, we have to fall back on temporary explanations indicative of the various parts of the world whence our local animals have come. For all species except residents this is comparatively easy, since we can readily trace them back to their homes. Various insects and shells are introduced by man from the different countries of the Continent, and the singular point about some of these introduced species, is the fact of their very rarely, if ever, becoming residents in the district. Thus, the Timberman Beetle (*Astynomus ædilis*) occurs commonly at Middlesbrough in imported timber and has even been taken in the neighbourhood. Yet despite the very favourable plantations of fir and pine this insect has not become established.

Colonies of the Kentish Snail (*Helix cantiana*) introduced in railway ballast flourish for some time and then die out.

Turning next to the migratory and visiting birds of Cleveland, these animals coming to us from distant countries only need a change in their life conditions here, to make them permanent residents. Doubtless in the past, changes have taken place and converted a visiting species into a resident species.

It is generally accepted by naturalists, that all species of animals have arisen by descent with modification from proximate or remoter ancestors. The species of a genus, however, are not uniformly distributed. In some localities they are more numerous than in others, and if the species have been derived from some common ancestor, it is clear that where they are most thickly clustered the evolution of forms will there have been most active. Gradually the various individuals advancing further and further from a centre of distribution give rise to less numerous forms, and by tracing back our native species to their original centres we can readily comprehend how they have dispersed from different countries.

The gradual approach of the Ice Age brought with it a great number of Arctic animals and plants, some still surviving in parts of our district. We may take as an example the

genus *Lagopus*, to which the Grouse belongs, and which includes the Ptarmigan, the Willow Grouse, and other species. The Grouse is a species considered to be peculiar to Britain, though closely related to the Scandinavian Willow Grouse. Belonging to a genus of strictly northern and even Arctic range, it follows from the theory of centres of distribution that it came from the north. Its history seems to have been the dispersal southwards by the Ice Age of a bird extremely like, if not identical with the Willow Grouse, its gradual adaptation to the post-glacial climate of Great Britain, and consequent loss of white plumage in winter owing to the less abundant snowfall. In other words the Red Grouse is simply a southern form of the Willow Grouse, evolved during the complex movements of animals during the glacial and post-glacial periods.

Several other northern animals came with the Grouse, including the Little Yellow Underwing Moth (*Anarta myrtilli*), and various beetles. But the competition of southern forms has driven most of the true arctics from Cleveland, and it is now chiefly on the higher mountains of our island that they are to be found.

If the Ice Age drove out most of the pre-glacial species, it would seem likely that these northern animals constitute the oldest elements of our fauna, but indications are not wanting that some forms may have survived from Pliocene times.

The beautiful Emperor Moth so abundant on our moors, belongs to the genus *Saturnia*, which has its head-quarters in Asia. Hence, on the theory, Asia is to be regarded as the home of the Emperor Moths which have gradually spread westwards across the Old World. The present distribution of the Emperor Moth supports this contention, as it occurs all over Europe, except in the Islands of Sardinia and Corsica, and extends far into Palæartic Asia.

Various other animals inhabiting the district can similarly be traced back to centres of origin. An American element is to be found in the Pearl Mussel (*Unio margaritifera*); an Asiatic element in the Nightjar and the Death's Head

Moth; a South-Eastern European element represented by the Tiger Beetle, and the *Clausilia* amongst the Mollusca; and a central European element in the beautiful Thorn Moths.*

Although this theory undoubtedly accounts for the distribution of many species of animals, it by no means accounts for all. Species may have arisen in centres that are now lost, because the species there have died out; and where a genus is now most highly developed, this has not always been the case, as palæontology shows. For instance, in the first section of this paper we saw that the genus *Astarte*, though now so abundant in northern seas, was in Jurassic ages most numerous in the warm seas of Central Europe.

Where fossil evidence is lacking, as in the majority of insects, speculations as to their original homes must at the best be hazardous. One of the beetles mentioned as living in Greenland belongs to the genus *Creophilus*, which attains its maximum development in New Zealand where there are six species, a seventh occurs in South America, and the eighth, *C. maxillosus*, is the European form. According to the theory of centres of distribution New Zealand should be regarded as the place of origin of these insects, but it is quite clear that the species of this group originated at a time when the present distribution of land and water was quite different, and that the home of the genus may have been in lands now beneath the sea. That the species of a genus originated in a centre cannot be disputed, but it would be erroneous to suppose the present distribution of the species indicates this centre.

VI.—CONCLUSION.

Having reached the end of our survey of the zoology of Cleveland, past and present, it only remains to sum up the chief conclusions we have drawn from it, and to take a comprehensive view of the evolution of the fauna as a whole. We saw that the earliest fauna of the district is a marine one, and dates back to the late Triassic Period. This fauna was in its turn succeeded by the numerous faunas of the Lias and

*For further details see Scharff's "*European Animals, their Geological History, etc.*," and "*History of European Fauna.*"

Inferior Oolite, all distinct from one another, all now totally extinct, all very different from the present inhabitants of the local coast line, and indicative of a warmer climate. Not in this district, but in Eastern Yorkshire, we can further trace the evolution of marine animals to the close of the Cretaceous Period. Age after age, fauna succeeded fauna, until just before the Glacial Period, the North Sea contained a suite of animals very similar to those now living there. With the advent of the Ice Age the pre-glacial animals were slowly driven from the sea, and replaced by Arctic species, until even these were driven out by the advent of the great northern ice-sheet.

After a longer or shorter period of refrigeration, the climate gradually began to ameliorate, the ice-sheets retreated northwards, and were followed by the marine species characteristic of the Arctic province; these in their turn were succeeded by the temperate species with a few southern forms, until the present status of the marine fauna was reached. This succession of events was probably interrupted by the conversion of the sea-floor into land, and minor fluctuations of climate.

The land-fauna can only be traced back to late Tertiary times. What it may have been before then we have no local evidence to show, but from data found in other parts of Britain, it may in the future be possible to fill in the Tertiary history of our animals. In Pliocene times the mammalia were of African, northern, and temperate types, features probably characteristic of all the other land animals of the district. The approach of the Ice Age brought with it numerous Arctic species, many of which survived that period on the driftless area. In post-glacial times, the temperate and southern animals belonging to our fauna once more entered the district, unaccompanied, however, by any African or extreme southern species. These gradually ousted the true Arctic species, occupied all those habitats for which they are adapted, and in so doing formed faunal associations very distinct from one another. We also saw that many of our residents originated in various parts of the world, the Arctic regions, Europe, Asia, and America, long before the Ice Age, the Glacial Period being merely an incident in their complex evolution.

Finally, it may be observed that since the whole of Britain was severely glaciated, the return of the land-fauna must have taken place from the Continent, across lands now covered by the North Sea and the English Channel. Doubtless the fluctuations of climate in post-glacial times affected the terrestrial animals to a greater or less degree, but a consideration of these changes must be left for a future occasion.

Of course, in a short paper like this, only a very imperfect outline can be given of such an extensive subject. Many interesting aspects of the fauna have had to be omitted, and others just briefly touched upon. We have, however, been enabled to perceive clearly the largeness and variety of the fauna of Cleveland, and the interesting problems it presents. Above all we have learned that it is far from being fixed, and that like all other existences it conforms to the great law of evolution.

JURASSIC PLANTS FROM THE CLEVELAND HILLS.

BY REV. GEORGE J. LANE, F.G.S.

Palæobotanical records afford striking evidence on the study of plant evolution.

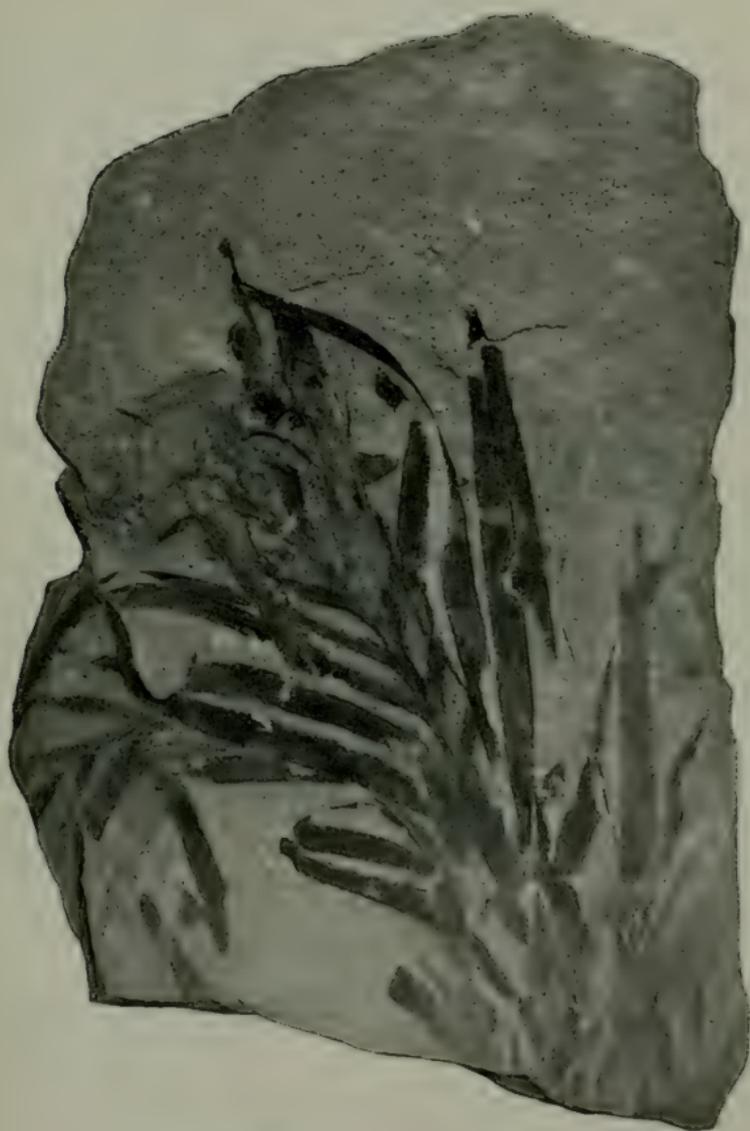
The Permo-carboniferous vegetation reveals a comparatively homogeneous flora of wide geographical distribution, consisting largely of Lycopods, Calamites and Vascular Cryptogams.

That the "Cycads," the abundance of which is one of the most conspicuous features of the "Mesozoic Flora," existed in Palæozoic Ages, there is no conclusive proof. Only limited evidence can be supplied of the occurrence of genera which can be confidently placed in any of the existing families of the Conifers.

At the close of the Wealden period a second evolutionary wave occurred in the world's vegetation, as shown by the decrease of the Cycads and the emergence of Angiosperms.

The testimony of the Yorkshire rocks contributes much to our knowledge of the vegetation of the Lower Oolitic period. Since the days of Young, Bird, and Phillips, Yorkshire has been classical ground for Bajocian plants.

The comparative absence of records from the Cleveland Hills is, however, a regrettable fact. Our area if persistently worked will, I am fully persuaded from my own personal experience, yield valuable contributions to our knowledge of Bajocian vegetation. To the late Rev. J. Hawell we are deeply indebted for his researches in this particular, but much remains to be done. Our knowledge at present is very circumscribed. Coming into this district in 1904 and re-



Zamites sp. (cf. *Buchianus*).
INFERIOR OOLITE SANDSTONE, CARLTON BANK.

PHOTO.]

[F. ELGEE

cognising this department of study as attractive and offering scope for investigation I essayed the task. After laborious journeys, meeting with non-success, I was rewarded with some valuable finds in 1906. Some of these were entirely new records for our district and were given by me to the Middlesbrough Museum. Among the fossil plants were :—

- 1.—*Equisetites columnaris*. It consisted of the crushed part of a stem, near the apex where the leaf sheaths are close.
- 2.—*Otozamites graphicus*.
- 3.—*Baiera Lindleyana*.
- 4.—*Zamites species*. This is a remarkably fine specimen deposited in light brown sandstone (see illustration).

With the valuable aid of Mr. Elgee, Assistant Curator of the Dorman Memorial Museum, we determined three of these plants correctly, but the plants were subsequently forwarded to Mr. Seward, who confirmed our determinations.

Zamites species has not been recorded previously from the Bajocian in Yorkshire. It bears a striking resemblance to a species named *Z. Buchianus* discovered among the Wealden Flora, and suggests that the character of the vegetation of the world from the Upper Triassic period to the Wealden to have been remarkably uniform and constant in its main features.

Otozamites graphicus, and *Baiera Lindleyana* are new records for the North-West Cleveland area.

The geological horizon from which these plants were derived is the Inferior Oolite of Estuarine origin. This sandstone bed in the neighbourhood of Carlton Bank is full of plant remains, and some short time ago a fossilised tree a few yards in length was seen and awakened much interest. This sandstone attains a greater thickness in this locality and contains less shale than further east and was probably deposited in the estuary of a river flowing from west to east in early Oolitic times.

A LARGE GLACIAL BOULDER AT WHORLTON.

BY THE REV. J. C. FOWLER, B.A., F.G.S.

I have recently had a photograph taken of an immense boulder which lies in the beck about three-quarters of a mile from the village of Swainby, up Scugdale. The block accompanying this paper is from the photograph, which shows the erratic in situ. It is of Shap Granite, sub-angular like the majority of erratics showing what rough usage it has had—long continued—so as to wear down all the angles even of such hard stone. It lies in the moraine of the great glacier which pressed up Scugdale and overcame the local one coming down the valley, as these valleys probably all contained local glaciers, and here it has been at rest for some 50,000 years; which appears to be a fair estimate of the time since the Glacial Period according to our present knowledge, the tendency of the present time, however, being to lower that estimate somewhat.

The boulder is very large, the dimensions being as follows: Round the stone at the water level it is 23 feet. From the water level at the left (looking at the photograph) over the back down to the water level on the right 17ft. 2in. In the foreground, from the water level over the highest point to the water on the other side 10ft. We do not know the shape under ground or how far it rests out of sight.

The distance from Shap on the Pennine Chain in Westmoreland in a straight line is sixty miles or more and this boulder must have been brought with countless others down the direction of the Tees Valley. There are boulders of Shap Granite and Basalt (chiefly) scattered over the North

and East Ridings of Yorkshire in particular. One very large boulder may be seen in a street in Darlington; another one as big at Seamer Junction near Scarborough in the station master's garden (both Shap Granite). I have noticed two rather large boulders of Basalt at Barnby, near Market Weighton, and on the Yorkshire Coast they may always be found of all sizes up to large blocks; there is a fine erratic preserved in the churchyard at Grosmont, brought from High Burroughs farm in 1892—345ft. above sea level.—it is of Shap Granite and probably contains about one cubic yard.

We have many other erratics in this parish but of the glacial boulders I have seen, the one here illustrated is amongst the largest and of great interest. I have a large collection of drift stones which I have picked up from time to time, and about which I may have something to say in the future.

AN INTERESTING GEOLOGICAL DISCOVERY.

BY THE REV. J. C. FOWLER, B.A., F.G.S.

An addition has recently been made to the old churchyard at Whorlton of half an acre, on a slope, at the west side facing the village of Swainby. In the process of digging the drains, eight of which were made, draining into a main drain at the bottom, a uniform depth of 6ft. of drift clay was found full of boulders, except at the N.E. corner where the shale was met with in a confused mass nearer to the surface.

In the third cutting from the road near the top, the drainers found a tree stump at the depth of 6ft. from the surface, the stump was about 2ft. high and the roots were in the shale below; the drainers broke off the stump and left the roots in the shale and the stump is now in my possession.

The tree was evidently about 15 or 16 inches diameter at the bottom, and the stump is in a rotten condition, some of the wood is still hard and black and appears to be oak, but of this I can say nothing positive: the interesting thing about it is that it was found as it grew, overwhelmed by glacial drift 6ft. deep. These shales are Lower Lias.

Before the glacial period the physical geography of this country was in the main as we see it now, the chief features not being greatly altered. It is quite certain, however, that the outline of the Cleveland Hills extended much further north than at present, a large part being worn away by glacial action, especially that of the melting ice streams. It would appear that this tree grew at the close of the glacial

period when vast quantities of Lias had been removed and this particular spot worn down to the Lower Lias shales. The drift full of boulders of all sizes up to stones as much as one can lift was deposited under torrential conditions, and the tree was evidently overwhelmed.

Most of the stones are of local rocks, but specimens of limestones, including Dent Marble (so-called), Shap Granite, Basalts, and other travellers, are common; in one place quite a number of Dogger boulders occurred.

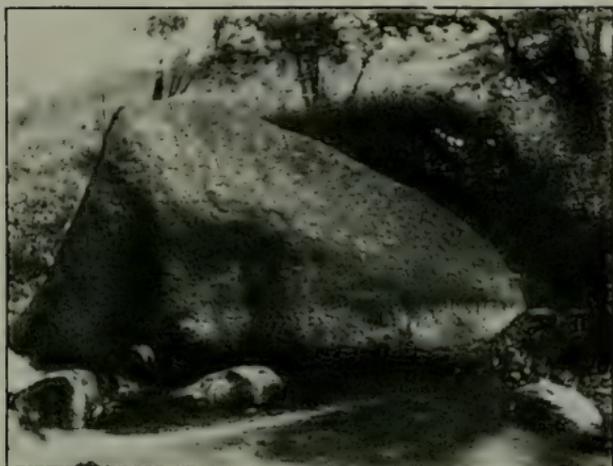
This is the first time that I have met with any announcement of a tree having been actually found as it grew in one of the mild inter-glacial seasons, if there were any; or at the end of the Ice Age before the mantle of drift was distributed by torrential waters.

A COUNTER, TEMP. EDWARD III.

BY THE REV. J. C. FOWLER, B.A., F.G.S.

The coin of which we give illustrations was found some years ago in the inner moat of Whorlton Castle, it was dug up and came into my possession at the time. I have now had a couple of blocks made so as to reproduce it for our Proceedings. It is in very fine preservation—not a current coin of the realm, but a Counter used by the King's Chamberlains for counting the expenses of his privy purse. I showed it to the officials of the coin department at the British Museum; the late Sir John Evans happened to be present, and he was most interested in the coin, which he greatly admired; it was made after the coins of France of the period. As a matter of course, a duplicate coin was produced, but it was as thick as a florin, and my coin is quite thin like Elizabethan coins. On the "Obverse" the coin has a shield in the centre charged with three keys—indicating the chamberlain's office, on a bend surrounded with crowns and lions; and round the whole EDWARDUS REX REGNAT, crowns also being interspersed between the words. On the "Reverse" there is an arrangement of "Fleurs-de-lys" at the four extremities of a cross with equal arms in a kind of square with four more "Fleurs-de-lys" in the angles, and round the whole the words GARDE ROBE REGIS, the words being separated by crowns as on the "Obverse." "Garde-robe" meaning wardrobe or private apartments of the king.

Coins are still used as counters by old fashioned people at whist, and Shakespeare's "As you like it," ii. 7., says "what for a *counter*, would I do but good?"



LARGE BOULDER OF SHAP GRANITE, SWAINBY

COUNTER, TEMP EDWARD III



OBVERSE.



REVERSE



Tally-sticks may still be seen hanging from the sides of huxters' carts in Brittany.

It would be interesting if we could find out how this particular counter came to be at Whorlton Castle. There is no evidence to show that Edward III was ever here. Graves informs us that Nicholas de Meinill "was summoned to Parliament among the Barons, from the 9th to the 16th Edward III," so that Whorlton was not unknown to the King by name and representation. Then again in those days monarchs travelled about a good deal over their domains and frequented the castles of their Barons and sometimes paid royal visits to monasteries, and many a time an Abbott or a Prior has been delighted to see the back of some royal or dignified person who has honoured him with a visit, and depleted his larder to the no small hurt of the monastery.

However, the coin has survived so far, as a link with the past, and may have fallen out of the doublet of one of the royal retainers who might have been sent to the castle on some royal errand. This coin carries us much further back than the date of the gatehouse of the present castle, viz., Richard III. An interesting article on the expenditure of Edward III may be found in the first volume of "The Antiquary," by Sir James H. Ramsay, Bart.

Since writing the above, during a search in the Public Record Office, I discovered in "The Patent Rolls" and "Calendar of Close Rolls," that Edward II or his Chancellor with his seal was at Whorlton on August 6th and September 4th, 1323, where several letters were dated. Letters were also dated from Darlington, Northallerton, Thirsk and Stokesley; but I did not find any mention of a visit from Edward III.

CLEVELAND LEPIDOPTERA IN 1903.

 BY T. ASHTON LOFTHOUSE, F.E.S.

*Denotes species recorded in Proceedings for first time.

The weather in the spring and early summer was cold and inclement as has been usual in the district for the past few years. "Sallows" in the spring were early and soon over and nothing of any note was taken off. The summer was somewhat finer on the whole but insects were mostly late; towards the end of August and in early September a few days of fine hot summer weather occurred and insects were specially noticeable at this time, the heather bloom which was very late was more than usually attractive while at the same period "Sugaring" absolutely failed. Many interesting species occurred on the heather bloom, among them being *Noctua dahlia* and *Triphosa dubitata* insects both new to the local list, other insects that occurred were *Orthosia suspecta* (a belated worn specimen, only the second recorded for Cleveland); *Cloantha solidaginis* in numbers; *Noctua glareosa*, very plentiful and very variable, some specially fine rosy specimens being noticeable; *Polia chi*, *Thera firmata*, *Cidaria populata*, *immanata* and *testata*, *Larentia caesiata*, and many other common species. "Sugaring" as an attraction proved of very little use this year with one or two exceptions, one warm evening in September it attracted seven specimens of *Epunda lutulenta*, one *Anchocelis lunosa* and other common species.

NOCTUÆ, Cymatophora flavicornis. A notable feature of the season was the finding of this insect in abundance and very variable in March among Birch on Eston Hills by Mr. J. W. Harrison.

Acronyeta leporina. Larvæ taken off Alder at Castleton.

Acronyeta menyanthidis. Taken at Danby on June 4th.

Celæna haworthii. A specimen of this insect taken at sugar in garden at Linthorpe on September 3rd, a rather unusual locality for this species.

**Noctua depuncta*. Taken at sugar at Kildale in August.

**Noctua dahlii*. Taken at Heather bloom and sugar at Kildale.

Triphæna fimbria. Imagines taken at Thornaby by Mr. Proud. Larvæ also taken near Middlesbrough by Mr. Harrison.

Orthosia suspecta. Single worn specimen at Heather bloom at end of August.

Dianthæcia cucubali. Took number of Larvæ off *Silene* seeds in garden at Linthorpe also off *Silene flos-cuculi* seeds at Kildale.

GEOMETRAE. *Epione apiciaria*. Fairly plentiful about Sallow bushes at Kildale in August.

Eugonia alniaria. Noticed at Kildale in September.

Oporabia filigrammaria. Kildale.

**Thera firmata*. Common on Heather bloom at Kildale.

**Triphosa dubitata*. Taken at Heather bloom Kildale.

PYRALIDES. **Scoparia cratægella*. At sugar Kildale.

PHYCIDÆ. **Homæosoma nimbella*. Middlesbrough.

TORTRICES. **Tortrix unifasciana*. Redcar.

Tortrix costana. Bred from Mandale Bottoms.

**Peronea caledoniana*. Battersby and Kildale Moors.

**Argyrotoza conwayana*. Beaten out of Wild Rose at Great Ayton in June.

**Ptycholoma lecheana*. Guisborough.

**Hedya lariciana*. Kildale, only two previous Yorkshire records for this species.

Hedya neglectana. Middlesbrough.

**Sciaphila subjectana*. Bred from wild parsley, Mandale Bottoms, and taken at Redcar.

**Sciaphila hybridana*. Redcar.

**Phoxopteryx myrtillana*. Eston and Great Ayton on Heath.

**Pædisca corticana*. Taken from Firs, Guisborough.

**Pædisca sordidana*. Among Alders. Great Ayton.

**Ephippiphora pflugiana*. Kildale.

**Pamplusia mercuriana*. Battersby.

**Retinia pinivorana*. Kildale.

**Stigmonota internana*. Fairly common about Gorse at Eston, also occurs at Ayton and Kildale.

**Stigmonota regiana*. Bred from Larvæ taken under bark on Sycamore trees at Ayton and Guisborough.

**Catoptria cana*. Kildale.

**Trycheris aurana*. Kildale.

**Eupæcilia atricapitana*. Redcar.

**Xanthosetia zoegana*. Redcar and Marske.

TINEÆ. *Lemnatophila phryganella*. Off Oak, Kildale.

**Epigraphia steinkellneriana*. Saltburn.

**Scardia cloacella*. Middlesbrough and Kildale.

**Tinea semifulvella*. Great Ayton and Tollesby.

**Incurvaria muscalella*. Flying plentiful in sun along hedges at Linthorpe in May. Kildale in June.

**Harpiteryx xylostella*. Bred from Honeysuckle, Middlesbrough and Guisborough.

- **Depressaria costosa*. Marske and Kildale.
- **Depressaria alstræmeriana*. Saltburn.
- **Depressaria angelicella*. Kildale.
- **Gelechia ericetella*. On heath Kildale and Swainby.
- **Gelechia dodecella*. Kildale.
- **Anacampsis ligulella*. Kildale.
- **Ceratophora rufescens*. Redcar.
- **Argyresthia spiniella*. Among Mountain Ash at Great Ayton and Guisbrough.
- **Ornix anglicella*. Swainby.
- **Coleophora fabriciella*. Great Ayton, only one previous record in the Yorkshire list.
- **Coleophora albicosta*. Among Gorse at Eston in June, also at Kildale and Stokesley.
- **Coleophora laripennella*. Redcar.
- **Elachista rufocinerea*. Saltburn.

1907.

For the most part of the spring and summer of this year the weather was cold, showery and sunless, June was exceptionally wet, there being over 3in. rainfall registered at Middlesbrough. The result of this was that insects were scarce and what occurred were mostly exceptionally late; as evidence of the lateness of the season the dates on which the following species were noticed will give some idea: *Melanthia bicolorata*, three specimens on October 5th; *Xylophasia monoglypha* at sugar on October 22nd and 25th; and two specimens of *Cosmia trapesina* on October 12th.

“Sallow” bloom in early April attracted a large number of the commoner *Tæniocampidæ* and also a few *Trachea piniperda*, and one or two specimens of *Triphosa dubitata*. “Sugaring” proved a complete failure.

NOCTUÆ. *Mamestra abjecta*. One on sugar at Redcar in July, also several *M. albicolon*.

Celæna haworthii. A few dashing about on moor at Danby (very worn) on September 28th.

**Cucullia verbasci*. Larvæ on Mullein in garden at Linthorpe.

GEOMETRÆ. *Selenia lunaria*. Two or three specimens at Great Ayton in May.

**Boarmia gemmaria*. Common in gardens all over district, comes freely to light. Some of the specimens quite dark.

Hybernia leucophearia var. *marmorea*. Took very nice specimens of this variety at Guisbrough in March.

**Eupithecia innotata*. Specimen taken on banks at Redcar at end of June.

PYRALIDES. **Ebulea sambucalis*. At Valerian flower in garden, also common at light.

PTEROPHORIDÆ. *Amblyptilia acanthodactyla*. Danby at end of September.

TORTRICES. **Penthina dimidiana*. Redcar.

**Spilonota trimaculana*. Bred Middlesbrough district.

**Capua favillaceana*. Among bracken near Great Ayton.

**Stigmonota orobana*. Staithes.

**Dichrorampha plumbagana*. Redcar and Staithes.

**Pyrodes rheediella*. Kildale.

**Eupœcilia angustana*. Staithes, Kildale and Glaisdale.

TINEA. **Tinea fuscipunctella*. Linthorpe, Middlesbrough

**Lampronia rubiella*. Eston.

**Nemophora swammerdammella*. Great Ayton.

**Adela rufimitrella*. Swept off grass plentiful near Ayton.

**Adela viridella*. Kildale.

- **Swammerdamia cæsiella* and var *griseocapitella*.
Kildale.
- **Plutella porrectella*. On Valerian flower at Linthorpe.
- **Bryotropha politella*. Staithes.
- **Nannodia stipella* var *næviferella*. Redcar.
- **Parasia metzneriella*. Sandsend.
- **Chelaria hubnerella*. Kildale.
- **Gracilaria alchimiella*. Great Ayton.
- **Gracilaria tringipennella*. Kildale.
- **Gracilaria syringella*. Common about privet in garden
in June.
- **Coleophora aleyonipennella*. Bred Saltburn.
- **Coleophora laricella*. Common among Larch at Great
Ayton.
- **Coleophora fuscedinella*. Bred from Birch and Alder,
Ayton and Middlesbrough.
- **Chauliodus chærophyllellus*. Great Ayton.
- **Chrysoclysta aurifrintella*. Redcar.
- **Elachista cinereopunctella*. Kildale.
- **Tischeria complanella*. Great Ayton.
- **Lithocolletis faginella*. Kildale.
- **Lithocolletis corylifoliella*. Redcar.
- **Cemiostoma laburnella*. Common at Eston and
Middlesbrough.

REPORT ON THE COLEOPTERA OBSERVED IN
CLEVELAND.

BY M. LAWSON THOMPSON, F.E.S.

The following report on Beetles occurring in the Cleveland District consists chiefly of records made in the early part of last century by the late Rev. G. T. Rudd, M.A., and L. Rudd. Many of them may be found published in Stephens' "Manual of British Coleoptera (1839)." G. T. Rudd was Vicar of Sockburn and resided for a number of years at Worsall Hall, near Yarm. He died in London on March 4th, 1847, at the age of 52. He appears to have been a regular correspondent of Stephens, as may be seen by a reference both to the "Manual" and the "Illustrations of British Entomology" (Coleoptera) (1828).

The remaining notes refer to my own earlier observations, and those of my friend, the Rev. W. C. Hey, M.A., of West Ayton, near Scarborough, who has visited Redcar and Coatham marshes in former years.

COLEOPTERA.

Cychrus rostratus, L. At Saltburn; and in Arncliffe Woods, Glaisdale.

Carabus nitens, L. On Eston Nab (G. T. Rudd).

Carabus arvensis, F. On Stanghow Moor near Saltburn (May, 1893).

Notiophilus aquaticus, L. On Easby Moor.

Notiophilus palustris, Duft. On Stanghow Moor.

Nebria livida, F. Redcar (G. T. Rudd).

Elaphrus cupreus, Duft. Marton (L. Rudd); Saltburn.

Miscodera arctica, Payk. On Stanghow Moor under a stone. One specimen in July, 1891.

Acupalpus meridianus, L. Banks of the Tees (L. Rudd).

Bradycellus placidus, Gyll. Banks of the Tees (L. Rudd).

Bradycellus distinctus, Dej. Saltburn, on the sea banks. One specimen in May, 1892.

Bradycellus harpalinus, Dej. On the sea banks at Saltburn.

Bradycellus collaris, Payk. On the moor at Kildale (August, 1903).

Dichirotrichus pubescens, Payk. Banks of the Tees. Common (G. T. Rudd).

Harpalus rubripes, Duft. Banks of the Tees (L. Rudd).

Pterostichus picimanus, Duft. Banks of the Tees (L. Rudd).

Amara aulica, Panz., *A. convexiuscula*, Marsh, and *A. tibialis*, Payk. Banks of the Tees (L. Rudd).

Calathus flavipes, Fourc. Banks of the Tees (L. Rudd).

Calathus micropterus, Duft. In a plantation below Stanghow Moor; also at Glaisdale.

Calathus piceus, Marsh. At Kildale.

Anchomenus fuliginosus, Panz. In Arncliffe Wood, Glaisdale. Common.

Bembidium minimum, F. At Eston (W. Hey).

Bembidium affine, Steph. Marton (G. T. Rudd).

Bembidium anglicanum, Sharp, (*Andreæ*, F.) and *B. paludosum*, Panz. Banks of the Tees (G. T. Rudd).

Trechus rubens, F. Saltburn, on the sea banks. One specimen in July, 1892.

Cymindis vaporariorum, L. Shores of the Tees. Six specimens in April, 1828 (L. Rudd).

Brychius elevatus, Panz. In the stream at Saltburn.

Haliplus obliquus, F. Marton (L. Rudd); Coatham Marshes (W. C. Hey).

Haliplus fulvus, F. Marton (L. Rudd).

Haliplus variegatus, Stm. Marton, rare (G. T. Rudd).

Haliplus rufficollis, De G. Redcar (W. C. Hey); Arncliffe Wood, Glaisdale.

Hyphydrus ovatus, L. Marton. Common, the males in the proportion of five to one (L. Rudd).

Cœlambus inæqualis, F. Maron, scarce (L. Rudd); Coatham Marshes.

Cœlambus impressopunctatus, Schal. (**picipes**, F.) Coatham Marshes. A single specimen March, 1887 (W. C. Hey).

Deronectus latus, Steph. Marton Lodge (L. Rudd).

Deronectus depressus, F. Marton, common (L. Rudd); Coatham Marshes (W. C. Hey).

Hydroporus piety, F. Coatham Marshes (W. C. Hey); Marton (L. Rudd).

Hydroporus lineatus, L. Marton Lodge (L. Rudd).

Hydroporus incognitus, Sharp., **H. memnonius**, Nic; and **H. nigrita**, F. Common in Arncliffe Wood, Glaisdale.

Agabus nebulosus, Forst. Marton, not common (L. Rudd).

Agabus melanarius, Aubé (**tarsatus**, Zett). In a pool in Arncliffe Wood, Glaisdale. One specimen in September, 1894. A very rare insect.

Agabus bipustulatus, L. Coatham Marshes (W. C. Hey); Arncliffe Wood, Glaisdale.

Copelatus agilis, F. Marton, 1828. in pools on the hills near Marton Lodge, but very scarce (L. Rudd).

Dytiscus punctulatus, F. Marton, 1829; not of very frequent occurrence (L. Rudd).

Acilius sulcatus, L. Coatham Marshes (W. C. Hey).

Gyrinus minutus, F. Marton (L. Rudd).

Gyrinus urinator, Ill. Marton (G. T. Rudd).

Helophorus aquaticus, L., and **H. brevipalpis**, Bedel. At Redcar (W. C. Hey).

Helophorus dorsalis, Marsh. Marton Lodge; uncommon (L. Rudd).

Cyclonotum orbiculare, F. On the margin of a pond at Saltburn.

Sphæridium bipustulatum, F. At Redcar (W. C. Hey).

Cereyon littoralis, Gyll., *C. unipunctatus*, L.; and *C. quisquilius*, L. At Redcar (W. C. Hey).

Cereyon hæmorrhous, Gyll. On the margin of a pond at Saltburn.

Cryptopleurum atomarium, Ol. Eston (W. Hey).

Aleochara fuscipes, F., *A. lanuginosa*, Grav., *A. nitida*, Grav., also var *bilineata*, Gyk., and *A. morion*, Grav. All these species are found at Redcar. (W. C. Hey)

Callicerus obscurus, Grav. Stockton-on-Tees (G. T. Rudd).

Homalota vestita, Grav. Eston (W. Hey).

Homalota pilicornis, Th. In Saltburn Wood, under the bark of a rotting fir stump. One specimen early in October, 1893.

Homalota trinotata, Kr. Common in vegetable refuse at Saltburn.

Homalota serdida, Er. At Redcar (W. C. Hey).

Tachyusa constricta, Er. Yarm (G. T. Rudd).

Autalia rivularis, Grav. Common in vegetable refuse at Saltburn.

Encephalus complicans, West. Marton Lodge (G. T. Rudd).

Oligota inflata, Man. Common in vegetable refuse at Saltburn.

Myllæna kiraatzi, Shp., and *M. brevicornis*, Mat. By the streams in Grinkle Wood (1907).

Tachyporus hypnorum, F. At Redcar (W. C. Hey).

Tachinus proximus, Kr. In decaying fungi in a plantation just below Stanghow Moor. Two specimens in September, 1905.

Tachinus elongatus, Gyll. Near Marton, very rare (L. Rudd).

Mycetoporus lepidus, Grav. On Stanghow Moor, near Saltburn.

Mycetoporus clavicornis, Steph., var., **forticornis**, Fauv. On the sand hills at Saltburn in September, 1907.

Quedius mesomelinus, Marsh, var., **fageti**, Th. In Saltburn Wood.

Quedius mesomelinus, Marsh, and **Q. tristis**, Grav. At Redcar (W. C. Hey).

Ocypus olens, Mull., and **O. brunnipes**, F. At Redcar (W. C. Hey).

Philonthus intermedius, Bois. In vegetable refuse at Saltburn. (July; 1907)

Philonthus æneus, Rossi, **P. politus**, F., **P. marginatus**, F., **P. sordidus**, Gr., **P. cruentatus**, Gmel., **P. varians**, Pk., and **P. trossulus**, Nord. All these specimens are found at Redcar (W. C. Hey).

Philonthus debilis, Grav. In a dead bird on the coast at Saltburn (1906).

Cafius fucicola, Curt. Redcar, in profusion (G. T. Rudd, vide Steph., Ill., 1833).

Cafius xantholoma, Grav. Common at Redcar (W. C. Hey). **Xantholinus punctulatus**, Pk. Redcar (W. C. Hey). Common at Saltburn.

Leptacinus batychrus, Gyll. Marton (G. T. Rudd).

Leptacinus linearis, Grav. In vegetable refuse at Saltburn.

Lathrobium brunnipes, F. Marton (G. T. Rudd).

Evæsthetus scaber, Grav. Marton (G. T. Rudd).

Stenus guttula, Mull. Marton (G. T. Rudd); Redcar (W. C. Hey).

Stenus bimaeculatus, Gyll. Marton (G. T. Rudd).

Stenus providus, Er., var., *rogeri*, Kr. On Hutton Moor near Guisbrough.

Stenus crassus, Steph. At Saltburn (1892).

Stenus argus, Grav. Saltburn, at the roots of grass on the sea banks (1893).

Stenus subæneus, Er. Saltburn, on the sea banks (1892).

Stenus ærosus, Er. In Arncliffe Wood, Glaisdale, on herbage (1894).

Bledius tricornis, Herbst. Redcar (G. T. Rudd, 1828, vide Ent. August, 1878).

Bledius bicornis, Germ. Banks of the Tees (G. T. Rudd).

Bledius arenarius, Payk. Common along the shores of Tees (G. T. Rudd).

Platystethus arenarius, Fourc. At Kildale.

Platystethus arenarius, Fourc., and *P. cornutus*, Gyll. At Redcar (G. T. Rudd and W. C. Hey).

Homalium riparium, Thems. In decaying fish in Saltburn Wood (1894).

Phlæocharis subtilissima, Man. At Yarm (G. T. Rudd).

Silpha nigrita, Cr. Marton Lodge (G. T. Rudd).

Choleva morio, F. Saltburn, in a dead bird (May, 1892).

Choleva nigrita, Er. At Saltburn.

Euconus denticornis, Mull. Marton Lodge (G. T. Rudd).

Eumierus tarsatus, Mull. In vegetable refuse at Saltburn (July, 1907).

Euplectus sanguineus, Den. In vegetable refuse at Saltburn (July, 1907).

Trichopteryx grandicollis, Man. In vegetable refuse at Saltburn (July, 1907).

Hippodamia Ib. punctata, L. At Saltburn. One specimen in February, 1893.

Saprinus æneus, F. Shores of the Tees (W. C. Hey); also at Redcar.

Epuræa prusilla, Ill. In Kilton Wood, near Saltburn.

Soronia punctatissima, Ill. In Saltburn Wood. One specimen in August, 1894.

Corticaria umbilicata, Beck. Saltburn, on the sea banks (July, 1893).

Corticaria elongata, Gyll. At Kildale.

Melanophthalma fuscula, Mum. At Kildale.

Silvanus surinamensis, L. Common in a granary at Thornaby-on-Tees.

Cryptophagus distinguendus, Stm. Saltburn Wood, in decaying fungi (September, 1902).

Atomaria ruficornis, Marsh; One specimen at Saltburn in 1897.

Ephistemus gyrinoides, Marsh. Common in vegetable refuse at Saltburn.

Typhæa fumata, L. At Kildale.

Aspidiphorus orbiculatus, Gyll. At Marton (G. T. Rudd).

Heterocerus lævigatus, Panz. Marton (G. T. Rudd).

Aphodius scybalarius, F., *A. sordidus*, F. and *A. tristis*, Panz. On the Redcar Sandhills (W. C. Hey).

Elater balteatus, L. At Eston, 1907 (G. B. Walsh).

Limonius cylindricus, Payk. Banks of the Tees near Yarm (G. T. Rudd).

Helodes minuta, L. At Kildale.

Cyphon pallidulus, Boh. Common on Stanghow Moor (July, 1907).

Toxotus meridianus, L. At Saltburn.

Donacia discolor, Panz. (comari, Suffr.). On Stanghow Moor in July, 1907.

Labidostomis tridentata, L. Roseberry Topping (G. T. Rudd, Steph., Man., p 307).

Lamprosoma concolor, Stm. In Saltburn Wood (June, 1907)).

Chrysomela marginata, L. Roseberry Topping (G. T. Rudd).

Phædon cochleariæ, F. On the margin of a pond at Saltburn.

Lochmæa suturalis, Th. Common on Stanghow Moor near Saltburn, also Castleton and Kildale Moors.

Galerucella tenella, L. Common in a bog at Kildale.

Longitarsus suturellus, Duft., var., *fuscicollis*, Steph. Taken at Saltburn and Kildale.

Longitarsus jacobæx, Wat., and *L. gracilis*, Kuts. Common on Ragwort at Kildale.

Haltica ericeti, Al. Common on Stanghow Moor; Kildale Moor.

Aphthona nonstriata, Gœze. Common at Seamer, near Stokesley (June, 1907).

Cassida nobilis, L. Marton Lodge, very rare (L. Rudd).

Cassida flaveola, Thumb. At Kildale in September, 1907.

Melandrya caraboides, L. Near Middlesbrough.

Salpingus æratus, Muls. On Stanghow Moor, and at Saltburn (July, 1907).

Notoxus monoceros, L. Redcar, in profusion (G. T. Rudd, 1828).

Apion cruentatum, Walt. At Kildale in September, 1907.

Trachyphlœus alternans, Gyll. On the sea banks at Saltburn (July, 1907).

Ceuthorhynchus contractus, Marsh, and *C. quadridens* Panz. Common at Redcar.

CLEVELAND NATURALISTS' FIELD CLUB.

SECRETARY'S REPORT FOR 1906-7.

In presenting to the Members of the Cleveland Naturalists' Field Club my NINTH ANNUAL REPORT, I have pleasure in stating that the season, generally speaking, has been a successful one, both Summer and Winter Meetings being on the whole fairly well attended; the attendance at the winter meetings being above the average. The membership is practically the same as last year, and there is, I consider, room for improvement in this respect.

SUMMER MEETINGS.—Eight meetings were arranged for the Summer months (exclusive of Yorkshire Naturalists' Union Meetings,) and with one exception (Kirkleatham) the weather conditions prevailing were favourable. The meetings were held at the following places: "Saltburn Gill," "Slapestones" "Kirkleatham" (owing to unfavourable weather only seven members attended this meeting), "Stanley Grove, Ayton," "Mulgrave Woods," "Westerdale, via Basedale," "Raisdale," and "Saltscar, Redcar." The attendance was quite up to the average.

In nearly every case localities were visited that had not recently been investigated by the Society. We were specially favoured by permission from various owners given to our members to visit their estates; in no case was the Club met with a refusal.

I am pleased to acknowledge the great assistance I had from members and others in making arrangements and acting as guides at our meetings during the past year. The meetings were by this means more than usually interesting.

The following assisted in making the arrangements and acted as guides to some of our meetings:—Rev. J. Cowley Fowler, B.A., F.G.S., Messrs. T. J. Cozens, H. Frankland, H. T. Hallimond, S. H. Harries and J. W. R. Punch.

On the occasion of the Westerdale Meeting Mr. and Mrs. C. Hood kindly entertained the party to tea.

A special meeting was held to investigate the Marine Fauna on Saltscar Rocks, Redcar, in September, when the President (Mr. H. Simpson) made the arrangements and acted as guide. The meeting was a successful one in every way. At the conclusion the President hospitably entertained the party to luncheon at Redcar.

Permission was granted to visit estates belonging to the Marquis of Normanby, The Earl of Zetland, Messrs. W. H. A. Wharton, Newcomen and Lowther. Your thanks are also due to Mr. Wynne Finch, for permission to visit his property at "Stanley Grove," and also for placing a workman at our disposal to assist in the "hunt" for "iron pan."

A Yorkshire Naturalists' Union Meeting was held at Guisborough in August, and was in every way successful. Mr. J. J. Burton was local secretary for the meeting, and others of our members assisted in the arrangements. About fifteen of our members attended the meeting.

WINTER MEETINGS.—Since the last Annual Meeting Eight Winter Meetings have been held; this series being one of the most successful we have had. With one exception (the Y.N.U. Lecture by Mr. Bayford) the whole of the papers have been given or the arrangements made by our own members.

The attendance, with one or two exceptions, was good, the Saturday evening meetings especially being well attended. The papers read were as follows:—"A Chat about Beetles," by Mr. E. G. Bayford, this being a Y.N.U. Lecture; "Smuggling days at Marske," by the Rev. F. Grant James, a most interesting and amusing paper; "Among wild plants in Teesdale," by Mr. J. T. Cozens, with lantern illustrations; "Colour," by Mr. Geo. B. Walsh, B.Sc., illustrated by experiments and sketches; "The Origin of the Cleveland

Moors," by Mr. Frank Elgee, illustrated by maps, sketches, and specimens. Mr. Elgee has had this paper printed. "History of Middlesbrough," by T. A. Lofthouse, illustrated by plans, sketches and photographs.

Two microscope and exhibition meetings were held, our President kindly arranged these, and provided some of the interesting exhibits. Many of our members lent microscopes and slides. Exhibits were made by Messrs. M. L. Thompson, Whiteley, Dodson, Frank Elgee, Saunders, Lane, Harrison and Lofthouse.

The meetings with two exceptions have been held in the rooms of the Cleveland Literary and Philosophical Society, and the Club are again indebted to them for placing rooms at our disposal.

Two of the meetings were held in the Dorman Museum kindly placed at the disposal of the Club.

By permission of the Lit. and Phil. and by invitation of the Lecturer, members had the privilege of attending a Lecture on the "Isles of Greece," delivered by Mr. W. H. Thomas.

Our thanks are due to Mr. F. W. Pearson for kindly working the lantern at two of the above meetings.

We have several microscopists connected with the Society, and probably others will join if a short series of demonstrations or lecturettes on practical microscopy could be arranged for during the winter months, certain members being responsible for the subject on each evening. I should be glad if the microscopy sectional committee would take the matter up. I do not think there is any question as to its ultimate success, and it, no doubt, would stimulate work in branches of the local Fauna and Flora that have hitherto been neglected.

MEMBERSHIP.—The membership now stands at 105. The following new members have been elected since the last Annual Meeting, Messrs. Arthur Appleyard, T. Brayshay, H. F. Dodson, William Hudson, J. W. H. Harrison, B.Sc., T. W. Saunders, and Geo. B. Walsh, B.Sc.

PROCEEDINGS.—At present the Society's income only allows of the Proceedings being published once in two years. If our membership could be materially increased or a larger sale ensured for our Proceedings we might be able to publish proceedings annually instead of bi-annually. There is a good deal of material available at present and I do not anticipate that there would be any difficulty in obtaining suitable local matter of interest to enable us to publish annually, besides local papers that have been read at our Winter Meetings that are suitable for publication. We have the promise of a valuable geological section through the Cleveland Ironstone district with notes thereon, by Mr. F. W. Allison. Papers such as these we should be in a position to publish at once to ensure the matter not being published out of the district.

There is a large number of back Proceedings (which include many valuable local papers) in the hands of the Society, the full set of Vol. I, in parts, may be obtained at 5s., this is 33 per cent. less than the published price. We shall be glad if members who have not complete sets would complete, and also if they would induce any interested in local records to purchase them.

LIBRARY.—The following works have been added to the small library during the past year. Hull Society's Proceedings Vol. III, part 4; Y.N.U. Transactions, parts 31 and 33; Baker's North Yorkshire; Yorkshire Geological Society's Transactions for 1906, The Naturalist for 1906, and Report of the Bradford Natural History Society.

SECRETARY'S REPORT FOR 1907-8.

In presenting to the Society my Tenth Annual Report I have pleasure in stating that the season generally speaking, has been quite as successful as any previous season in the Club's existence. The Summer Meetings arranged were held with one exception, more than the usual number of Winter Meetings were held and the papers presented were equal to,

if not in advance of, what we have had in previous sessions. During the past year another part of our proceedings was published, and the Membership shows a slight increase over last year.

SUMMER MEETINGS.—The programme arranged for the Summer months provided for eight meetings (exclusive of Y.N.U. Meetings) and with one exception (Boosbeck-Aysdale Gate, which was abandoned owing to very unfavourable weather) the meetings were all held; the weather conditions at the Seamer and Harlsey Meeting were, however, anything but favourable, and prevented any satisfactory investigation being made.

Meetings were held at Great Ayton, when Easby and Kildale were visited; Stokesley to Seamer; Hart when the sea banks between Hart and Black Hall were investigated and the rich characteristic limestone flora noticed; Staithes to Runswick; Marske to Saltburn along the banks, where many interesting plants were noticed; Egton Bridge, and Harlsey.

I have again to acknowledge with thanks valuable assistance I have received in making arrangements for many of the meetings from members and friends, which have made the meetings much more enjoyable and profitable.

At the Stokesley—Seamer meeting Messrs. Cozens and Elgee acted as guides, and Mr. Frank Elgee contributed to the circular for the meeting an interesting resumé of objects of interest to be observed. Mr. John Gardner, F.E.S., of Hartlepool, acted as guide to the Hart Meeting, and Mr. T. W. Saunders at the Staithes—Runswick Meeting. Mr. Simpson piloted the party at the Marske to Saltburn Meeting and thanks are also due to Mr. and Mrs. Monk who kindly provided tea for the party on arrival at Saltburn. Mr. Frank Elgee provided notes on the geological features to be noticed at the Egton meeting and also attended the meeting and acted as guide. At the Harlsey meeting the Rev. C. V. Collier, M.A., F.S.A., gave the party a short description of the various objects of interest in Harlsey Church, and also pointed out various objects of archæological interest in the immediate neighbourhood. The Rev. and Mrs. Collier kindly entertained the members to tea.

Permission was granted to visit estates belonging to J. J. Emerson, Esq., R. B. Turton, Esq., W. H. A. Wharton, Esq., Sir B. Samuelson & Co., Ltd., and Joseph Constantine, Esq., and the thanks of the Club are due to them for the privileges kindly granted.

The only Y.N.U. Meeting held in the district was at Robin Hoods Bay at Whitsuntide. It proved very interesting to those who spent the week end in the district, but to some others who essayed to visit it on the Whit Monday it will be remembered more for the rapid railway journey than anything else, members leaving Middlesbrough at 9-30, arriving at Robin Hood's Bay at 5-30, returning again at about 8-30 and arriving in Middlesbrough between one and two o'clock next morning, surely an event to be remembered.

WINTER MEETINGS.—Since the last Annual Meeting 15 Winter Meetings have been held, this being the longest series ever held in a season since the Club was formed; with three exceptions the papers have been given by members of the Club, and have been more than usually interesting.

The attendance at the meetings on the whole have been fairly satisfactory, especially at the Saturday meetings.

The first meeting was a MICROSCOPIC AND EXHIBITION MEETING, at which Mr. Simpson undertook the arrangements, and he had the assistance of Mr. Stephens and others of our members many of whom lent Microscopes. Natural History objects were exhibited by Messrs. Lawson Thompson, Frank Elgee, and T. A. Lofthouse.

At the following meetings papers were read and demonstrations given by Mr. G. B. Walsh, B.Sc., on the "Atomic Theory," and "Flame"; Mr. J. Percy Hodges on "Diatoms," with microscopic demonstrations; Mr. Frank Elgee on "Shells," and the "Marine Fauna and Terrestrial Fauna" past and present, of Cleveland (2 lectures), illustrated by diagrams, specimens, etc.; "Microscope mounting" demonstration, by Mr. Bertram Cockburn, of Redcar; "Bats, their structure and senses," illustrated by lantern slides, a Y.N.U. Lecture by Mr. Arthur Whitaker, of Barnsley;

“The Royal Arms,” illustrated by lantern slides, by the Rev. C. V. Collier, M.A., F.S.A., Vice-President of our Society; “Nature’s Marvels,” by Mr. T. J. Cozens, B.Sc., F.C.S.; “Some Notes, chiefly Geological, respecting the origin of Natural Scenery,” (illustrated by lantern slides), by the President, Mr. J. J. Burton; “The Ancient Citadels and Temples of Greece,” by Mr. W. H. Thomas; “The Beauties of the Insect World as revealed by the Microscope,” by Mr. Henry Hall, illustrated by lantern slides, by arrangement with the Manchester Microscopical Society, and “Seaweeds as Food,” illustrated by lantern slides, by Mr. H. Simpson, Vice-President.

The meetings with three exceptions have been held in the rooms of the Cleveland Literary and Philosophical Society, and the Club are again indebted to them for placing rooms at our disposal. Three of the meetings were held in the Dorman Museum kindly placed at the disposal of the Club by the authorities.

Our thanks are again due to Mr. F. W. Pearson for kindly working the lantern at our meetings.

The Club’s thanks are due to our members for so kindly coming forward and giving papers at our meetings during the Winter Season, two or three offers of papers we have not been able to avail ourselves of, but these will, no doubt, be taken advantage of for next Session.

MEMBERSHIP.—The Membership now stands at 109. The following new members have been elected since the last Annual Meeting:—Miss Appleyard, Mr. Jos. Constantine, Dr. W. J. Fordham, Messrs. Geo. Knight, Harold A. Scruton, B.Sc., Herbert and Fred Outhwaite and Mr. and Mrs. Benham.

During the year the Society lost two members by death, the Rev. F. Grant James, Vicar of Marske and a Vice-President of the Club at the time. Many members of the Club will remember with pleasure the two occasions on which he gave most interesting papers to the Club on the “Ancient Worthies of Marske,” and on “Smuggling Days at Marske,” both papers that would be well worth printing in our Proceedings if it is possible to obtain the manuscript. He would have

liked to have taken a more active part in the Club's work, but was prevented owing to his time being very much taken up with his Parish Work. By his decease the Club lost a most valuable member. A vote of condolence was passed with his widow at the meeting held at Ayton in May, and a letter of acknowledgment and thanks was received from Mrs. Grant James.

Mr. Jno. Garbutt, of Loftus, the other member who passed away early this year was a member who generally attended the meetings in the Loftus district, and was always willing to assist in making arrangements and act as guide to our members when in his locality. Only a few days before his death I received a bird skin (a Bramble Finch) from him that he wanted identifying.

PROCEEDINGS.—During the past year Proceedings for the year 1905-6 (Vol. II, part 2) have been published and issued to members. The number is well up to the average both as regards size, illustration, and value of the papers contributed.

Blocks for illustrating the Rev. J. Hawell's paper in it were kindly lent by Mr. J. W. Brotton, of Battersby. The Club is indebted to the Rev. J. Cowley Fowler, Mr. H. Simpson and others for seeing the above through the printer's hands.

Papers should have been got together for another part of the Proceedings before this but I have been much too busy to attend to it. In my opinion any quantity of suitable material could be got together for printing, amongst it being the local records and references contained in many papers delivered to the Society's Meetings at various times, namely:—the Rev. Grant James' "Marske Worthies," and "Smuggling Days at Marske," and other local notes collected by him; "Cleveland, its Geology and Scenery," by Mr. J. S. Calvert; "Origin of the Cleveland Moors," and "Cleveland Fauna, Past and Present," by Mr. Frank Elgee; "Historic Middlesbrough," by the late R. Lofthouse; Mr. Burton "Notes on origin of Natural Scenery" (local part); "Seaweeds," by Mr. Simpson; "Insect Notes, Coleoptera, Lepidoptera, &c."

I regret to say that our Proceedings seem to have a very small sale, and that they do not seem to be made widely known by our members.

LIBRARY.—The following works have been added to the Society's small Library during the past year :—Hull Society's Proceedings for 1907 ; The Naturalist for 1906 ; and the Yorkshire Geological Society's Transactions for 1907.

GENERALLY.—Our meetings have been frequently reported in the local press, and our thanks for this are due to the Editor of the "North Eastern Gazette," the "Northern Echo," and the "North Star." Our thanks are also due to the N.E.R. for kindly granting members special privileges for travelling at reduced fares and also for specially stopping trains at non-stop stations for two of our Meetings.

My thanks are due to members for kind assistance in making arrangements for meetings, and the Club's thanks are specially due to those who have given papers and acted as guides at our meetings. I personally am very much indebted to the great assistance rendered me by Mr. Frank Elgee as Assistant Secretary, and also to Mr. H. Simpson who has seen to the reporting of many of the meetings, and has also assisted me very much in connection with meetings where Microscopes were required.

In concluding my final report it will probably interest members to know that the Club since formed as the Cleveland Naturalists' Field Club has been in existence 27 years, and of this period I have now been Secretary for the past 10 years. When formed the Society had 72 members ; when I took up the position of Secretary it had about 65, now the membership is 109, and with a more active Secretary I am quite sure this number should be considerably increased. During the past years the number of Winter Meetings has increased year by year, and in the past season 15 Winter Meetings have been held, this being a record for the Club. During the time I have been Secretary 1 Volume (consisting of 5 parts) of the Proceedings has been completed and 2 parts of Volume II published.

T. A. LOFTHOUSE.



CONDITIONS AND ADVANTAGES OF MEMBERSHIP.

MEMBERSHIP.—The Terms of Membership are the subscription of an annual sum of not less than 5s. Members receive the Proceedings, copies of all Circulars for Summer and Winter Meetings, Associate Card of Membership of the Yorkshire Naturalists Union, have access to the Society's small Library, and also the privilege granted by the N.E.R. for travelling at reduced rates at excursions.

WINTER MEETINGS.—A Series of Meetings are held during the Winter months, particulars of which are sent out in the Autumn. The Secretary will be glad to hear from Members willing to give papers.

THE LIBRARY, which consists of works on Science, Natural History and Archæology, is placed (on loan) in a case in the Dorman Museum, and is accessible to Members on application to the Hon. Librarian, Mr. Baker Hudson. Donations of works on the above subjects, especially those relating to Cleveland, are at all times acceptable.

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

Any persons interested in the work of our Society are invited to become Members, even if they are not able to be active Members. Their support would be valuable and would also show that the work of the Society was not altogether unappreciated.



PROCEEDINGS OF THE CLEVELAND NATURALISTS' FIELD CLUB.

VOLUME I IN 5 PARTS. (Complete to Members 5s.)

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PROCEEDINGS
OF THE
Cleveland Naturalists'
Field Club,

1908-9.

VOL. II. PART IV.

Edited by the Rev. J. Cowley Fowler, B.A., F.G.S.

PRICE TWO SHILLINGS
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NOTES ON THE GLACIAL GEOLOGY OF THE COUNTRY
BETWEEN LOFTUS AND KETTLENESS.

BY FRANK ELGEE.

In July, 1907, I made a glacial survey of the country between Loftus and Kettleless. The result proved somewhat disappointing, very few striking features due to ice action being met with. No opportunity to make a further investigation of the area having since arisen, I propose in this paper to bring together my observations with a view to their being expanded at some future date.

Generally speaking, the district is intersected by two main valleys, that of Kilton Beck and its affluents and that of Roxby and Easington Becks, with moderately elevated land between them. A wide amphitheatre of hills sweeps around Runswick Bay from Borrowby to Newton Mulgrave Moor, and thence via Mickleby and Barnby to Goldsborough and Lythe.

The chief glacial deposit of the district is boulder clay, but in some localities there are large spreads of gravel. One of these covers the country to the south of Loftus as far as Wapley, on the ridge dividing the eastern branch of Kilton Beck from Roxby Beck. Wapley itself stands upon it. A much larger spread occurs on Easington High and Roxby Moors towards the boundary of the drift. On the former moor, the ice margin is indicated by a line of fine gravelly moraine, first described by Professor Kendall. Not far from Tranmire, where a large overflow into Eskdale crosses the North Cleveland watershed, the following section was observed in a gravel pit:—

Moor Soil.

Fine gravel passing into coaly sand.

Few inches of fine gravel.

Fine sand at base.

The erratics here were mostly small and of Cheviot Porphyrites. In one place there was a patch of ruddy boulder clay near the surface.

According to Barrow (Survey Memoir, p. 67) these gravels can be seen passing under the Upper Boulder Clay in Eskdale, and that, therefore, they are of middle glacial age. But the exact relation of the red Upper Boulder Clay to the position of the ice front at the period of maximum glaciation is a very difficult question to settle and to which I have not yet been able to devote sufficient attention. It may be remarked that as the ice margin at its maximum extension is frequently indicated by gravel mounds not overlain by the red Upper Clay, it seems difficult to understand why gravel beds should underlie the red Clay on the lower grounds—supposing the two to be continuous—unless this clay indicates a readvance of ice at a later period but not to so great an elevation. Barrow states that very little Upper Clay exists at heights much above 400 feet but the patch noted in the Tranmire section occurred at an elevation of 700 feet.

Gravel mounds occur at Greenhow, near Ellerby Bank Top at Stump How, just north of Mickleby, and just north of East Barnby at Wade's Hill. These seem to form a line of irregular moraine, a fact rendered more probable from the circumstance that the watershed from Ellerby Bank Top to Wade's Hill is trenched by several shallow grooves falling and deepening on the slopes above Lythe Beck. They are probably due to streams flowing from the melting ice margin as it stood along the watershed.

Overflow channels, with two exceptions, appear to be completely absent from the area, a fact that is somewhat surprising, seeing that the country is intersected by valleys whose drainage must have been obstructed by the retreating ice. The two exceptions are very insignificant but perfectly distinct. The most westerly occurs at the end of the ridge between Roxby and Borrowby Becks and stands at 550 feet, falls eastwards and is about 25 feet deep. Its chief peculiarity is the fact that the intake to the west is bifurcated, forming what Mr. Kendall has termed a "lateral intake." It arises from a retreat of the ice front at the intake end of the overflow, the impounded drainage then running into the first channel from another position. The channel thus somewhat resembles a letter Y laid horizontally, the two arms forming the intake. Although on a very small scale, it is, I believe, the only example of its kind in Cleveland.

The other channel occurs near Goldsborough, and is called Stangoe Carr. It is a flat floored trench falling eastwards from 550-525 feet, and is cut in drift. Both this and the preceding channel are indicative of obstructed drainage falling eastward for a very brief period.

The courses of the streams in this area in relation to their old valleys and to the drift are too well-known to need repetition here, and full details will be found in Barrow's Memoir, page 68.

Finally must be mentioned two or three valleys which though now streamless can hardly be regarded as glacial overflows, owing both to their position and their form. One of them occurs near Moor House Farm, south of Roxby Village. It falls from 660 feet westwards down the eastern slope of Roxby Beck, to about 550 feet or even lower, and occupies the position a tributary would, except that it is perfectly dry. It is excavated in the country rock.

The other valley is close to Buck Rush Farm, near Kilton Pit. It falls eastwards on the slopes of Kilton Beck, and is about 25 feet deep near the farm. It has a flat floor, and lies at an elevation of between 475-400 feet, these altitudes representing the slope and not the depth of the channel. It is perfectly streamless and excavated in drift.

That these valleys once contained streams is obvious, but whether these streams were of glacial origin, or existed at a time when the rainfall was greater, is not so obvious. Further investigation of the area will doubtless throw light on their origin.

NOTES ON THE JURASSIC FLORA OF
CLEVELAND.

BY REV. GEORGE J. LANE, F.G.S.

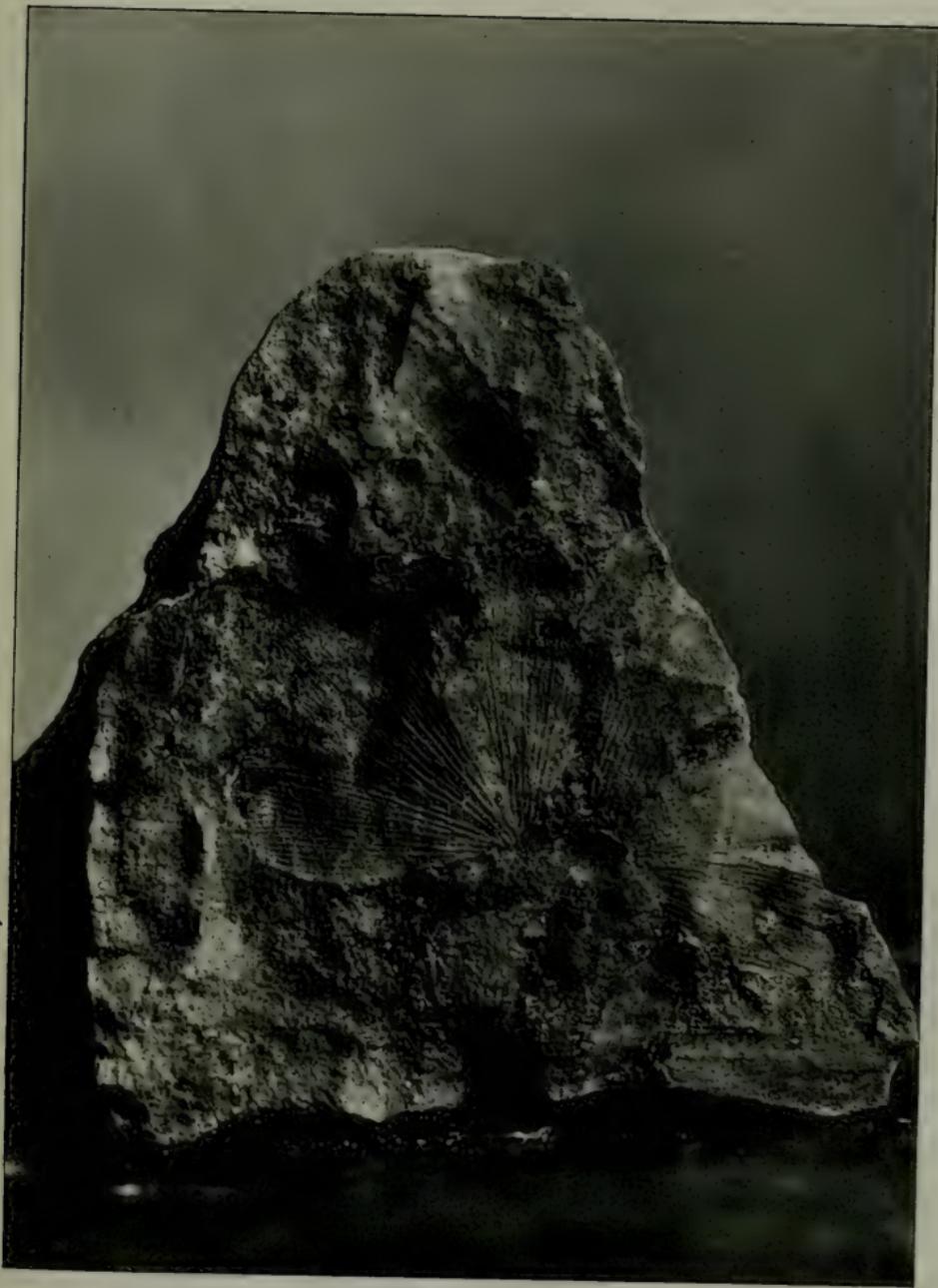
In the month of September, 1903, the Yorkshire Geologists visited the Marske Quarries. Many specimens of plants were obtained on that occasion, and the task of further investigation was urged on Mr. Saunders and myself. To this interesting work we addressed ourselves with vigour. A list of our finds was published in the *Naturalist* for March, 1909, and further genera and species in my possession will appear in a later issue, as I have opportunity. Members of our Field Club are acquainted with the geological horizon of the Marske Quarry, so that any general description is superfluous and unnecessary. Difficult specimens of the plants obtained have been submitted to Professor Seward for examination. I also had the great honour of a visit from Prof. Nathorst, of Stockholm, who determined all the plants in my possession, and encouraged me in the work. As stated in a previous number of the *Proceedings* of our Club, Mr. Elgee collaborated with me in determining the plants, and it is gratifying to him and myself to know that with few exceptions, Prof. Nathorst confirmed our results. As stated in my article in the "*Naturalist*," we, as a Club, acknowledge our indebtedness to the Rev. J. Hawell, who did some excellent pioneer work in the Marske Quarry, which resulted in the identification of seventeen species, finding for the first time in England a *Dictyozamites*, which was named after him *Dictyozamites Hawelli*.

The following list has been found by Mr. Saunders and myself:—

I. EQUISETALES—

Equisetites columnaris (Brongn).

„ *beani* (Bunb.) ?



Ginkgo digitata (Brong.) from Inferior Oolite, Marske Quarry.



II. LYCOPODIALES—

Lycopodites, sp.

III. FILICALES—

Tæniopteris major (L. & H.)

„ *vittata* (Brongn).

Sagenopteris phillipsi (Brongn).

Cladophlebis denticulata (Brongn).

„ *haiburnensis* (L. & H.) (see illus.)

Laccopteris polypodioides (Brongn) ?

Todites Williamsonia (Brongn).

Coniopteris hymenophylloides (Brongn).

IV. CYCADOPHYTA—

Flower of *Williamsonia pecten* (Phill.)

„ „ *gigas* (L. & H.)

Williamsonia gigas (L. & H.)

„ *pecten* (Phill.)

Otozamites beani (L. & H.)

„ *graphicus* (Leck.)

„ *parallelus* (Phill.)

„ *feistmantelli*, Zign.

Nilssonia compta (Phill.)

„ *mediana* (Leck.)

„ *tenuinervis*, Nath.

„ *schaumburgensis* (Dunk.) (see illus.)

Dietyozamites Hawelli, Sew.

V. GINKGOALES—

Ginkgo digitata (Brongn.) (see illustration)

Baiera gracilis, Bunb.

„ *phillipsi*, Nath.

„ *lindleyana* (Schimp.)

Czekanowskia murrayana (L. & H.)

Beania gracilis, Carr. ?

VI. CONIFERALES—

Cheirolepis setosus (Phill.)

Araucarites cone

Pagiophyllum williamsonia (Brongn.)

Brachyphyllum mammilare (Brongn.)

ROMAN REMAINS AT WHORLTON.

BY REV. J. C. FOWLER, B.A., F.G.S.

It is always interesting to watch excavations, for you never know what may turn up. A year or more ago, during draining operations in the piece of land added to the old Churchyard, the workmen came upon some broken pottery which I recognised as Roman. On taking the fragments up to the British Museum, the Professor of the British Roman Department at once pronounced each and every fragment to be Roman, very coarse and of local make—there was no Samian ware.

This find proves occupation, so I have now the satisfaction of having proved Whorlton (whatever Roman name it had) to have been a Roman Settlement. In connection with this discovery, it is interesting to note that one of the Earthworks across the road, N.W. of the Old Church, has a decided Roman look, and appears to have been a four-square Roman Station, and it is worth mentioning that a Roman Road extended from Thornton-le-Street through Bullamoor and Deighton straight to the Tees, and therefore only some five or six miles from this supposed camp—merely an outpost, of course—and yet one of considerable military importance. A large number of Roman Coins were found at Whorl Hill, near the Church, a century ago, but they did not prove settlement, as coins may be found anywhere.

Dr. Atkinson discovered a Roman Road in the Parish of Danby, but we cannot, so far, link it up with Whorlton. The fragments of pottery are in the Museum at Middlesbrough, and may be seen there.

MOORLAND RESEARCH IN 1909.

BY FRANK ELGEE.

The investigation of the Cleveland Moors having reached the systematic stage, it is proposed to embody the chief results in a series of annual reports in the Proceedings, of which this paper is the first. Many of the facts contained in the ensuing synopsis were the subject matter of a lecture delivered to the Club on November 6th, 1909.

CLIMATE

The climate of the moors is of great importance in their economy, and it will, therefore, be of value to place on record the atmospheric conditions of the moors from year to year. The effect of the weather of 1909 upon the moorlands was marked. Owing to the extremely heavy rains of June, July and August, normally dry moors became wet, moderately wet moors were half converted into bogs, and the wettest moors of the watershed and the slacks were almost impassable. On the moors just east of Saltersgate Inn large pools, hollows and artificial drains were full of water on August 7th, after four days' hot sunshine which caused the submerged vegetation to putrefy and emit quantities of marsh gas.

Weather, such as we experienced during the year, would, if continual, produce a type of vegetation peculiar to the wettest moorlands. The saturation of the vegetation would, doubtless, lead the plants typical of wet moors to spring up on the normally drier moors. The absence of sunshine and saturation of the atmosphere caused the heather to develop fewer flowers than usual. This indicates a smaller absorption of food materials both from the soil and from the atmosphere. Although the inrolled leaf of the chief ericetal plants enables them to transpire under very unfavourable conditions, the super-saturation of the air with water vapour has this year clearly interfered with the process of transpiration. The moor soil was likewise cold and wet up to the end of July, a circumstance which still further retarded the development of blossom:

On warm days, after rain, the water vapour that is being drawn from the damp moor soil and plants can be easily seen when the moor edge is projected against the skyline in proximity to the observer. The air, though clear, is seen to flow over the tops of the plants, and presents a somewhat similar appearance to heated air rising from a stove. In the local dialect this appearance is known as "summer geese," or "summer colts."

SWIDDENS.

The bare spaces caused by burning the moor are called swiddens, and present special features of plant life differing considerably from those of the undisturbed surrounding vegetation. Special attention was directed to these swiddens during the year, and the results published in the *Naturalist* for January, 1910, under the title of "The Vegetation of Swiddens in North East Yorkshire." This paper dealt solely with the present appearance of the swiddens, but observations are still required which will elucidate the succession of species upon them. Hence it is proposed to follow the aspects of the burnt spaces from year to year, and as it is necessary to commence with newly burnt swiddens, it will be advisable to note the dates on which they are formed.

The lower parts of Ewe Crag Slack were burnt in the spring and thousands of grit boulders rendered conspicuous on the slopes.

An extensive fire occurred on the summit of Kempswithen on Easter Sunday (April 11th) and took some hours to extinguish.

PLANT ASSOCIATIONS.

The survey of the moorland plant communities has been continued during the year, and though much interesting material was obtained, nothing of a very remarkable nature has to be recorded. Notes, more or less detailed, were made of the following moors:—

STONY RIDGE	<i>Eriophoreta</i> (Cotton Grass Moor)
PIKE HILL MOSS	do.
YARLSEY MOSS	Large <i>Juncetum</i>
MAY MOSS	<i>Erica tetralix</i> Moor, the finest hitherto observed in N.E. Yorkshire.

The above named moors are on the watershed and are very wet at all times.



Pike Hill Moss Peat Holes, Gt. Glaisdale Head.

[Photo, Frank Elgee



- GLAISDALE RIDGE (lower end). *Nardus* Moor.
 FREEBOROUGH SKIRT (east of the hill). *Molinietum*
 (Flying Bent) on large scale.
 BLOWORTH BECK. Extensive *Junceta*.
 EASINGTON AND GIRRICK MOORS. *Junceta* and wet
Calluna Moors with *Molinia varia*.
 COLD MOOR. Bilberry Slopes.
 STOCKDALE. Woodland Vegetation and Bilberry
 Slopes.
 CRANIMOOR. Bilberry Slopes.

Besides the above, notes were taken of the Bilberry and Bracken Slopes in Westerdale, Danby Dale, and Baysdale. A hitherto undetected feature was the difference to be observed in slopes facing north and south respectively; the former being almost invariably wetter with *Junceta* and much Bilberry; the latter being much drier and more dominated by Bracken and *Calluna*. Observations were also made on the plant life of thick peaty moors other than *Eriophoreta*. No Sweet Gale was found within the areas investigated, a circumstance confirmatory of its restriction to the south eastern moorland region probably to the south east of a line drawn from the north of Robin Hood's Bay to the village of Hutton-le-Hole.

PEAT BEDS.

Several Peat Beds have been examined with special reference as to their containing the remains of trees with results confirming previous conclusions, viz.:—that the higher moors were never forest or woodland, and that the slopes and slacks were formerly clothed with Birch and Oak. The following are the peat deposits in question:—

- SLOPES OF KEMPSWITHEN. Trees, Altitude, 775 feet.
 NORTH OF DANBY BEACON. Trees, Altitude, 900 feet.
 PIKE HILL MOSS. No trees, Altitude, 1,050 feet (see illustration).
 STONY RIDGE. No trees, Altitude, 1,400 feet.
 EASTERN HEAD OF FARNDALE. Trees, Altitude, 1,200 feet.
 SEAVY HILL (near Trough House). No trees, Altitude, 1,390 feet.
 THE SWANG, ST. HELENA, DANBY DALE (on ledge on side of valley). Trees, Altitude, 1,000 feet (see illustration).

Four kinds of peat deposits may now be recognised on the moors :—

- 1.—Hill peat on the flat high moors.
- 2.—Peat of the glacial slacks.
- 3.—Peat at the head of moorland valleys.
- 4.—Peat of moorland slopes.

The last three kinds almost invariably contain the remains of trees, the first never. During the coming year it is intended to ascertain definitely the character of the tree remains and the proportion of Birch to Oak established. Our peat beds present one marked contrast to those of Scotland. The Scotch deposits contain Birch and Pine in abundance; the Cleveland, Birch and Oak in abundance, but the Pine tree is rarely or never met with. Nor do the peaty beds of the watershed exhibit that denudation into peat hags which is conspicuous on the Scotch Hills (see Lewis, Peat Dep. of Scotland, Trans. Royal Society of Edin.)

MOOR PAN.

Special attention was also directed to this important feature of moorland soils, and its existence proved in various parts of the moors where it probably covers a very large area. It has been noted at the ensuing localities :—

Great Ayton, Danby Low Moor, Rosedale Head Moors, at the head of Stockdale where a section several yards in length was observed in a gully, on the ridge between Glaisdale and Butler Beck, above the Kellaways Rock on Girrick Moor, on Rudland Rigg between Farndale and Bransdale. In the last locality the section was very remarkable, the pan being contorted and nearly two inches thick. Pan is not always visible in sections owing to the action of frost, and therefore conclusions as to its non-occurrence must always be doubtful.

FAUNA.

Some work was done on the insects, especially Coleoptera and Lepidoptera, but no regular series of observations was made. Nevertheless some facts of interest have to be noted. *Scodiona belgaria* was abundant on the Castleton Moors during the first week of June, whilst in May, *Cnephasia politana* was numerous on the summit of Cold Moor at an elevation of 1,300 feet. At the same altitude *Hadena glauca* occurred.



Cotton Grass (*Eriophorum angustifolium*) in fruit, Danby Dale, July, 1909.

[Photo. Frank Elgee



Whatever insects were collected were carefully labelled with full details as to their locality and altitude. A peculiar species of blind Centipede (*Geophilus*, sp.) was frequent on Kempswithen under stones.

A Viper was found dead by some visitors on Danby Low Moor near the Guisborough road. This snake is decidedly rare in this district. In the course of years of rambling on the moors I have only seen one, and that was on Sleights Moor, in August, 1907. Natives of the district confirm this rarity of the Viper. The name Hagworm is no clue to the presence of the snake for the same term is also applied to the Slow Worm, a totally different reptile.

In June, a deserted Curlew's nest was found on Kempswithen on a dry swidden, and a Grouse nest with newly laid eggs was found on Easington High Moor, on June 6th.

PHOTOGRAPHIC SURVEY.

Progress has been made with a photographic survey of the moors, and photographs have been taken of geological, archaeological and botanical subjects. Several prints of these were presented to the Club's Albums.

REPORT ON COLEOPTERA OBSERVED IN
CLEVELAND.

BY M. LAWSON THOMPSON, F.E.S.

The following Report on Beetles occurring in the Cleveland District is compiled from observations made during 1909, except in a few instances. Mr. G. B. Walsh, B.Sc., has kindly contributed some notes on local species, the result of his own examination of various localities within the area of our investigations. Notwithstanding the weather conditions being far from favourable during most of the season, our combined efforts have added some interesting insects to the list of previously recorded Cleveland Coleoptera, which now numbers 950 species.

COLEOPTERA.

Cychnus rostratus, L. On Eston Nab (G. B. Walsh).

Notiophilus substriatus, Wat. At Eston, on the Coast.
June.

Dyschirius globosus, Herbst. At Eston Marshes; also near Goathland (Y. N. U. Meeting, 1903).

Bradycellus placidus, Gyll; *B. cognatus*, Gyll; *B. collaris*, Payk; and *B. similis*, Dej. On Eston Nab (G. B. Walsh).

Bradycellus verbasci, Duft. Near Eston, on the Sandhills.

Amara convexuscula, Marsh. At Eston, on the banks of the Tees. Common in September.

Bembidium quinquestriatum, Gyll. On the banks of the Tees at Eston. September.

Aëpus marinus, Ström. At Eston, under masses of *Zostera* at high-water mark on the shore. May.

Cœlambus confluens, F. At Marton (G. T. Rudd); *C. novemlineatus*, Steph. On Eston Nab (G. B. Walsh).

Hydroporus umbrosus, Gyll, and *H. morio*, Dej. On Eston Nab (G. B. Walsh).

Rhantus bistriatus, Berg. Marton, 1839. (Steph, Man. p. 72). Eston Nab (G. B. Walsh).

Oxypoda opaca, Grav. At Middlesbrough (G. B. Walsh).

Drusilla canaliculata, F. On Eston Nab, in nests of *Formica fusca* (G. B. Walsh).

Homalota æneicollis, Sharp. At Saltburn, under bark. One specimen in 1896.

Homalota nigricornis, Th. At Eston, in a dead bird on the coast. One specimen in September.

Phytosus balticus, Kraatz. At Eston, under masses of *Zostera* on the shore. May.

Hygronoma dimidiata, Gr. At Kildale, in a marshy place. Early in September.

Tachyporus pusillus, Grav. Common at Saltburn; Kildale.

Tachinus laticollis, Grav. At Middlesbrough (G. B. Walsh).

Heterothops binotata, Grav. At Eston, on the shore. May.

Quedius umbrinus, Er. At Kildale, amongst rotting wood, in a marshy place. Early in September.

Leistotrophus nebulosus, F. At Kildale (G. B. Walsh).

Ocyopus fuscatus, Grav. At Eston, on the coast. One specimen in September.

Philonthus splendens, F. At Kildale (G. B. Walsh).

Xantholinus longiventris, Heer. At Eston, on the Coast.

Lathrobium boreale, Hoch. At Saltburn, in May, 1893.

Stilicium orbiculatus, Payk. At Hutton Rudby (G. B. Walsh).

Stenus speculator, Lac. ; *S. pubescens*, Steph. ; *S. brunipes*, Steph. ; and *S. impressus*, Germ. Common at Marton (G. B. Walsh).

Stenus pusillus, Er. At Eston.

Stenus junco, F. ; *S. nitidiusculus*, Steph. ; and *S. similis*, Herbst. At Kildale (G. B. Walsh).

Homalium septentrionis, Th. In Saltburn Wood, amongst decaying fish used to attract beetles. One specimen of this rare insect in July, 1894.

Homalium riparium, Thoms. At Eston, in a dead bird on the shore.

Homalium striatum, Grav. At Kildale, in a marshy place.

Eusphalerum primulæ, Steph. Common at Kildale (G. B. Walsh).

Anthobium sorbi, Gyll. At Grinkle.

Proteinus ovalis, Steph. ; and *P. brachypterus*, F. At Marton (G. B. Walsh) ; also at Eston.

Megarthus affinis, Mull. At Marton (G. B. Walsh).

Choleva angustata, F. At Saltburn.

Choleva agilis, Ill. At Middlesbrough (G. B. Walsh).

Trichopteryx sericans, Heer. Saltburn, in vegetable refuse. July, 1907.

Subcoccinella 24-punctata, L. At Kildale, in a marshy place.

Scymnus suturalis, Thunb. Common at Scotch fir. Eston (G. B. Walsh); Grinkle.

Micropeplus porcatus, Payk. At Kildale, in a marshy place.

Cartodere ruficollis, Marsh. Common at Marton (G. B. Walsh).

Melanophthalma fuscata, Hum. At Eston, on the coast.

Atomaria fuscata, Sch. At Eston, on the coast.

Byrrhus fasciatus, F. At Eston, on the shore.

Aphodius rufescens, F. Common on the coast at Eston in dung. August.

Serica brunnea, L. At Kildale.

Melolontha vulgaris, F. At Stokesley.

Corymbites quereus, Gyll. At Runswick; also near Goathland.

Helodes marginata, F. At Kildale (G. B. Walsh); also at Runswick.

Cyphon coarctatus, Payk; and *C. variabilis*, Thunb. Common at Kildale and Runswick.

Ancistronycha abdominalis, F. At Great Ayton, May, 1900 (O. C. Hudson); also near Goathland (J. T. Sewell).

Telephorus paludosus, Fall. Near Goathland (Y.N.U. Meeting, 1903—H. Ostheide).

Grammoptera tabacicolor, De G. Near Goathland (Y.N.U. Meeting, 1903—H. Ostheide).

Pogonochærus bidentatus, Th. Near Goathland (Y.N.U. Meeting, 1903—H. Ostheide).

Leiopus nebulosus, L. At Kildale, June (G. B. Walsh).

Phytodecta pallida, L. Near Goathland (Y.N.U. Meeting, 1903—H. Ostheide).

Luperus flavipes, L. At Kildale, June (G. B. Walsh).

Longitarsus luridus, Scop. Common at Kildale.

Crepidodera smaragdina, Fond. At Runswick, July.

Tenebrio molitor, L. Common at Middlesbrough.

Rhinosimus ruficollis, L., and *R. viridipennis*, Steph. At Kildale (G. B. Walsh).

Apion radiolus, Kirby. Common at Runswick, July; also *A. æthiops*, Herbst.

Otiorhynchus rugifrons, Gyll. Near the coast at Eston (G. B. Walsh).

Hypera pollux, F. At Kildale, in a marshy place. One specimen early in September.

Hypera trilineata, Marsh. At Saltburn.

Grypidius equiseti, F. At Runswick, on *Equisetum maximum*, July.

Erirhinus acridulus, L. At Kildale, in a marshy place.

Dorytomus pectoralis, Gyll. At Runswick, July.

CLEVELAND LEPIDOPTERA IN 1908.

 By T. ASHTON LOFTHOUSE, F.E.S.

*Denotes Species recorded in Proceedings for first time.

During the Spring and Summer of this year I was unable to devote much time to working for Lepidoptera; on the few times that I tried "Sugar," in July, common moths came to it fairly freely, but, during August and early September practically nothing came at all; towards the end of September and in early October a few *Orthosia macilenta* were attracted at Kildale.

RHOPALOCERA *Cœnonympha typhon*. A few specimens of this butterfly occurred at Glaisdale in July; they are much darker than the Scotch specimens of this butterfly I have seen, and some of the undersides approach somewhat the forms taken on the Lancashire Mosses; they seem to be a form in between the Scotch and Lancashire forms.

BOMBYCES. *Hepialus hectus*. This moth was flying freely near Battersby on the evening of June 25th, from 8 to 8-30, including males and females, the latter mostly being very dark, and some of the males were nicely marked.

TORTRICES. **Tortrix podana*. Occurs in garden at Linthorpe, Middlesbrough.

**Tortrix viburnana*. On Moors at Glaisdale in July.

Mixodia schulziana. On Moors at Glaisdale in July.

Pamplusia mercuriana. On Westerdale Moors.

**Coccyx tædella*. Among Spruce Fir at Ingleby Greenhow in May.

**Dichrorampha tanaceti*. Flying freely about Yarrow at Normanby in early July.

**Argyrolepia hartmanniana*. Single specimen at Ingleby Greenhow in June.

TINEÆ. **Scardia corticella*. Several sitting about on decayed Alder tree trunk at Kildale in July.

**Micropteryx thunbergella*. At Easby in May.

**Teleia proximella*. On Alder tree trunks at Ingleby Greenhow in May.

Elachista kilmunella. Westerdale Moors in July.

**Lithocolletis frolichella*. On Alder at Ingleby Greenhow.

CLEVELAND LEPIDOPTERA IN 1909.

*Denotes species recorded in Proceedings for first time.

The conditions prevailing during the Spring and Summer were not very favourable, for the most part being sunless, wet and cold, with the exception of a few days in early August.

The first insects noticed were on February 20th, when *Phigalia pedaria*, *Hybernia leucophearia*, and a good number of *Hybernia rupicapraria* were noticed, although it was extremely cold.

BOMBYCES. *Nemeophila plantaginis* and Var. **hospita*. Took a female specimen of this moth off a wall alongside Kildale Moors, from which I obtained ova, and succeeded in rearing a most interesting second brood of over one hundred specimens, which included about twenty-six specimens of the *Hospita* variety (in which the creamy yellow ground colour in the male is replaced by white), 31 type males and 55 females, some of which varied considerably.

Hepialus sylvanus. Very plentiful on one or two favourable evenings in August at Kildale.

NOCTUÆ. *Tapinostola fulva*. Plentiful and variable about Bents on Eston Moors in September.

Neuronia popularis. A female taken on Eston Moors in September.

Celæna haworthii. A few at heather bloom on Eston Hills.

Stilbia anomala. Specimens taken among Bracken at Kildale, also single specimen at Eston.

Orthosia suspecta. Several at heather bloom on Eston Hills, mostly worn specimens, in September.

Orthosia macilenta and *lota*. At sugar at Normanby and Middlesbrough.

Anchocelis lunosa. Specimen at sugar at Normanby.

Xanthia citrigo. At sugar at Normanby in September.

Polia flavicincta. Normanby.

GEOMETRÆ. *Scodiona belgiaria*. Larvæ fairly plentiful on Heath near Glaisdale, also noticed on Moors at Kildale. The specimens bred are much darker than southern examples of this insect.

Oporabia filigrammaria. A few specimens in fine condition taken on Kildale Moors at end of August.

Larentia salicata. Kildale.

Coremia designata. Kildale.

PYRALIDES. *Scoparia angustea*. Normanby on sugar.

CRAMBI. *Crambus pascuellus*. Common and quite fresh on Marshes near Redcar at end of July.

Crambus inquinatellus. Common among bracken at Kildale.

TORTRICES. *Peronea sponsana*. Normanby.

**Peronea comparana*. Few about hedge at Normanby, also noticed at Kildale.

Peronea variegana. Plentiful about Normanby, including vars. *Albana* and *Semi-albana*.

**Penthina sororculana*. Danby.

Penthina dimidiana. In garden at Linthorpe.

Pardia tripunctana. Several at Kildale.

Grapholitha ramella. Among Birch at Ingleby Greenhow.

Grapholitha geminana. Kildale, flying in sun about Heath.

**Phlœodes tetraquetana*. Beaten out of Birch on Eston Hills.

Ephippiphora similana. Common among Birch at Ingleby Greenhow, also noticed at Eston.

Ephippiphora turbidana. Kildale.

Olindia ulmana. On leaves of Butterbur at Kildale.

Trycheris aurana. Staithes.

TINEÆ. **Tineæ lapella*. Easby-in-Cleveland.

**Micropteryx calthella*. Easby-in-Cleveland.

**Gelechia mulinella*. Kildale.

**Gelechia diffinis*. Castleton.

**Gelechia celerella*. Redcar.

**Lita æthiops*. Near Kirby-in-Cleveland.

- **Teleia notatella*. Redcar.
- **Glyphipteryx thrasonella*. Staithes and Kildale.
- **Glyphipteryx fischeriella*. Kildale.
- Argyresthia sorbiella*. Danby.
- **Argyresthia brochella*. Kildale.
- Ornix anglicella*. Kildale.
- **Coleophora discordella*. Redcar.
- **Coleophora murinipennella*. Redcar.
- Coleophora laripennella*. Kildale.
- **Coleophora gryhipennella*. Staithes.

THE SPIDERS OF THE MIDDLESBROUGH
DISTRICT.

By J. W. H. HARRISON, B.Sc.

The above title in general terms describes the district that has produced the Spiders included in the following catalogue. Nevertheless, certain species have been included which have occurred on the Durham Coast, because these Durham localities have been worked previously by the Field Club for other groups.

An examination of the list will betray the fact that the bulk of the species belong to the *Theridiids* (*sens. lat.*) Several reasons may be given for this fact. First, the *Theridiidae* and *Argiopidae* are by far the most extensive of the families represented in Britain. Again, as no collecting was done for nine weeks in summer, other families which mature during the summer months to a greater extent than the *Theridiids* do, have thus escaped observation in the adult condition. Probably, too, the sub-alpine character of the chief localities worked has further extended the list of this family.

The district is apparently a very rich one in *Arachnids*, and two species have been discovered new to Britain. One of these, *Hypselistes florens*, provides the first European record. The other has been recorded previously from France. Besides these, there are several species new to Yorkshire. These, amongst others, include *Erigone arctica*, *Troxochrus scabriculus* and *Cnephalocotes interjectus*. Other records extend the range of very rare and little known forms. Particularly worthy of notice in this group are *Caledonia evansii*, *Evansia merens*, *Leptyphantès nebulosus* and *Porrhomma miserum*.

In all, a little more than five months' collecting has produced these species. Investigations made further afield in localities of a more varied nature will considerably extend this list.

My best thanks are due to the Rev. J. E. Hull, M.A., of Ninebanks, Northumberland, who has kindly examined every specimen, whether its identification has been certain or not, in order to make the list as accurate as possible.

ORDER I.—ARANEAE.

FAMILY—DYSDERIDAE.

Segestria senoculata (Linn.) This peculiar-looking Spider is common everywhere in the district under bark, but is very abundant in the walls which cross the moors.

FAMILY—OONOPIDAE.

Oonops pulcher (Templ.) This curious pink species is not uncommon in the district. It occurred freely among stones and in dead leaves at Eston in spring, and also in hedge-side rubbish near Nunthorpe Station in October.

FAMILY—DRASSIDAE.

Drassus lapidicola (Walck.) This species occurs abundantly under stones on the Moors at Eston and Ayton. Individuals may be obtained at all seasons, but adults were most plentiful in June.

Drassus troglodytes (Koch.) Commonly and widely distributed with the last species.

Clubiona trivialis (Koch.) One or two examples were beaten from the heather in May and June at Eston and in Lonsdale. Commoner at Eston in October.

Clubiona reclusa (Camb.) Shaken from hedge debris at Marton, Gunnergate, Nunthorpe and Eston in May and June. Females spun up with ova were very common on various plants at Hesleden in July.

Clubiona grisea (L. Koch.) A single adult female was shaken from *Artemisia maritima* in June in Greatham Marsh.

Clubiona holosericea (De Geer). One female at Black Hall Rocks, taken from *Iris pseudacorus*.

Clubiona lutescens (Westr.) Very common indeed in the Park in dead leaves, scraps of paper; also common on the waste ground between Grove Hill and North Ormesby. Rare at Nunthorpe and Black Hall Rocks. Adult in June.

Clubiona diversa (Camb.) Beaten not uncommonly from heather at Eston in April and October; Lonsdale in June.

Clubiona brevipes (Bl.) Beaten from alders by Mr. Walsh and myself in June. Rather a rare species.

Clubiona compta (C.L.K.) One of the most distinct of the *Clubionae*, very common in grass on Eston Moor. Less common at Marton in hedge-sides.

Anyphoena accentuata (Walck.) A somewhat uncommon species, but an adult female was beaten from Alders in Kildale Woods in June.

Micaria pulicaria (Sund.) I took this ant-like Spider from nests of *Lasius niger* at Eston and in Lonsdale. It is not recognised as a genuine mymecophile, although its appearance suggests such a habit.

Agroeca brunnea (Bl.) Not very common at Eston on the heather. Immature in July, but an adult male in October.

FAMILY—THOMISIDAE.

Xysticus cristatus (Clk.) This very common crab-spider has been found in May and June at Eston, Ayton and in Greatham Marsh. At Redcar in October.

Philodromus cespitum (Walck.) Common everywhere with the next species, from which it is but doubtfully distinct.

Philodromus aureolus (Clk.) Beaten with the last from whins, laurel, etc. Forms connecting it and *P. cespitum* occur on the continent.

Tibellus oblongus (Walck.) Shaken from long grass at Eston. This spider can perform the apparently impossible, by making itself invisible on a rush stalk.

FAMILY—SALTICIDAE.

Salticus scenicus (Clk.) Common on ash trees, walls, fences and gate posts. Can be seen any sunny day in June stalking its prey. I have seen it in town running up and down a wall at the top of Abingdon Road. There is a fairly strong colony on a fence near the Park.

Salticus cingulatus (Panz.) This rather rare spider has occurred freely in several places; abundantly at Ayton under bark on larch trees, one in a wall in Lonsdale, commonly on *Pinus sylvestris* on Kildale Moor, and one on a gate post at Nunthorpe.

FAMILY—AGELINIDAE.

Cryphoeca silvicola (C.L.K.) A very common spider among the pine needles and under bark at Eston and Ayton, and on Kildale Moor. A northern form.

Cryphoeca (Sp. ?) An immature individual of the genus *Cryphoeca*, not referable to *C. silvicola*, was taken on Eston Moor. I believe the specimen was in a nest of *Lasius niger*.

Cœlotes atropos (Walck.) Another northern spider found under stones on all the moors. Extraordinarily abundant in the quarry on the brow of Eston Nab.

Tegenaria derhami (Scop.) This is the common house-spider of the district, although I have found both of the two common *Amaurobii* in houses here.

Textrix denticulata (Oliv.) Very common in the walls crossing the moors.

FAMILY—HAHNIIDAE.

Hahnia montana (Bl.) Common enough in moss on all the moors.

FAMILY—LYCOSIDAE.

Pirata piraticus (Clk.) Common in all the bogs in the Hills in June.

Trochosa ruricola (De Geer.) A very large wolf spider, found commonly under stones at Grangetown, Eston, Ayton.

Trochosa terricola (Thor.) Common under stones everywhere.

Lycosa amentata (Clk.) This and the following five species are the blackish spiders one sees dashing about amongst the herbage in early summer. Common on all the moors, and also found at Redcar.

Lycosa lugubris (Walck.) Immature specimens were very plentiful at Eston in May.

Lycosa pullata (Clk.) Common everywhere.

Lycosa herbigrada (Bl.) Immature individuals in early May on the North side of Eston Moor. A rare spider.

Lycosa palustris (Linn.) One in Lonsdale at the end of May.

Lycosa nigriceps (Thor.) Common on all the Moors. Was exceedingly abundant amongst *Erica tetralix* and *Empetrum nigrum* in Normanby Intake Plantation in September.

FAMILY—DICTYNIDAE.

Dictyna arundinacea (Linn.) Immature examples were to be found in profusion in early spring, both at Eston and Ayton.

Dictyna uncinata (Westr.) Not uncommon at Marton, Gunnergate and Nunthorpe. Chiefly on whins.

Amaurobius fenestralis (Stroem.) One of our commonest spiders. There is a very strong colony in Albert Road, which seems badly infested with ichneumons. I hope to breed this ichneumon and thus discover the species later. Although plentiful here from sea level to an altitude of 1,000 ft., it is rare in the South and on the Continent.

Amaurobius similis (Bl.) Common in town in walls, greenhouses, etc. Not uncommon at Marton and Redcar.

FAMILY—MIMETIDAE.

Ero furcata (Vill.) Common at Eston and Ayton. The cocoon, which curiously resembles a captive balloon with cable complete, was very plentiful under stones on Eston Nab in March and April.

FAMILY—THERIDIIDAE.

Theridion lineatum (Bl.) This is the very pretty, but common, spider which spins the herbage together in August.

Theridion sisypium (Clk.) Another very beautiful species beaten from gorse at Nunthorpe.

Theridion pallens (Bl.) Beaten from various trees—yew, laurel, etc., at Gunnergate, Nunthorpe, Lonsdale and Ormesby.

Steatoda bipuncta (Linn.) On old windows in a stable at Ayton in May.

Robertus lividus (Bl.) A perfect nuisance, under stones everywhere, from sea level to the highest moors.

Pholcomma gibbum (Westr.) Occasionally from grass in the Park and up Marton Road. Commoner at Eston.

FAMILY—ARGIOPIDAE.

SUB-FAMILY I.—LINYPHIINAE.

Ceratinella brevis (Wid.) Eston, in October, amongst dead leaves.

Ceratinella brevipes (Westr.) Several specimens were taken in Lonsdale in June.

Lophocarenum Mengii (Simon). I took several specimens of this somewhat local species from ants' nests and rushes at Eston in April and October.

Cnephalocotes interjectus (Cb.) This rare spider was very common indeed at Redcar. I saw more than thirty under one stone on the beach.

Cnephalocotes elegans (Cb.) With the last-named species at Redcar, but only sparingly.

Tiso vagans (Bl.) Widely distributed in the district covered in these notes—Eston, Guisbrough, Hesleden and Middlesbrough.

Troxochrus scabriculus (Westr.) A male on the Redcar sand-hills. Also at Leven Bridge.

Troxehrus Sp.? Another species of this genus, in all probability *Tr. ignobilis*, occurs at Ayton.

Caledonia Evansii (Cb.) Fairly plentiful under old rubbish from a garden on the North side of Eston Nab. Also taken in Normanby Intake Plantation. This is a very interesting take, as it has only been taken in four localities previously.

Savignia frontata (Bl.) Common enough at Eston and in Lonsdale, both in spring and autumn.

Diplocephalus Beckii (Camb.) This very rare species has occurred in moss both at Eston and at Ayton.

Diplocephalus cristatus (Bl.) Common enough at Nunthorpe and at Redcar, also in Normanby Intake Plantation.

Diplocephalus latifrons (Camb.) Apparently quite common everywhere, even in the Park.

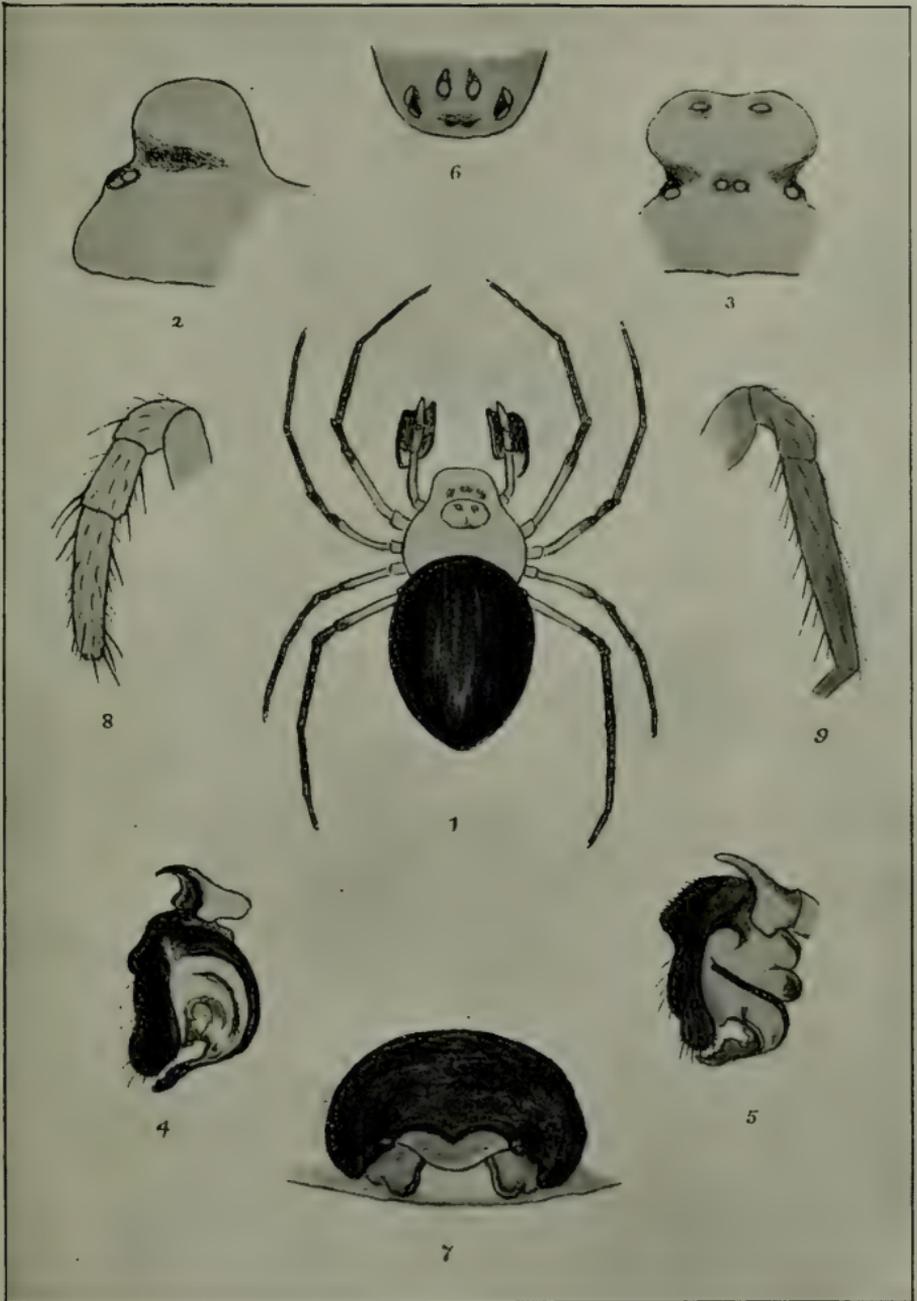
Diplocephalus fuscipes (Bl.) Common and widely distributed—Eston, Ormesby, and even in grass tufts in Middlesbrough.

Diplocephalus picinus (Bl.) Fairly plentiful on oaks and alders in Kildale Woods in June.

Tapinocyba praecox (Cb.) Shaken from moss in Lonsdale in June. A rare species.

Tapinocyba pallens (Camb.) Shaken from pinewood debris in Normanby Intake Plantation.

Lophomma punctatum (Bl.) In boggy holes on Eston Moor.



Hypselistes florens, (cb.)

1. Male.
2. Caput of Male, side view.
3. Caput of Male, front view.
4. Left palpus of male, tarsus and tibia, side view.
5. Left palpus of male, tarsus and tibia, side view but rather more from behind and above.
6. Eyes of female, from above.
7. Epigyne of female.
8. Left palpus of female.
9. Female, tibia and patella of front leg.



Lophomma herbigradum (Bl.) Rather plentiful everywhere on Eston Moor, but scarcer in Middlesbrough. Found amongst rushes and leaves.

Pocadienemis pumila (Bl.) A curious little spider taken among grass at Hesleden. Also at Staithes.

Pepocranium ludicrum (Camb.) Not uncommon on the Moors at Eston and at Lonsdale.

Metopobactrus prominulus (Camb.) Two or three specimens were taken at Hesleden in July.

Minyriolus pusillus (Wid.) Amongst pine needles in Normanby Intake Plantation. Also in Wilton Wood.

Entelecara (*Hypselistes*), **florens** (Camb.) This very interesting addition to the British fauna was discovered in one of the bog holes on the northern slope of Eston Nab. Three specimens in all were taken—a male in October and two females in November. With the females a cocoon was found. This cocoon was the shape of a tabloid, and contained at the most thirty eggs. Similar cocoons were discovered amongst rushes near the brow of the hill.

This species had previously been reported from North America, and forms another member of the somewhat large group of animals and plants common to both hemispheres, of which we have so many representatives in the Cleveland District. (See plate).

Evansia merens (Camb.) This mymecophile spider is very abundant in our district, and is just as common on the other side of the river. It occurs with *Lasius niger* and *Formica fusca*, both at Eston and in Lonsdale. Affected nests are easily distinguished, for the characteristic flat cocoon containing but few eggs may be found on the roofing stone of such nests. They are apparently two broods each year in this district, for adults of both sexes followed by immature specimens may be found in spring, and there is a new generation of "babies" in September. A large number of the specimens found with *Formica fusca* on the Guisbrough side of Eston Moor are much darker and more clearly marked than Pickard-Cambridge's type

Wideria antica (Wid.) Found pretty commonly under stones and amongst the herbage in Normanby Intake Plantation, Eston and Lonsdale.

Cornicularia cuspidata (Bl.) In sphagnum and among rushes on Eston and Easby Moors.

Cornicularia unicornis (Camb.) Pretty generally distributed. Eston Moor, Marton, Nunthorpe, etc. Generally beaten from tufts of grass.

Cornicularia vigilax (Bl.) I am informed by Mr. Falconer that he got this species in Coatham Marsh.

Notioseopus sarcinatus (Sim.) This species is new to Britain and has only been previously reported from Nuremberg, Germany, and the Department of Aisne, France. It seems widely distributed in this locality in wet places on the moors, and is far from uncommon. Considering the remarkable structure of the male, it seems extraordinary that it should hitherto have escaped observation at other points in Britain. Localities:—Eston Moor (1) In the swamp in the middle of the moor; (2) amongst moss on the edge of the stream near the mine. Lonsdale:—Near the Alder wood in sphagnum. Since I first discovered it, Mr. Falconer has taken females at Boosbeck. Females may be taken all the year round, but the males seem to be adult in late October and early November.

Walckenaera acuminata (Bl.) A northern spider, pretty generally distributed in this district. Found amongst dead leaves, etc.

Walckenaera nudipalpis (Westr.) Sparingly in boggy spots on Eston and Easby Moors.

Gonatum rubens (Bl.) A very variable spider, seems equally at home on the highest moors and in the country lanes.

Gonatum rubellum (Bl.) Not common in Lonsdale.

Neriene bituberculata (Wid.) Shaken very commonly from tufts of grass, etc., at Eston and in Lonsdale, Redcar.

Neriere cornuta (Bl.) One female on Eston Moor.

Dismodicus bifrons (Bl.) Very common on whin bushes at Nunthorpe, Gunnergate, Hesleden, &c.

Gongylidium rufipes (Sund.) Not very common amongst crowberry (*Empetrum nigrum*) at Eston and in Lonsdale.

Gongylidium agreste (Bl.) Found sparingly in October on Eston Moor and near the Toll Bar on Marton Road.

Gongylidium fuscum (Bl.) Occasionally turned up in Lonsdale. Not uncommon in Middlesbrough.

Gongylidium retusum (Westr.) Found in fair numbers under stones in Greatham Marsh. It seemed odd to take these and shrimps under the same stone. Also taken in Lonsdale.

Gongylidium tuberosum (Bl.) This was discovered fairly freely in June at Ayton amongst rushes and was not uncommon at Eston in October.

Gongylidium gibbosum (Bl.) Barely separable from the last species, but not uncommon at Eston and in Lonsdale.

Erigone dentipalpis (Wid.) Common on all the moors, and not uncommon near Middlesbrough.

Erigone atra (Bl.) Pretty generally distributed. Not uncommon amongst grass in the Park.

Erigone arctica (White). This species formerly considered so rare that Mr. Walsh's specimen taken among stack refuse at Marton formed the only Yorkshire record, has proved very abundant in all suitable spots. I took it at Grange-town in February, and in very large numbers at Redcar in November. Originally recorded from Spitzbergen.

Maso sundevallii (Westr.) Has been found not uncommonly at Eston, Guisbrough and Lonsdale, and once even in Middlesbrough.

Hilaira uncata (Camb.) This rare species seems of pretty general occurrence among *Sphagnum* on our moors, and has been taken in some numbers on Eston and Easby Moors, and at other points in Lonsdale.

Coryphaeus distinctus (Sim.) I had the pleasure of taking this species at Linthorpe on November 27th. This is the first published Yorkshire record. I only secured one female, but I had no chance of searching further, the weather was so bad.

Coryphaeus reprobus (Camb.) Has occurred on the mud flats at Grangetown.

Tmeticius huthwaitii (Camb.) Not uncommon under stones on the mud flats on both sides of the Tees Mouth.

Macrargus rufus (Wid.) Rather common Normanby Intake Plantation, Eston Moor, Guisbrough, Lonsdale.

Plaesiargus abnormis (Bl.) Common on all the moors. I took one male specimen on Eston Moor with a very curious fungoid growth on the abdomen.

Pedina scopigera (Grube.) Amongst the rushes near the mine on Eston Moor.

Centromerus silvaticus (Bl.) Wilton, Guisbrough, Normanby on the moors, and commonly at sea level at Redcar, also at Linthorpe.

Centromerus expertus (Camb.) Not common on the Wilton side of Eston Moor, but apparently of more general occurrence at the Normanby side.

Centromerus prudens (Camb.) Common enough at Eston and at Redcar, forming one of the few known examples amongst the Arachnids of species, having both a maritime and a sub-alpine distribution.

Centromerus arcanus (Camb.) A rare spider, but not uncommon in Lonsdale.

Centromeria bicolor (Bl.) This species is excessively common everywhere. I once took a female, having six instead of the normal eight eyes. This occurred near the Park.

Centromeria concinna (Thor.) Perhaps only a reduced form of the preceding, which it accompanies everywhere.

Porrhomma pygmaeum (Bl.) Not very common in Guisbrough Park Wood; also taken once near Middlesbrough.

Porrhomma oblongum (Camb.) This spider occurs in Wilton Woods amongst pine needles, but is anything but common.

Porrhomma microphthalmum (Camb.) Another rare spider taken two or three times on Eston Moor.

Porrhomma miserum (Camb.) This seems to be the commonest of the genus in this neighbourhood, and is apparently not uncommon in Lonsdale and on Eston Moor. Shaken from moss at both places.

Sintula diluta (Camb.) A very small spider found amongst the debris in woods—Wilton, Normanby Intake, Guisbrough Park.

Microneta viaria (Bl.) Common at Eston and in Lonsdale, but has occurred sparingly in Middlesbrough.

Microneta subtilis (Camb.) This has occurred two or three times in Lonsdale.

Microneta conigera (Camb.) One female was found in the Pine Wood on Eston Moor.

Microneta rurestris (Koch.) Seems to be fairly common on Eston and Easby Moors.

Microneta gulosa (C.L.K.) This spider recorded for so long as *M. sublimis* (Camb.) has occurred in Lonsdale and also in the Borough, where I secured a fine pair early in November.

Microneta beata (Camb.) A female apparently referable to this species was taken at Hesleden, and one exactly the same on Eston Moor.

(The genus *Microneta* is in a very unsatisfactory condition, and specimens belonging to two or three species not mentioned above have been taken chiefly on the moors, and with many others of the same genus are in the hands of Rev. O. Pickard-Cambridge awaiting identification.)

Bathyphantes nigrinus (Bl.) Very common everywhere.

Bathyphantes gracilis (Bl.) So far this species which is usually very common everywhere has only occurred sparingly and this in the town itself in dead leaves.

Bathyphantes concolor (Wid.) Abundant and generally distributed even in town.

Bathyphantes variegatus (Bl.) Almost as common as the last and in the same localities.

Leptyphantes ericaeus (Bl.) Pretty common everywhere on the moors.

Leptyphantes pallidus (Camb.) This seems to be a rare spider in our district, and has only been taken on whins near Nunthorpe Station.

Leptyphantes obscurus (Bl.) Another spider which is almost absent here but common in other places. I have beaten it from yews near Old Ormesby.

Leptyphantes Mengii (Kulcz.) Common everywhere, from sea level at Grangetown to the highest moors I have visited.

Leptyphantes flavipes (Bl.) A rare spider in the North, but apparently not uncommon in Lonsdale.

Leptyphantes tenuis (Bl.) Common enough under stones etc., on all the moors and also under stones and rubbish on the beach at Redcar.

Leptyphantes tenebricola (Wid.) A fair number were shaken from dead leaves at Linthorpe.

Leptyphantes Blackwallii (Kale). This has the same range as *L. Mengii*, but is even more common. Has been taken in the town.

Leptyphantes cristatus (Menge). Not very common, but has been taken in Wilton Wood and near Middlesbrough.

Leptyphantes minutus (Bl.) I have only taken this spider once, at Normanby.

Leptyphantes nebulosus (Sund.) This very rare spider has occurred in Abingdon Road, Middlesbrough, and under stones on the beach at Redcar. These are the first adults taken so far north in England.

Linyphia clathrata (Sund.) Very common everywhere. I have taken it in hedges near the town from old bird nests.

Linyphia montana (Clerck.) Have beaten this from laurel near Gunnergate.

Linyphia triangularis (Clerck). Seems very sparingly represented in this district. Has only occurred at Eston.

Linyphia peltata (Wid.) Beaten fairly freely from the alders in Lonsdale.

Linyphia insignis (Bl.) Not uncommon in Wilton Wood, and once in dead leaves in Middlesbrough.

Drapetisca socialis (Bl.) Very common in the fallen twigs at the base of the firs in Wilton Wood.

Stemonyphantes lineatus (Linn.) Very common everywhere, generally spun up in dead leaves. Shaken from scraps of paper in the Park and elsewhere in the Borough.

Bolyphantes luteolus (Bl.) Rather common everywhere, but particularly so on the higher moors and on the coast sand-hills at Redcar.

Bolyphantes alticeps (Sund.) Only sparingly found amongst grass in Wilton Wood.

Tapinopa longidens (Wid.) Not uncommon on Eston Moor and in Normanby Intake Plantation.

SUB-FAMILY II.—TETRAGNATHINAE.

Pachygnatha De Geerii (Sund.) This species is very common, but perhaps is most abundant in watery places. Has occurred in every locality from Redcar to the highest moors.

Pachygnatha Clerckii (Sund.) As common generally as the last, but has not been taken freely near the town.

Meta segmentata (Clerck.) Very common everywhere. Most freely beaten from furze in localities where that plant is abundant.

Meta Merianae (Scop.) Very common indeed under the ledges on the gateposts of the Park Gates, and also at other points in the Park and the Borough. Has occurred less freely at Marton and in Kildale.

Nesticus cellulanus (Clerck.) A lover of dark, damp localities; has only been taken under stones near a brook running through a wood at Nunthorpe.

Zilla x-notata (Clerck.) Very common everywhere, even in the Park.

Zilla atrica (Koch.) The same remark applies to this as to the last. I once found one in Abingdon Road.

Epeira diadema (Clerck.) This fine large spider known popularly as the "Garden Spider" is excessively abundant on whins on Eston Hills, and is common enough elsewhere. A slate-coloured form, occasionally replaces the brown type in this district.

Epeira cornuta (Clerck.) Widely distributed in damp places, but is not very common anywhere except at Hesleden. It is generally found spun up in rush heads. At Hesleden it is badly attacked by a small apterous ichneumon, which may be seen ovipositing in the cocoons.

Epeira quadrata (Clerck.) Another fine spider of wide but scanty distribution on the moors.

Epeira umbratica (Clerck.) A large but repulsive looking spider, found abundantly under bark on fences at Ayton and under alder bark in Lonsdale. At Ayton about 50 specimens were observed on one occasion.

ORDER II.—CHERNETIDEA.

FAMILY—CHERNETIDAE.

Obisium muscorum (Leach). Very abundant everywhere on the moors under stones, in sphagnum moss and amongst debris of all descriptions. Found freely enough amongst dead leaves, etc., near Middlesbrough, and at Nunthorpe. Once shaken from seaweed in Greatham Marsh.

ADDENDA.

The following additional species have been captured since the above list was written:—

Xysticus erraticus (Bl.) Taken not uncommonly in the rubbish under whin bushes on Eston Moor.

Oxyptila trux (Bl.) Very common with the above.

Tarentula andrenivora (Bl.) One fine female on Eston Moor running over sandy ground.

Entelecara erythropus (West). Common at the Black Hall Rocks.

Cnephalocotes obscurus (Bl.) One female amongst *sphagnum* on Eston Moor.

Troxochrus hiemalis (Bl.) Very common amongst moss and dead bracken in Wilton Wood.

Dicymbium tibiale (Bl.) One specimen from grass on Eston Moor.

Bathyphantes approximatus (Camb.) One female taken from flood refuse at Leven Bridge.

Linyphia pusilla (Sund.) A male was shaken from a grass tuft overhanging the beck near Nunthorpe Station.

Tarentula pulverulenta (Clk.). Common on all the moors.

Dicymbium nigrum (Bl.). Not uncommon at Eston.

Diplocephalus permixtus (Cb.). Fairly common in Lonsdale.

Hilaira excisa (Cb.). One female at Ayton.

Entelecara acuminata (Cb.), Several females at Hinderwell.

Linyphia hortensis (Sund.). One female at Nunthorpe.

Dictyna latens (Fab.). Very common at Staithes and Runswick Bay.

Meta menardii (Latr.). One male in Lonsdale and a female not far from Ayton Station.

LOCAL MARINE MOLLUSCA.

 BY T. W. SAUNDERS.

The following list of Marine Mollusca has been compiled from specimens collected by me between Redcar and Bridlington during 1908 and 1909. All the shells have been examined by the Rev. F. H. Woods, Bainton Rectory, Driffeld, who is an acknowledged authority on the subject. The nomenclature adopted is that of the Conchological Society's list. The specimens from the Dogger Bank were brought in by a Staithes fishing boat. Specimens marked with an asterisk are additions to the late Rev. J. Hawell's list in the Proceedings, vol. I., page 19.

CHITONIIDÆ.

**Craspedochilus cinereus* (Linn); Redcar, Saltburn, Skinningrove and Runswick Bay; common.

ANOMIIDÆ.

Anomia ehippium (Linn); Redcar, Saltburn, Skinningrove, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

Anomia patelliformis (Linn); Redcar, Saltburn.

**Anomia patelliformis* var. *striata* (Loven); Redcar, Saltburn.

MYTILIDÆ.

Mytilus edulis (Linn); Redcar, Saltburn, Skinningrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

NUCULIDÆ.

**Nucula nucleus* (Linn); Skinningrove.

**Nucula nitida* (G. B. Sowerby); Skinningrove.

LUCINIDÆ.

**Tellimya ferruginosa* (Montague); Skinningrove.

OSTREIDÆ.

Ostrea edulis (Linn); Redcar, Saltburn, Skinningrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

PECTINIDÆ.

Pecten maximus (Linn); Staithes.

Hinnites pusio (Linn); Redcar, Saltburn, Skinningrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

Chlamys varius (Linn); Redcar.

Æquipecten opercularis (Linn); Redcar, Saltburn, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

KELLIPELLIDÆ.

Turtonia minuta (Fab.); Runswick Bay, Redcar, Saltburn, Skinningrove; fairly common.

CYPRINIDÆ.

Cyprina islandica (Linn); Redcar, Saltburn, Runswick Bay, Whitby, Bridlington; common.

SCROBICULARIDÆ.

Syndosmya alba (Wood); Redcar, Saltburn.

Scrobicularia plana (Da Costa); Staithes.

TELLINIDÆ.

Tellina tenuis (Da Costa); Redcar, Saltburn, Skinningrove, Runswick Bay, Robin Hood's Bay, Bridlington; common.

Tellina fabula (Gronovius); Redcar, Saltburn.

Macoma balthica (Linn); Redcar, Saltburn, Skinningrove, Robin Hood's Bay, Bridlington; common.

DONACIDÆ.

Donax vittatus (Da Costa); Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

MACTRIDÆ.

Maetra stultorum (Linn); Redcar, Saltburn, Runswick Bay, Robin Hood's Bay, Bridlington; common.

Maetra stultorum var.; Saltburn.

Spisula solida (Linn); Redcar, Saltburn.

Spisula elliptica (Brown); Saltburn.

Lutraria elliptica (Lamarek); Redcar, Saltburn, Skinninggrove, Whitby.

VENERIDÆ.

**Dosinia lupina* (Linn); Redcar, Saltburn, Staithes.

**Clausinella fasciata* (Da Costa); Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

Tapes virgineus (Linn); Saltburn.

Tapes pullastra (Montague); Redcar, Saltburn, Skinninggrove, Runswick Bay, Bridlington; common.

Tapes pullastra var. *perforans* (Montague); Saltburn.

CARDIIDÆ.

Cardium echinatum (Linn); Saltburn.

**Cardium tuberculatum*.

**Cardium fasciatum* (Montague); Redcar, Saltburn.

Cardium edule (Linn); Redcar, Saltburn, Skinninggrove, Staithes, Whitby, Runswick, Robin Hood's Bay, Bridlington; common.

**Lævicardium norvegicum* (Spengler); Staithes.

GARIIDÆ.

Gari ferroensis (Chemnitz); Redcar, Saltburn.

MYIDÆ.

Mya truncata (Linn); Redcar, Saltburn, Skinningrove, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

SOLENIIDÆ.

Ensis ensis (Linn); Redcar, Saltburn.

Ensis siliqua (Linn); Redcar, Saltburn.

SAXICAVIDÆ.

Saxicava rugosa (Linn); Redcar, Saltburn, Skinningrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

PHOLADIDÆ.

Barnea candida (Linn); Redcar, Saltburn.

DENTALIIDÆ.

Dentalium entalis (Linn); Redcar, Saltburn.

PATELLIDÆ.

Patella vulgata (Linn); Redcar, Saltburn, Skinningrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington; common.

**Patella depressa* (Pennant); Staithes.

Helcion pellucida (Linn); Redcar, Saltburn, Skinningrove, Runswick; common.

Helcion pellucida var. *lævis* (Pennant); Redcar, Saltburn, Skinningrove, Runswick Bay.

ACMÆIDÆ.

Acmæa testudinalis (Muller); Redcar, Saltburn, Skinningrove, Runswick Bay.

Acmæa virginea (Muller); Saltburn.

TROCHIDÆ.

Eumargarita helcina (Fab.) ; Redcar, Saltburn, Staithes.

Gibbula cineraria (Linn) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

**Gibbula cineraria* var. *electissima* (Bean) ; Saltburn.

**Eumargarita grænlandica* (Chemnitz) ; Skinninggrove.

Calliostoma zizyphinus (Linn) ; Redcar, Saltburn, Staithes.

LITTORINIDÆ.

**Lacuna crassior* (Montague) ; Saltburn.

Lacuna divaricata (Fab.) ; Redcar, Saltburn, Skinninggrove, Runswick.

**Lacuna parva* (Da Costa) ; Saltburn.

Lacuna pallidula (Da Costa) ; Redcar, Saltburn.

Littorina obtusata (Linn) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

**Littorina obtusata* var. *æstuarii* (Jeffreys) ; Redcar, Saltburn, Skinninggrove.

Littorina rudis (Maton) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick, Whitby, Robin Hood's Bay, Bridlington ; common.

Littorina rudis var. *saxatilis* (Johnson) ; Saltburn.

Littorina littorea (Linne) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington.

RISSOIDÆ.

Rissoia parva (Da Costa) ; Redcar, Saltburn, Runswick ; common.

Rissoia parva var. *interrupta* (Adams) ; Redcar, Saltburn, Runswick ; common.

Alvania punctura (Montague) ; Redcar, Saltburn, Runswick ; common.

**Manzonina costata* (F. Adams) ; Saltburn.

Anoba striata (J. Adams) ; Redcar, Saltburn, Skinninggrove.

Cingula semistriata (Montague) ; Redcar, Saltburn, Skinninggrove ; common.

**Cingula trifasciata* (T. Adams) ; Redcar.

SKENEIIDÆ.

Skenia planorbis (Fab.) ; Redcar, Saltburn, Skinninggrove.

CAPULIDÆ.

Capulus hungaricus (Linn) ; Redcar, Saltburn.

CYPRÆIDÆ.

Trivia europæa (Montague) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

NATICIDÆ.

Lunatia pallida ; Saltburn.

**Lunatia catena* (Da Costa) ; Redcar, Saltburn, Skinninggrove, Staithes ; common.

**Lunatia Alderi* (Forbes) ; Redcar, Saltburn, Skinninggrove, Bridlington ; common.

CERITHIIDÆ.

Bittium reticulatum (Da Costa) ; Saltburn.

PYRAMIDELLIDÆ.

**Spiralinella spiralis* (Montague) ; Redcar.

TURRITELLIDÆ.

Turritella communis (Lamarck) ; Redcar, Saltburn.

APORRHAIIDÆ.

Aporrhais pes-pelecani (Linn) ; Redcar, Staithes.

BUCCINIIDÆ.

Buccinum undatum (Linn) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

Neptunea antiqua (Linn) ; Redcar, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

Volutopsis norvegicus (Chemnitz) ; Dogger Bank.

Beringuis turtoni (Bean) ; Dogger Bank.

Tritonofusus gracilis (Da Costa) ; Redcar, Skinninggrove, Staithes, Whitby, Bridlington.

**Donovania minima* (Montague) ; Skinninggrove.

MURICIDÆ.

Ocenebra erinacea (Linn) ; Bridlington.

**Trophon clathratus* (Linn) ; Saltburn.

Purpura lapillus (Linn) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

NASSIDÆ.

**Nassa reticulata* (Linne) ; Redcar, Saltburn, Skinninggrove, Staithes, Runswick Bay, Whitby, Robin Hood's Bay, Bridlington ; common.

PLEUROTOMIDÆ.

**Bela turricula* (Montague) ; Redcar, Saltburn, Skinninggrove.

Bela rufa (Montague) ; Redcar, Saltburn, Skinningrove.

**Bela trevelyana* (Turton) ; Skinningrove.

**Clathurella linearis* (Montague) ; Redcar, Saltburn, Skinningrove.

Mangelia costata (Donovan) ; Skinningrove.

TORNATINIDÆ.

**Tornatina truncatula* (Brug.) ; Redcar, Saltburn.

**Tornatina obtusa* (Montague) ; Redcar.

**Diaphana hyalina* (Turton) ; Saltburn.

**Diaphana expansa* (Jeffreys) ; Skinningrove.

PHILINIDÆ.

**Philine catena* (Montague) ; Skinningrove.

LAMELLARÜDÆ.

**Velutina lævegata* (Pennant) ; Skinningrove.

SECRETARY'S REPORT FOR 1908-9.

In presenting my First Annual Report, I have pleasure in stating that the past season has been a very successful one. The Summer and Winter Meetings have been as well attended as we have known them to be, and the work done by the Members of the different Sections has been of a most valuable character.

SUMMER MEETINGS.—Eight Meetings were held during the summer, and, with two exceptions—those at Middleton-in-Teesdale and at Swainby—the weather conditions were fairly favourable. The excursions were held at the following places:—Hutton Rudby, Boulby, Middleton-in-Teesdale, Roxby, Swainby, Ralph Cross and Westerdale, the Falling Foss, and Castleton; the average attendance being 19 to 20. At the Middleton and Swainby Meetings, heavy rain prevented any outdoor work; this was very disappointing, since a large number of Members attended both excursions.

I have to acknowledge the great assistance I have received from the following Members in making arrangements:—Messrs. T. J. Cozens, H. Frankland, Rev. J. C. Fowler, T. W. Saunders, and J. W. R. Punch. At the Hutton Rudby excursion, Messrs. Alexander Park and Wilson gave the Members the benefit of their local archæological knowledge.

An outcome of the Middleton-in-Teesdale Meeting, when the Club met the Members of the Durham County Naturalists' Society, was an invitation for the Members of the Darlington Naturalists' Field Club to join our Society in the Swainby excursion. Bad weather spoiled this Meeting which would otherwise have been a most successful one. The Rev. J. C. Fowler kindly entertained the Members of both Societies to tea.

Our Members also enjoyed the hospitably of Mr. and Mrs. C. Hood at the Westerdale Meeting, and of Mr. and Mrs. J. W. R. Punch at the Castleton Meeting, and the thanks of the Club are due to them for their kindness.

A few Members attended the Y.N.U. Meeting at Osmotherley, on August Bank Holiday. When I say Osmotherley, I mean Northallerton, for though ostensibly held at the former village, it was really held at Northallerton. This was not without its compensations, the most pleasurable part of the Meeting being undoubtedly the long drives from the town to the foot of the hills and back again.

The Club are indebted to Mr. T. C. Hutchinson, of Saltburn, for permission to visit the Boulby Alum Quarries.

WINTER MEETINGS.—Eleven of these have been held, but, with one or two exceptions, the attendance thereat has been very moderate. When it is borne in mind that the lecturers put themselves to no little inconvenience and trouble in preparing their lectures, it is somewhat discouraging to have to record such meagre attendances.

The Exhibition Meeting arranged for October 17th was, for some unaccountable reason, a complete failure, only seven Members attending and no exhibits being sent in, although Mr. Henry Simpson had been good enough to arrange microscopes and to have one or two special objects for inspection. Usually, these exhibition meetings are very successful.

General lectures, not dealing with any branch of science were given on "Richard Jeffries," by the Rev. George Lane; and a Y.N.U. lantern lecture by Mr. Godfrey Bingley, of Leeds, entitled: "From Cornwall to Shrewsbury." Mr. G. B. Walsh also gave us a physical lecture on "Rest and Motion."

Our thanks are due to the lecturers for giving their papers, to the Literary and Philosophical Society for the use of their rooms, and to the authorities of the Dorman Memorial Museum for allowing two meetings to be held there.

We are indebted to Mr. Simpson for reports of our meetings in the local press, and to the editors of the "Star," "Echo" and "Gazette" for inserting same.

WORK OF THE SECTIONS.—This, on the whole, has been of a most valuable and interesting character, and in reporting upon it, I have included the work done at the Summer Meetings, and the different kinds of Lectures we have had during the winter. My thanks are due to the Sectional Secretaries and Members for notes, enabling me to make this report.

ARCHÆOLOGICAL SECTION.—In reporting upon the work of this Section, the Secretary, Mr. Fallow, says that he has been unable to do any local research during the past year, most of his time having been spent at the Record Office.

At the Hutton Ruddy Excursion, the Archæological features of the Church were kindly explained by Messrs. Alex. Park and Wilson. North of the Church, and parted from it by a distinct moat, a rectangular mound of considerable dimensions was pointed out. It was formerly the moot hill, round which the public assembled for the transaction of business.

On the occasion of the Boulby Meeting, Easington Old Church was examined, and the Club are indebted to Mr. Stubbs for pointing out various objects of interest, and the site of ancient earthworks, etc.

At the Roxby Meeting, St. Nicholas' Chapel of Ease was studied. It contains one of the finest monumental brasses in the district, dating back to 1523.

At the Swainby Meeting, the Rev. J. C. Fowler kindly explained the Archæological features of Whorlton Church and Castle.

BOTANICAL SECTION.—Mr. Cozens reports for the Botanical Section as follows:—

I have been asked to contribute a few notes regarding the work of the Botanical Section during the past year. To my mind, the excursions were admirably planned, so that a good many parts of the immense area of the Cleveland district were investigated in turn, purely rural districts, alternating with sea-side localities, and these again, with the moors and more isolated spots which the various Sections had never, or very little, specially studied. To two of these latter places I regret bad weather kept me from going.

As in the previous year, a great departure from the ordinary scheme of summer meetings was introduced, a visit being arranged to some spot outside the Cleveland area, and this excursion, as in last year, drew forth the best muster of the season. I refer to Middleton-in-Teesdale. Unfortunately, the weather marred what I am sure would otherwise have proved a most enjoyable meeting.

The first excursion was fixed for that delightful spot, Hutton Rudby, on May 9th, but the season was not sufficiently advanced to meet with a great variety of plants, nothing specially being noticed, although had we been able to go through Skutterskelf Woods, *Aconitum napellus* might have been seen. Near the same spot by the Leven side there is a remarkable growth of *Conium maculatum*, the plants sometimes reaching 5 to 6 feet in height.

The Meeting, however, which had been looked forward to with considerable expectancy was that fixed for Teesdale on June 13th. The writer had communicated with friends in Middleton, who were lovers of plant life, and obtained a promise that they would, if possible, procure some of the gems of that unique district. Mrs. Ford, the wife of the Rector, and Miss Dent, a keen botanist, troubled themselves in this matter, and it was indeed fortunate for us they did so, for their endeavours were of great assistance, the rain commencing to descend immediately we left the train, and continued persistently until we took our departure, thus shattering all our good intentions—but it was not all disappointment. There were several varieties of plants awaiting us, notably *Gentiana verna*, *Bartsia alpina*, *Geranium rotundifolium*, *Galium boreale*, *Primula farinosa*, and *Trollius Europaeus*.

Some of the members who feared not the inclement weather made a little excursion by the Skear's Beck, where the *Astrantia major*, one of the rarest of our plants, was pointed out, with *Saxifraga umbrosa*, and *Lymachia nummularia* in close proximity. The *Botrychium lunaria* was found, and several species of the liverworts were also noticeable, as were a great variety of mosses and lichens.

At the High Force, other naturalists from Durham County exchanged courtesies, and we were able to examine several species which they had gathered earlier in the day before the rain stopped investigations. Amongst those inspected were *Viola lutea* and *Potentilla fruticosa*.

The excursion fixed for July 11th, at Swainby, was a duplication of the one at Middleton—Jupiter Pluvius intervening, and by ubiquity spoiling it. Remarkable features noticed on the tramp from the Station to Swainby were the immense quantities of *Agrimonia eupatoria* on each side of the road, the *Bryonia dioica* on the hedges, and the luxuriance of the *Lonicera periclymenium*, which in one spot on the slope of Whorl Hill grew so densely that at some distance away the hedge presented a patch of crimson and gold. This phenomenon was only noticeable in this district, and the writer wonders whether the geological formation had anything to do with it. This leads me to suggest the wisdom of mapping out the various localities according to their soil and keeping a record of the plant life of each particular soil. For instance, round Stokesley there are distinct lines of separation between the various formations—the Trias (Red and Green Marls and Gypsum), the Lower Lias (Shales) Alluvium, Rhaetic bed outcrop, and the Whin Dyke, and I have noticed a considerable diversity of growth.

I was prevented from attending the meeting at Sleights for the Falling Foss, therefore my knowledge of what took place is limited, but from my experience of the Falls in Teesdale, I should imagine the growths of the *Cryptogams*, or so-called flowerless plants on the wet rocks would be plentiful and worthy of investigation.

The last meeting of the season at Castleton, on September 5th, produced a fairly good muster, but the weather again somewhat marred the enjoyment. The Quarry by the Station proved interesting, the *Cheiranthus cheiri* and *Matricaria parthenium* thriving in the interstices of the rocks. The walk across the moor produced nothing of interest, except the abundance of *Calluna vulgaris* (*alba*) *Drosera rotundifolia* and *Empetrum nigrum*, as it proved to be the period when vegetation is on the wane.

With regard to my own individual work round this district, I cannot chronicle anything fresh, except *Scutellaris galericulata* at Turkey Nab; *Alchemilla alpina* (evidently been brought into the place), *Claytonia perfoliata*, *Aconitum napellus*, and *Helleborus viridis* at Ingleby; *Daphne laureola* and *Ononis spinosa* at Tanton. I have been told that *Gagea lutea* is to be found in one of Mr. Wynne-Finches' plantations close to Stokesley, and I hope to make sure of the record shortly.

T. J. COZENS.

During the year, Dr. Smith, of Leeds, and the Hon. Sec. made a botanical survey of the South Cleveland Moors at Easter, and of the Hambleton Moorlands in August, on the occasion of the Y.N.U. Meeting. Some of the results of these surveys were given in the Hon. Sec.'s lectures on "Moorland Types" and "The Cleveland Moors," but full details will appear in Dr. Smith's botanical maps of Cleveland, which will be issued shortly.

Mr. H. G. Scruton, B.Sc., lectured on March 6th on the "Function and Structure of the Leaf," and a discussion followed on the adaptations of the leaves of ericetal plants.

CONCHOLOGICAL SECTION.—Mr. T. W. Saunders reports for this Section, and states that between Whitby and the Mouth of the Tees he obtained about 60 species of marine shells, one of them being a very good specimen of the Sunset Shell (*Psammobia ferroensis*) from Saltburn. From sea coal he has also obtained multitudes of small shells, which have still to be determined. 300 of these minute shells will lie on a threepenny piece.

Mr. Saunders records 39 species of Land and Freshwater Mollusca, including that rare northern slug, *Limax tenellus*, taken at Osmotherley at the Y.N.U. Meeting. It was identified by Mr. Denison Roebuck, and constitutes a new record for the Cleveland area. Mr. Saunders was also fortunate enough to find two examples of *Achatina acicula* at Hutton Rudby. The only other record for this species in the district is that of Dixon and Watson, who found it in flood refuse near the River Tees at Middlesbrough. Its occurrence at Hutton Rudby proves that it is an inhabitant of our area.

ENTOMOLOGICAL SECTION.—This Section has been very active as usual. Mr. Lofthouse, the Secretary, reports on the *Lepidoptera* as follows:—

The past season, so far as my experience goes, has been very little different from the two preceding years; for certain reasons, I was unable to do anything in Entomology until the end of May, and much less than usual during the summer months. April, May and June were, on the whole, very cold, and so far as my experience goes, insects were very little in evidence. From July into the autumn, moths came to “sugar” much more freely than has been the case during the same period in recent years, but the species were of the commonest. The “Yellow Underwing” (*T. pronuba*) being more than usually abundant. On an evening towards the end of June, one of the “Swifts” (*Hepialus hectus*) was noticeably abundant flying about over the Bracken near Battersby, from 8 to 8-30 p.m., some of the specimens were very well marked, and one or two interesting forms were noticed. In November, the Death’s Head Moth occurred at Redcar.

So far as I know, no additional species in the “Macros” has been added to the local list during the past year, but in the *Tortrices* I have at least six additional species, and about the same number of *Tineæ*.

It may be interesting to note here the number of species of *Lepidoptera* that have been recorded in our Proceedings, or that I know as having been taken in the Cleveland district up to the present time, viz. :—

Butterflies	23 species.
Hawk Moths, Bombyces and Notodonti	47 „
Noctuæ	156 „
Geometers	125 „
Other Orders to end of <i>Tortrices</i>	132 „
<i>Tineæ</i>	90 „
	—
Total	573 „

In addition to above, between 30 and 40 additional species are recorded in the Yorkshire List for the Cleveland district, mostly by the late Jno. Sang, of Darlington.

I should say it will be possible to add from 250 to 300 species to the above number for the district, mostly *Tortrices* and *Tineæ*.

T. A. LOFTHOUSE.

Mr. Lawson Thompson reports that he was unable to do any work amongst local beetles last year, most of his investigations having been carried on in other districts of Yorkshire.

At the Y.N.U., Osmotherley Meeting, the Hon. Sec. read a paper on "The Problems of the Fauna of North-East Yorkshire," in which the history of various local insects was dealt with.

Under this Section may also come the following report on the spiders of Cleveland from Mr. G. B. Walsh:—

Some preliminary work has been done on the Spiders of the district, and already thirteen species have been added to the North Riding list, of which one is new to Yorkshire, and in the case of two others, there is only one previous record. One, *Pseudo-Scorpion*, has been added to the local list.

G. B. WALSH.

It is gratifying to report that some work is being done on the "neglected group" of animals for which this district affords a splendid field of work.

Mr. Walsh's lecture on "Parasites," held on February 27th, dealt very largely with insects, and several of the more conspicuous local insect parasites were on exhibition.

GEOLOGICAL SECTION.—I have pleasure in stating that this Section has also been doing valuable work in the district during the past season, and its Secretary, Mr. J. J. Burton, reports thereon as follows:—

During the past Session, the field work of the Geological Section has been interesting, but somewhat restricted, as the excursions have been planned to give all Sections of the Society an opportunity of making investigations and records rather than to give special opportunities to any particular Section. One of the most interesting days of field work

was on the occasion of the visit to Boulby, where, under the leadership of Mr. T.W. Saunders, the huge quarries of Alum Shale were visited, and its characteristic fossils obtained in abundance. The occasion was made memorable by not only a visit to the vast remains of the old Alum Works, consisting of kilns, boiling and evaporating vats, etc., but by having the opportunity of examining the last sample crystals made at the works, which had, by a fortunate accident, been preserved amongst a quantity of untreasured remains. Here, the dogger underlying the estuarine-series of the inferior oolite was examined, and on this and other occasions, the broken-up and worn fossiliferous contents were noted and it is hoped on identification that much light will be shed on the obscure problem of the condition and nature of the pre-existing strata from which this formation was derived. At the Alum Quarries, the dogger is of a very ferruginous nature, and is about four feet in thickness, but is variable in this respect and also in its lithological character. The enormous thickness of the Alum Shale (*zone of ammonites communis*) is well shewn in the workings of these old abandoned quarries.

The Geological Section had also an opportunity on the subsequent visit to Roxby of identifying the dogger outcrop on the opposite side of the valley, and of noting its general position corresponding to the cliff exposures. On this occasion, too, were noted some very fine examples of current bedding in the exposures in a sandstone quarry, and photographs were taken of them.

The visit to Hutton Rudby, under the guidance of the Rev. J. C. Fowler, gave the members an opportunity of noting the Rhætics in the Leven, where there were some fine exposures with layers and pockets of veined and clear gypsum intercalated in the strata. Not far away in a bore-hole at East Harsley, the same strata appears to have been cut through, but the contractor having charge of the boring operations, not being a geologist, did not carefully preserve the material from the boring, but an uncertain twelve feet seems to be in the position where one might expect the Rhætics to occur. As a source of water supply, the boring was unfortunately a failure, but it will be of interest to preserve a record of the strata passed through, and this will be obtained.

Again, under the guidance of the Rev. J. C. Fowler, the members visited Whorlton and found much food for discussion as to the condition under which Whorl Hill became cut off from the main moorland.

Some of your members had an opportunity of visiting Richmond on the invitation of the Yorkshire Geological Society, and of a close inspection of the remarkable glaciated surfaces of the limestone in Barton and Forcett Quarries, and also of inspecting on the spot the physical features which have led some authorities to the conclusion that the Tees in ancient times flowed down Gilling Valley into the Swale. The opinion generally come to on this occasion was that it was possible, but that the arguments in favour were not strong enough to accept the theory as demonstrated, and that the arguments against were very difficult to meet. On a later occasion, by the kindness of the same Society, the Geological Members were invited to the excursion to Saltburn and Whitby. Under the leadership of Professor Kendall, the coast from Whitby to Saltwick was examined, and further investigation of the dogger was made. On the following day the plant bed at Marske was, by the permission of the land owner, very carefully explored. The writer engaged two competent miners, and by the aid of drills and picks and crowbars and a few shots, a large quantity of rock was dislodged and new exposures made, with the result that on this and on subsequent visits by Members of our own Society, a large number of new varieties to the district were obtained. These have since been identified, and a record made of them. About 40 different varieties were obtained.

The excursions to Castleton and Iburndale provided good work for Geological study.

The general result of last season's Field Work may be considered to have been very satisfactory. Much detail work has been done by Mr. Elgee, and some of this has been given to the members during the winter session. The members may be congratulated upon having found the man who has the true field spirit in him with the opportunity of indulging in it, and their thanks are due to him for his generous desire to give the members the benefit of his

original researches. He has carried out Professor Lamplough's ideal, where he recommends to all the cultivation of the amateur spirit in scientific enquiry.

As a result of the visits to Richmond and Marske, the Middlesbrough Dorman Museum will have its Geological cases enriched.

J. J. BURTON.

It should be added that Messrs. Lane and Saunders have published the results of their researches at the Marske Quarry in a paper in the "Naturalist" for March, 1909, entitled "Fossil Plants from the Marske Quarry." They have in this investigation made frequent use of the Hawell Bequest at the Dorman Museum, and Professor Seward, of Cambridge, has kindly assisted in the identification of doubtful species.

At the Saltburn Meeting of the Y.G.S., Mr. F. Elgee read a short paper on the "Glaciation of North Cleveland," which has since been published in their Proceedings.

Only one Geological lecture was given during the winter, viz. :—that of Mr. J. W. Patterson, of West Hartlepool Technical College, on the "Elements of Micro-Petrography," illustrated by beautifully coloured lantern slides taken on Lumiere Plates.

VERTEBRATE SECTION.—Two Zoological lectures were given during the Winter. At the Dorman Museum, Sir Alfred Pease explained the habits and haunts of the African, Indian and other Mammals in his unique collection, in a most entertaining and interesting manner.

Mr. Arthur Whitaker, of Barnsley, gave a Y.N.U. Lantern Lecture on the "Habits of Bats," on which subject he is an authority. It would be an interesting branch of research for some of our members to take up, seeing that practically nothing is known of the Bats of the Cleveland district.

Mr. A. Beckwith reports that he has done a good deal of work amongst the birds at Teesmouth South, and has furnished notes dealing with the arrival of autumn migrants.

A Dormouse was found in Girrick Woods in January, a new record for the Cleveland district.

MEMBERSHIP.—This stands at 110, an increase of one over last year. During the year 7 members resigned, and the following eight new members were elected:—Messrs. C. H. Goodwin, J. R. Ritson, J. G. Smiddy, T. Smith, J. E. Stead, H. Waddington and Miss E. Clapham.

PROCEEDINGS.—These are now in the printers' hands, and I hope to issue them to members during the coming month.

YORKSHIRE NATURALISTS' UNION.—Seeing that it is now nearly ten years since the Y.N.U. held an Annual Meeting at Middlesbrough, I would suggest that an invitation be sent to them to hold their Annual Meeting at Middlesbrough in 1910.

GENERAL.—To encourage a more active local interest in our Society, I think it would be a good plan if any of our members could arrange to give lectures in Middlesbrough and district on Geology, Natural History, &c., to the general public. I feel sure that they would arouse interest in the work of the Society, lead to an increase of membership, increase the sale of our Proceedings, and lead to further investigation being done in Cleveland. I for one should be pleased to lead the way in such an undertaking.

It is also gratifying to state that our members are beginning to make use of the collections in the Museum, and have in their turn presented specimens to the Museum Collections.

FRANK ELGEE,

HON. SEC.

SECRETARY'S REPORT FOR 1909.

I have pleasure in presenting my Second Annual Report upon the work accomplished by our Society during the past season. Taken as a whole, the work of the Club in 1909 has been up to, if not beyond, the standard of previous years, but active investigations were seriously interfered with by the wet and cold weather.

SUMMER MEETINGS.—Eight excursions were arranged for the summer, but only six of these were held. The Middleton-in-Teesdale Excursion, arranged for June 26th, had to be abandoned owing to excessive rain, whilst the Ayton Meeting, arranged for July 24th, was not held, owing to various unavoidable alterations in the dates of the July Meetings.

Fine weather attended all six Meetings, the average number of Members present being, however, somewhat small considering the interesting nature of the localities visited. The most successful excursion was that to the Marske Quarry, on May 8th, with an attendance of between 30 and 40. Messrs. Lane and Saunders kindly acted as guides, the latter gentleman superintending the blasting operations.

Mr. T. J. Cozens kindly acted as guide at the Cold Moor Excursion, on May 22nd, whilst at the Runswick Bay Meeting of the Y.N.U., in July, Mr. J. J. Burton guided the geological party. At the Goathland Meeting, in September, Messrs. Frankland and Punch led the Members over very interesting ground. Our thanks are due to these gentlemen for their kind offices, as well as to Mr. Senior, of the Zetland Estate, for permission to visit and blast Marske Quarry, to Mr. J. L. Dugdale for permission to visit the woods at Crathorne, and to Sir Francis Ley, for permission to visit his rock garden at Crunkley Gill, and for placing one of his gardeners at our disposal to act as guide.

A few of our Members attended the Y.N.U. Meeting at Runswick Bay in July.

WINTER MEETINGS.—Eight Winter Meetings have been held, but, with one or two exceptions, the attendance at these has been lamentably small, but this has been compensated for by their quality. The members who contributed to the Meetings having, more or less, dealt with their own investigations. This, I take to be the chief object of our winter meetings, viz. :—to expound and read papers on our own work. It is so easy to degenerate into a mere magic lantern entertaining society, that it is refreshing to have to report to the contrary.

Our best thanks are due to the lecturers for their papers, and to all who have in any way contributed to the success of the exhibition meetings.

A suggestion made by Mr. Frankland that the different Sections should assist in having exhibition meetings, has only partially been carried out. Still a start has been made with this, which may be the seed of future development.

I would venture to suggest for your consideration that we limit our summer and winter meetings to one per month. The small attendance at many of the meetings seems to demand this. In this way we would hold 12 meetings per annum, 5 summer and 7 winter meetings, exclusive of the Annual. With regard to the Field Meetings, we have now visited most parts of Cleveland, and to prevent too much repetition, a limitation of the number of excursions seems desirable. Fuller arrangements, too, could be made for these meetings, and they might, in many instances, be extended to the whole day.

Our thanks are due to Mr. Simpson for kindly reporting our meetings in the "Gazette," "Star" and "Northern Echo."

WORK OF THE SECTIONS.—I have included here the work done at the Summer Meetings and the nature of our Winter Meetings.

ARCHÆOLOGICAL SECTION.—There is little to report in this Department. The Rev. J. C. Fowler discovered some fragments of Roman Pottery at Whorlton, which were on view at the Exhibition Meeting on March 5th.

At the Crathorne Meeting, Members were enabled to examine, under the guidance of the Vicar, the 14th Century Church there.

On February 12th, our President gave a most interesting and original address "On Details of Norman Architecture," illustrated with special lantern slides.

BOTANICAL SECTION.—Little work appears to have been done by this Section. During the year I paid special attention to moorland plant communities, the results of which I had the honour to lay before you in a lantern lecture on "Moorland Research in 1909," on November 6th. Some details of moorland plant life also appeared in the "Naturalist" for January and February, under the title of "Vegetation of Swiddens in N.E. Yorkshire."

In July, and again in September, Dr. W. G. Smith, of Edinburgh, and myself botanically surveyed part of the South Cleveland Moors and Mulgrave Woods, and the shore vegetation at Runswick Bay.

Dr. Smith's botanical map of the district is rapidly nearing completion, and will probably be issued this year. It will form a valuable contribution to local plant geography. One fact has come out very clearly, that the English Maple is a very characteristic tree in some woods near the sea and also inland. The lowland woods are dominated by oak and ash, the upland woods by oak and birch.

CONCHOLOGICAL SECTION.—Mr. T. W. Saunders reports on this as per his notes in this part of Proceedings.

Mr. Saunders also had a choice collection of rare marine shells on exhibition on March 5th.

ENTOMOLOGICAL SECTION.—The usual work has been done in this Department by Messrs. Lofthouse, Thompson, Walsh and Sachse.

To Mr. Walsh we are also indebted for an interesting lecture on "Insect Myths and Superstitions," on December 4th.

GEOLOGICAL SECTION.—A successful exhibition meeting of this Section was held at the Museum on October 9th, and a full report of the season's work presented by the Secretary, Mr. J. J. Burton. On March 19th, the Rev. G. J. Lane delivered a most instructive and original address on "The Jurassic Flora."

Mr. Burton's report is as follows :—

REPORT OF THE GEOLOGICAL SECTION.

Presented at Meeting, held on October 9th, 1909.

The past Session has been one of considerable disappointment, as the weather generally has been so bad that outdoor investigation could only be pursued under physical discomfort, but members of this Section have done good work in between meetings when opportunity offered, and I must mention in particular the work done by the Rev. G. L. Lane and Mr. T. W. Saunders in investigating the fossil flora of Marske and Upleatham Quarries, also the plant beds at Whitby and Castleton. Some of the results of their investigations have been published in the "Naturalist." The most noteworthy records as supplied to me by Mr. Lane are as under :—

- | | | | |
|----|-------------------------------|---------|---|
| 1. | Zamites Sp. | Marske. | New, not recorded in Seward's catalogue. |
| 2. | Taxites zamiodes. | Marske. | New record for Cleveland. |
| 3. | Nilsonia tenuicatus. | Marske. | Do. |
| 4. | " schauburgensis. | Marske. | Do. |
| | | | A wealden species. |
| 5. | Todites williamsonia. | Marske | New record for Marske. |
| 6. | Zamites buchianus. | Marske. | New record for Cleveland. |
| | | | A wealden species. |
| 7. | Pterophyllum Sp. | Marske. | New record for Cleveland. Not catalogued by Seward. |
| 8. | Cladophlebis lobifolia. | Marske. | New record for |
| 9. | Coniopteris hymenophylloides. | Marske. | Marske. |



Nilssonia Schaumburgensis (Dunk.), Marske Quarry.

Hitherto only recorded from the Wealden.

Specimen identified by Professor Nathorst.



Cladophlebis haiburnensis, L. and H., Marske Quarry.

Only two specimens of this species have been recorded from Yorkshire.



10.	<i>Williamsonia gigas</i>	Whitby.
11.	<i>Cladophlebis denticulata</i>	”
12.	<i>Williamsonia pecten</i>	”
13.	<i>Taeniopteris major</i>	”
14.	” <i>minor</i>	”

It is a signal honor to our Field Club, through Mr. Lane that the publication of his short paper in the “Naturalist” caused Professor Lamplough to ask me to put Mr. A. Newall Arber, M.A., of Cambridge University, in communication with him, but perhaps the greatest honour the Club, and also Mr. Lane personally, have received, was a visit from Professor Nathorst, of Stockholm, who is reputed the greatest authority on Paleobotany on the continent. After an inspection of Mr. Lane’s collection, he congratulated him on his success.

At the Meeting at Marske Quarry, the attention of the members was drawn by Mr. Saunders to a very interesting example of a wash-out, where the seam of ironstone had been almost denuded by some ancient stream, and the gully thus formed filled in with boulder clay. Cases of this sort in a mine are not unknown in mining operations, and when they occur they cause much trouble. Mr. Saunders is sending to the meeting a section of Faulting at Boulby Mine, a section of the main seam of Cleveland ironstone shewing the pecten bed and the two-foot seam at Brotton, also a section of the coast between Redcar and Ravenscar.

There was a very interesting meeting at Runswick Bay when the coast section and the Kettleless Alum Quarries were investigated. Perhaps the most interesting part of the excursion was an examination of the streams which flow into the Bay over the boulder clay which has filled up the old river valley. The beds of the streams are composed almost entirely of erratics which have been washed out of the clay. Here we found many big blocks of basalt from the Whin Sill, much Teesdale limestone, many granites from the Cheviots, and boulders of Shap granite of all sizes. One boulder from Shap would weigh about three tons.

At Goathland there was an interesting meeting, but not much time for investigation, and the Geologists would do well to have a field day to themselves in this district, as the glacial and solid geology will well repay study; and we are there getting close to oolitic exposures which do not exist in our immediate neighbourhood.

One interesting observation only indirectly connected with Geology was made at Beck Hole, viz. :—the presence of a considerable slag tip and the “ old bear ” of two small blast furnaces. These furnaces appear to have been erected by the Whitby Iron Co., Limited, in 1859, but into blast in 1860, but when blown out and dismantled I have not yet been able to ascertain, but hope to do so for the purposes of a record. The stone used was the dogger or top bed as it is variously named.

J. J. BURTON.

VERTEBRATE SECTION.—I have no report for the Vertebrate Section, but we are indebted to Mr. A. L. Kershaw for a Lecture on “ Birds,” on February 19th.

MICROSCOPY SECTION.—A successful exhibition meeting under the auspices of the Microscopy Section was held in March, and the other Sections also contributed to the success of the meeting.

MEMBERSHIP.—Our membership now stands at 112. During the year 8 new members were elected and 4 resigned. We appear to have reached the maximum number of members, since for some years past the number has remained very nearly the same, 110-120.

Y.N.U. ANNUAL MEETING.—As you are aware, the Y.N.U. accepted our invitation to hold their Annual Meeting at Middlesbrough, on December 17th, 1910, and although it seems somewhat early to mention arrangements for that date, I would suggest that a small Committee be formed to deal with the matter.

PROCEEDINGS.—Another part of Proceedings was issued during the year a few copies of which have been sold.

Papers for another part have been gathered together.

In conclusion, I would like to thank all those members who have assisted me in my work. I am specially indebted to our President and to the Hon. Treasurer for valuable suggestions and help during the past year.

FRANK ELGEE,

HON. SEC.



PROCEEDINGS
OF THE
CLEVELAND NATURALISTS
FIELD CLUB.

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1903-1909.

Edited by the Rev. J. Cowley Fowler, B.A. F.G.S.

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INTRODUCTORY REMARKS.

The completion of the second volume of the Transactions is an interesting event. We hope this record will be succeeded by many more volumes of like kind as time goes on. The contents are varied, of more than local interest, and touch upon the Flora of the Jurassic age, Entomology, Archæology, Botany, and other branches of Science.

The love of nature in all its aspects is certainly spreading abroad, and is a cheering sign of the times: the widening of scientific culture amongst all classes must, at all events, make life fuller and richer, and certainly happier. The pursuit of science is a bright spot in many a hard-worker's life, and he often follows his heart's hobby with more energy than his daily work: it is to him an inspiration, a joy deeper than words can express, or perhaps his friends understand; a delight of the highest order.

To nature then we go with all her treasures which she never withholds from the diligent student.

Beautiful Cleveland satisfies the members of the Club, so far, and seldom do we wander to some "Terra aliena," although sometimes we do make an excursion beyond its bounds.

There is surely plenty to employ the keenest observer between a live beetle and an extinct mammoth, and between "The Cedar of Lebanon and the hyssop that groweth on the wall."

J. C. FOWLER.

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Yorkshire Naturalists' Union Transactions, parts 15.

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Crossland & Masee's “Fungus Flora of Yorkshire.”

Weardale Naturalists' Field Club Transactions, vol. 1, part 1, part 2.

Hull Scientific & Field Naturalists' Club Transactions, vols. I., II., III.; vol. IV., part 1.

Proceedings of the Yorkshire Geological Society, vol. 14, part 1—Hawell's “Peat Deposit at Stokesley.”

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Transactions of the Leeds Geological Association, part 14, 1905-8.

Bradford Natural History & Microscopical Society—Recorders Reports for 1906.

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