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NATURAL HISTORY TRANSACTIONS
OF
NORTHUMBERLAND, DURHAM,
AND
NEWCASTLE-ON-TYNE,
BEING PAPERS READ AT THE
MEETINGS OF THE NATURAL HISTORY SOCIETY
OF
NORTHUMBERLAND, DURHAM, AND NEWCASTLE-UPON-TYNE,
AND THE
TYNESIDE NATURALISTS' FIELD CLUB, 1894-99.
VOL. XIII.



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RICHARD HOWSE, *Editor.*

old Series

1896 - 1900

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NATURAL HISTORY TRANSACTIONS

OF

NORTHUMBERLAND, DURHAM, AND NEWCASTLE-
UPON-TYNE.

ADDRESS TO THE MEMBERS OF THE TYNESIDE NATURALISTS' FIELD CLUB.

READ BY THE PRESIDENT, J. F. SPENCE, ESQ., NORTH SHIELDS, AT THE
FORTY-SEVENTH ANNIVERSARY, HELD IN THE LIBRARY OF THE
MUSEUM OF THE NATURAL HISTORY SOCIETY ON WEDNESDAY,
23RD MAY, 1894.

LADIES AND GENTLEMEN,—When I found during my absence from home twelve months ago that you had done me the unexpected and undeserved honour to elect me your President for the year, I felt strongly tempted to ask you to excuse me; not because I did not feel an intense interest in the valuable scientific research which the Tyneside Naturalists' Field Club was founded to cultivate, but because I felt that I, a mere dabbler on the outskirts of Natural Science, was entirely unfitted to occupy the position which by your kindness I do to-day; and I feel this the more when I look over our records and see amongst our former Presidents and members the names of such men as the brothers Hancock, Canon Tristram, Dr. Norman, Mr. Joshua Alder, Dr. Embleton, Professor Brady, and a host of others, some of whom are with us to-day, and others are gone from amongst us—men whose names are closely and many of them illustriously associated with the study of Natural Science. I cannot but think that I am wholly unworthy of the honourable position in which you have placed me. Having said so much, I will to the best of my ability, and in accordance with time-honoured custom, proceed to give a *resumé* of the salient points

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connected with our excursions during the past year; and then, with your permission, say a few words on other matters, which I think may interest our members.

Commencing with our first excursion in May, the following one in June, and those in August and September, I must plead guilty to the charge of being absent; and I am exceedingly indebted to our Honorary Secretaries, who have very kindly done me the favour to send records of the proceedings, which will speak for themselves.

“THE FIRST FIELD MEETING was held on Monday, the 29th of May. In consequence of the very wet day most of the members, who assembled at the Central Station, decided not to venture into the country, especially as one of the Secretaries had been informed by telegram from Hexham that the weather was as bad or worse farther west. A few members and friends were not to be deterred by the rain, and visited Staward, and found not only the weather but the wretched shelter and refreshments offered them at Staward of the most ungenial, exorbitant, and worthless kind. A more favourable meeting was held here later in the year.”

“OUR SECOND FIELD MEETING was held on Thursday, June the 14th, at Bellingham, as no arrangement could possibly be made for holding the meeting at Kielder, or further up the North Tyne. The party left Newcastle a few minutes after eleven, and soon began to enjoy the beautiful scenery along the banks of the river. After partaking of a comfortable luncheon at the Railway Inn at Bellingham, three new members were elected; and our Honorary Secretary, Mr. Thomas Thompson, exhibited a clutch of six eggs of the Hawfinch, which had been taken a short time previously in the neighbourhood of Winlaton. It is only of late that the Hawfinch has been known to nest in the Tyne district, and it is to be hoped that the nesting propensities of many Tynesiders will not drive the bird entirely from the neighbourhood to some more secure retreat, if such can

be found. A start was soon made to explore the Hareshaw Burn, though the weather overhead was portentous of rain. Much time was spent about the old iron workings and examining the rock sections before reaching the wooded part of the burn. All the spring plants were in flower—the Pencilled Vetch, and many others, which have been many times recorded from this well searched locality; though a place so much visited by pleasure parties and fern gatherers is sure to lose annually many of its rarer plants, and Hareshaw Burn is not excepted. The nesting places of several birds were observed; some photos were taken, and time spent and enjoyed as only townspeople freed from care can enjoy themselves along this beautiful rocky burn. Under umbrellas—for it had commenced at midday to rain steadily—we reached the Linn, and sheltered under the huge overhanging cliffs, enjoyed the splashings of the noisy burn, the noise of a colony of jackdaws, the steady patter of the not unwelcome rain on the foliage, on which the eye rested with delight, and the novelties of the surrounding scenery. We had gathered the wild flowers; we had observed and admired the seven or eight species of ferns; had lingered at every waterfall and section of rock; observed the birds that came in view; and discoursed at length on many subjects—and thus, though we made no discoveries new to science, we spent several pleasant and happy hours, notwithstanding the steady and heavy fall of rain that followed us up and down the burn.. A comfortable rest and dinner at the Railway Inn soon brought our enjoyed excursion to a close.”

The THIRD FIELD MEETING was held at Dumfries on Monday and Tuesday, the 17th and 18th of July. Taking advantage of an arrangement made by the Secretaries, four or five members were enabled to leave Newcastle on Saturday, and thus spend Sunday in this quaint old corporate town, whose charter was granted by Robert the Second in 1395, though it had previously been raised to the dignity of a royal burgh by Special Charter during the reign of William the Lion about the year 1190. Those members of your club who went on Saturday proceeded

via Carlisle and the Glasgow and South Western Railway. The journey was most enjoyable, and with pleasant companions and much interesting talk seemed very soon over. On arriving at the appointed quarters (the Commercial Hotel) the party were much pleased to find such a comfortable, homely inn, and one with a history. It was in the sitting-room which they occupied that "Bonnie Prince Charlie" held High Court for three days in December, 1745, having converted it into a little palace. Here he held levees, and tried to extort a large sum of money (said to have been £4,000) and 1,000 pairs of shoes out of the Dumfriesians by threats, etc. A false alarm, however, caused him to beat a retreat, having first secured about £1,100 in hard cash and 225 pairs of shoes for his followers, and carrying off with him two of the most illustrious citizens as hostages for the payment of the rest of the money.

After partaking of needful refreshments, it was decided to have a conveyance, and drive over to New Abbey and the Solway Fisheries, with a view to make arrangements with Mr. Armistead as to the Monday's visit of the Club. After a very delightful ride of seven or eight miles through lovely rural scenery, and often through long and beautiful avenues of splendid elms and trees of many kinds, New Abbey was reached, which was partially inspected; and then about a mile further away we came to the "Shanty" at the Solway Fisheries, the charming residence of Mr. and Mrs. Armistead and their family, by whom we were most kindly received, and who made arrangements, not only for showing the members of the Club on Monday all the mysteries of this very successful fish hatchery, which is situated almost under the shadow of the high hill called Criffel, but also for their creature comforts. The following day (Sunday) was spent in Dumfries and its environs, some of the party attending the church where the poet Burns and his family worshipped when living in Dumfries. The town is full of memorials of Scotland's world-famed bard. A very pleasant ramble by the banks of the Nith to the ruins of Lincluden Abbey was also much enjoyed. This abbey was built about the middle of the twelfth century by Uctred, Lord

of Galloway, as a convent for Benedictine nuns. A more charming or picturesque situation cannot be imagined. The river Cluden, which joins the Nith close by, is a lovely little wooded stream, and must at one time have laved the banks of the Abbey garden. Just below the junction of the two streams the Nidd widens into a pool or linn, and hence the Abbey is supposed to have received its name of Lincluden. Numerous very interesting remains of this Norman structure, including many ancient monuments, were carefully noted; but time would fail, and you would be tired out, were I to attempt to enumerate them.

On Monday morning our party was increased by only one arrival, the Rev. Arthur Watts, who, to his credit be it spoken, had come all the way beyond Durham, setting an example by his early rising to other members who reside within a much easier distance; in fact, we could but conclude that he must have had no rest at all. Very shortly after the party set out to visit the Solway Fisheries. On arrival we received a most hearty welcome from Mr. and Mrs. Armistead and their charming family, and were soon deep in the mysteries of artificial spawning, hatching, and growing to maturity the several kinds of trout, which is so admirably and successfully carried out by this enterprising gentleman, his son, and assistants. Of course, at this time of the year there was no actual spawning and hatching going on, but the very capital apparatus and the very lucid explanations of the whole process which were given enabled the most obtuse amongst us not only to grasp the situation, but to see also what extreme care and caution must be exercised in dealing with the spawn and young fish: the very slightest error might produce fatal results, and thus the work of weeks be destroyed. From this part of the process we were taken step by step through the life of the young trout—from the day when it is hatched until it becomes the splendid creature of which we saw thousands in the ponds. It is quite clear, before you have been many minutes in the company of these gentlemen, that everything connected with the work has been most carefully thought out. The extraordinary cleanliness

and neatness of the whole place, and the care which is taken that the water with which the ponds (sixty in number) are supplied, together with all manner of contrivances, which you notice at every turn, prove beyond doubt that it must have been the work of years to bring this successful hatchery to its present state of perfection. The question of these fisheries from other points of view was so ably and exhaustively dealt with by my predecessor in office, Professor Brady, that I should only be repeating in a much feebler manner what has been already so well said, were I to attempt to touch it. Moreover, a copy of his address will appear in our printed Transactions.

After spending several very pleasant hours examining all the wonders of Mr. Armistead's hatchery, we were invited into the house, and most hospitably entertained to a sumptuous lunch, to which, having breakfasted early and driven eight or ten miles through the clear mountain air, we were all ready to do ample justice to; but as we sat and talked of many things, time flew apace, and all too soon. After looking through their lovely garden, and noting the luxuriant manner in which many varieties of flowering shrubs, trees, and flowers were growing which barely exist with us on the banks of the Tyne, we had to bid our kind friends farewell, and drove on to visit the ruins of New Abbey, often called Sweetheart Abbey.

This lovely old ruin was founded about the year 1275 for the Cistercian Monks by Devorgilla Baliol, a lady distinguished for her piety and munificence. She died in 1289 at the age of eighty, and was buried in the Abbey. Her husband, John Baliol, died twenty years before her, and was buried in Teesdale, but his sorrowful widow had his heart embalmed and casketed in a "coffyne of evorie," which she kept beside her until the Abbey was finished, when it was built into the wall over the high altar. When she died this precious relic of her never-forgotten lord was taken from its stone enclosure and laid upon her bosom, so that the hearts which true love united might moulder away together. This circumstance, it is said, caused the name of Dulce Cor, or Sweetheart, to be given to the Abbey. It is built of Permian red-sandstone, and is of the First

Pointed period, when slender pillars, composed of clustered shafts round a circular pier, and lancet-headed windows, with scanty feathering, bold buttresses, and high-pitched roofs were in vogue among the ecclesiastical architects. In its early days it must have been a magnificent building, and even now in its ruined state is very beautiful, and, like all old ruins, in the crannies and holes of its walls is the abode of ferns and wild flowers, the well-known Wall-Rue, *Asplenium*, *Ruta-muraria*, being very abundant. As we drove along the road from the Shanty to New Abbey the air was filled with the perfume of the Sweet Gale, *Myrica Gale*—a deciduous shrub new to most of us, which was growing in great profusion at the road side. We were shewn several heads of the Roebuck, which had been killed near the Fisheries, and informed that they were not rare in this part of Kirkcudbrightshire. A lovely drive through the cool evening air brought us back to our comfortable quarters in Dumfries.

Tuesday morning we made an early start, and spent the remainder of the time at our disposal in visiting the ruins of Carlaverock Castle, which lies between the rivers Nith and Lechar, about eight miles to the south of Dumfries. This is said to be one of the finest specimens of castellated architecture in all Scotland. A castle is supposed to have stood here in the sixth century. In the year 1097 it was the chief seat of the Maxwells, one Eugene Maxwell of Carlaverock having joined in the siege of Alnwick during that year. The castle was subjected to repeated sieges, and became so dilapidated that about the year 1420 it was restored. It certainly is a most beautiful ruin, and we spent two hours most pleasantly in examining it throughout. As we drove down from Dumfries towards the shores of Solway Firth the tide was out, and many kinds of gulls and other birds were busy on the muddy flats on the banks of the Nith. As we returned to Dumfries the tide had risen, and the Solway and Nith looked altogether different; instead of muddy flats was the broad expanse of blue water, with Criffel as a background. We soon turned off, however, and took a different road back to Dumfries. The weather had

now changed, and before we reached our journey's end a pelting rain came on, reminding us that this is a world of change, and that we ought to feel thankful that we had been favoured on the day before with such fine weather. Later on in the afternoon we left Dumfries behind *en route* for Newcastle, the whole party having much enjoyed this excursion.

"The FOURTH FIELD MEETING was held at Staward Peel and Haydon Bridge on Wednesday, the 23rd of August. It had been fixed for Sadbergh, but it was considered much too late in the year for so distant a meeting, and also not desirable to hold two distant meetings in the same year; consequently, a meeting was arranged for Staward Peel and Haydon Bridge. It will be in remembrance that the attempt in May was a failure, on account of the very bad weather.

The day was fine, and there was a fair gathering of members, who scattered themselves about amongst the beautiful scenery of the Allen; some extended their excursion to higher parts of the river, but afterwards all worked their way down stream, botanizing so far as the late season would allow, and obtaining refreshments here and there as opportunity offered, as no fixed meal was arranged for, and thus wending their way down to Haydon Bridge in due time. Many of the members visited Langley Castle, which was courteously shewn to the visitors. During the course of his ramble Mr. Cobb obtained several rare plants."

"The FIFTH FIELD MEETING was held at Wycliffe-on-Tees on Wednesday, the 20th of September. On arriving at Winstone Station they drove by Winstone Bridge, where there is a very fine and unique view of the Tees, both up and down the river. The bed of the stream, when at its ordinary level, is studded with large erratic blocks, many of them Shap Fell granite, as it is called; and at about this place the uppermost bed of carboniferous limestone is seen in section on the south bank of the Tees. On arriving at Wycliffe the members were courteously and kindly shewn by Mrs. Erskine of the Rectory all the historical attrac-

tions of Wycliffe; among these an old portrait of John Wycliffe the Reformer, who lived and died at Lutterworth in the fourteenth century, which portrait was presented by Dr. Zouch, Rector of Wycliffe in 1796, as an heirloom to the Rectory House. The church was next visited, and the brasses noticed—memorials of various later members of the Wycliffe family, which became extinct in the latter part of the sixteenth century. After enjoying a view of the Tees from Whorlton Bridge, the party drove by way of Thorpe to Greta Bridge. Rokeby Park was next traversed, and all its historical associations pointed out, till at length the junction of the Greta with the Tees was reached. From this point a quiet walk by the Tees to the Abbey Bridge,

“Where Tees full many a fathom low
Wears with its rage no common foe,”

soon brought the day's excursion and the very enjoyable meeting to a close at Barnard Castle.

The SIXTH AND LAST FIELD MEETING of the year was held on Friday, the 13th of October, at Black Hall Rocks and the sea coast to the mouth of Castle Eden Dene. A fine morning brought together about nine or ten members and their friends, who left Newcastle at 9.25 *via* Sunderland. On reaching Hesleden, late Castle Eden Colliery Station, the party alighted, and proceeding along the road enquired their way to Hesleden Dene, intending to proceed by that route to the shore, and so to Black Hall Rocks and Deneholme. It so happened that we were wrongly directed; and as none of the party had ever visited the locality before, or, if they had, were no wiser than those who advised us as to our way, we found we had travelled in the wrong direction, by a very winding road, and finally came to one of the private entrances to Castle Eden Dene. As time was getting on a council was held, when it was decided not to turn back, but if possible to obtain permission to make our way by the Dene to the shore. Fortunately, a young lady of our party was acquainted with the family who were occupying Castle Eden Cottage close by, and she at once kindly

volunteered to obtain permission for us to pass down that way. This she very speedily did, thus relieving us from our awkward dilemma.

It would be a mere repetition on my part were I to attempt to give a lengthened description of this lovely Dene—of its plants, its flowers, its birds, and all the interesting natural objects with which it abounds, and which, thanks to the careful foresight of the Rev. Mr. Burdon, have been so carefully preserved for the good of those who study natural history. Had it not been for the care which has been exercised, I fear many a rare plant and bird would have been lost to the district, which in the wild woods of this lovely Dene are allowed to grow and perfect their seeds and increase, and build their nests and bring up their young in peace and safety. Under the guidance of a member of the family who so kindly helped us on our way, and to whom we feel a debt of gratitude, some of us visited the Gunner's Pool, and other wild parts of this lovely ravine, whilst another section made their way by another route to the mouth of the Dene. On meeting close to Deneholme our kind guide left us, with many expressions of our thanks. It now dawned on us that we had reached the place about half-past one where we were to have had tea about four o'clock. There was nothing for such a lot of thirsty souls but to take any kind of refreshment which was forthcoming, and then proceed on our way—I cannot quite say rejoicing, as we still had a long walk before us, and no prospect of food. The ladies of the party, however, set the sterner sex a rare good example. Reaching the wonderful limestone rocks at Black Hall about the time we should have been sitting down to tea "with toast and muffins hot," we could but inwardly bless the rustics who had sent us the wrong way about. Leaving these marvellous rocks we made our way, after visiting the Coastguard Station, towards Hesleden, where we were to join the train. Before reaching this we fell in with a gentleman, who kindly shewed us the way we should have taken in the morning. Several of our party went a mile or more down Hesleden Dene, and found it very picturesque, with wild, rocky, well-wooded

banks, and a babbling brook at the bottom. We had to leave its beauties further down to the more fortunate explorers of a future excursion. It may be said that most of us—nay, all—enjoyed the beautiful scenery and lovely day very much, and had we been able to satisfy the cravings of our natural appetites in a proper manner, we would no doubt have enjoyed it much more. It is very difficult to make suitable arrangements for food in an out-of-the-way place, unless an approximation of the number likely to require it can be sent a day or two before to the Secretaries. This is a point which many of us are very liable to forget; and I think it is quite clear, that unless we do give notice to the gentlemen who kindly act as Honorary Secretaries, we have ourselves to blame.

During our rambles Mr. Cobb, one of our botanical members, noticed many plants, but I am not aware that he made any fresh discoveries, though in such a favourable place as this, where all natural objects are so carefully protected, there may be "many a flower" which has been "born to blush unseen," and it is careful observers such as our friend who may come across rarities which have hitherto been unobserved even in this favoured locality.

Since my address was written I have heard, with much regret, of the death of Mr. Joseph Blacklock. Mr. Blacklock was one of our original members, and was one of the twenty who met at Ovingham and attended the first Field Meeting at Whittle Dene on May the 20th, 1846. Our friend was in its early days a regular attender at the Field Meetings. Though not engaged in any special pursuit in Natural History he served the Club for many years on the Committee and as Vice-President. He was also one of the group of Newcastle Naturalists who met on a Wednesday evening alternately at each member's house. This Club was one of the influential means adopted by the Newcastle Naturalists to promote a love of Natural History. With Mr. Blacklock we have lost another landmark in the history of the Club, and also a kindly-hearted gentleman, whose presence at the meetings of the Club in former times was always cheering and helped to enhance the pleasure of those early meetings.

In a former part of this paper considerable allusion has been made to the successful and valuable work which is being carried on at the Solway Fisheries in the hatching and rearing of fresh water trout. As a means of replenishing the stock in over-fished waters, such work as Mr. Armistead is carrying on is invaluable. The question has often arisen in connection with the work of the Sea-Fisheries Committee for Northumberland, whether it would not be possible to establish, on some suitable part of our coast, at moderate cost, a hatchery, which, with ready access of salt water fresh from the sea every tide, with prudence, and careful supervision, might become of very great value to the sea fisheries of the district. This is a problem well worthy of the consideration of all those who feel that a good supply of fish is of vital importance to the country; and when we know, by the carefully conducted observations which have for the last few years been carried on by the Scientific Investigations Committee of the Scotch Fishery Board, that some kinds of fish, which are invaluable as human food, are, so far as can be judged, rapidly decreasing in numbers from one cause or another, and that amongst these causes are over-fishing and the destruction of enormous quantities of immature fish, I think it is quite clear that any means which can be adopted to re-stock our waters is well worthy of encouragement, and should without hesitation be adopted. No doubt greater care on the part of trawlers, to return as speedily as possible to the sea the immature, and in many cases utterly valueless fish, (except for manure), might be of great service. The interesting vitality experiments carried out on board the Lancashire Sea Fisheries Scientific Trawler the "John Fell," prove that the tenacity of life of many kinds of fish is far greater than has been supposed, and that if the fishermen could only be persuaded to return the immature and valueless fish to the water at once, large quantities would live to grow up and increase which have hitherto been destroyed. No doubt the bye-law which prohibits fishing within the three-mile limit is a step in the right direction, and as this limit on many parts of our coast extends from headland to headland, leaving in many

instances deep bays, and thus large tracts of ground, where the young fish are enabled to lie and feed unmolested, one can but hope that their natural instinct will in course of time lead them to seek these undisturbed places. We know that quadrupeds, birds, and other living creatures, leave haunts where they are incessantly disturbed, and seek places where they can in peace and quiet rear their progeny; and I do not see why fishes should not do the same. Two very valuable Reports to the House of Commons have been issued during the past twelve months—one an account of the third annual meeting of representative authorities held under the presidency of the President of Trade in June last, under the Sea-Fisheries Regulation Act; and the other the Report of a Select Committee on Sea-Fisheries. Such enquiries as these must do good, because information is gleaned from all parts of the coast, and it is only by gathering together all the information we can, and carefully compiling and comparing it, that we can draw just conclusions on matters such as these. The Technical Education Committee of the Northumberland County Council has been doing excellent work during the last two winters, by obtaining the services of Mr. Greig Wilson, M.A., B.Sc., of Edinburgh University, who is a thorough expert in all the last discoveries in fishery matters, to lecture to fishermen at all the large fishing centres and villages on our coast. The amount of information given at these lectures, which were all illustrated by the lantern, on the spawning habits, feeding-ground of immature and full-grown fish, their growth and time of coming to maturity, and a vast fund of other valuable information, was evidently much appreciated; and I hope that year after year the same course may be adopted, as by such means as this a great amount of useful information must be spread amongst these hardy, hard-worked men, who toil all night for our benefit.

I cannot close these few cursory remarks on fishery matters without alluding to the valuable "Catalogue of Fishes of the Rivers and Coast of Northumberland and Durham and the adjacent Sea," compiled with great care by our esteemed Honorary Secretary, Mr. Richard Howse. A more complete

catalogue could not well be imagined, and it is very difficult to find a fish in the sea off our coast which he has not had by the tail, or is not mentioned in this valuable catalogue. The fish trade which has been fostered at the Fish Quay at North Shields has now assumed such large proportions that it is likely soon to make this fishing centre at the mouth of the Tyne one of the largest in the kingdom. It is giving employment to hundreds of people who would otherwise have but little to do. I have often thought it might be well if the Natural History Society could see its way to send our admirable Curator, Mr. Howse, down once a week to spend an hour or two amongst the fishermen. I am sure we should be repaid by the acquisition of many a rare specimen which, by the untutored mind, is looked on as rubbish, but to the naturalist is of great value. It is only in few instances that these rarities are brought ashore, whereas if such an arrangement could be carried out I am sure we should reap a rich harvest. In Mr. Thomas Mackenzie, the Fish-Quay Master, Mr. Howse would have a sympathetic helper.

Ladies and gentlemen, I fear I have tired you; a few more lines, and I am done. Some of us, whose love of the beauties of Nature, it may be said, was born in us, can no doubt tell of the delights of early morning rambles, and how we noticed that all living things seemed to be waking up to enjoy themselves after the refreshing hours of rest, which do so much to recuperate exhausted nature; for let us remember that all living organisms, be they ever so minute, have their part to play and their work to do in this marvellous world of ours, and that many of them—probably most—rest during the hours of darkness. Then what better time can there be to watch them, and endeavour to ascertain their habits and mode of living, than in the quietness and freshness of an early spring or summer or autumn morning? But there are other reasons which should make the lover of Nature an early riser. Let us for a few minutes look at one of these. Let us suppose, ladies and gentlemen, that three or four young people have determined some fine evening, after a close, sultry day, to rise very early

and enjoy the freshness of a lovely autumn morning, and see the sun rise; and so, sometime before break of day they are up and off to wander along the higher ground of our rocky coast, and walk along the headland in the sweet, cool morning air, when all is still except the slight sea breeze and the ripple of the tiny waves on the rocky shore; and as they ramble slowly along and commune together of what they have come out to see, they can discern, by the brightening of the sky in the far east, the lovely fleecy clouds piled in the summer air; but—"What is this?" they all exclaim, as from the horizon to the zenith there shoot up lovely golden streams of light, which come and go and flicker like the Aurora Borealis in a cold winter's night; and as they stand entranced and watch, the lovely fleecy clouds to north and south of them have their heaving edges all touched with gold most exquisitely. But the panorama spread before them changes each moment. "Ah! what is this?" they all exclaim, as far, far away in the eastern sky a golden streak of much greater brilliancy appears above the horizon, and every tiny wave of the sea has its tip flecked with gold, and these flecks of gold seem to be floating on an exquisite bed of amethystine blue liquid; and almost before the eye can take this in, it is changed again, and the whole of the sky and clouds are flooded with a most gorgeous colouring of rose and crimson and gold and purple, and the sea becomes one seething mass of lovely colours, changing every moment, when suddenly, as with a bound, the golden orb of day, which has caused all these marvellous effects, rushes above the horizon, and floods this world of ours with his beneficent rays; and we hear the birds singing, and the ploughman calling to his team, and the lowing of the cattle, and the far-off clang of the hammer, reminding us that we are still in this work-a-day world of ours, for we had almost forgotten, as we gazed on this wondrous scene, where we were, and felt as though we were looking through the open portals of some glorious region into which we were about to enter, and which we had not seen before. Ladies and gentlemen, this is no fancy picture which I have been endeavouring to paint, but one which in younger days I have often seen; and though it is

long now since I first witnessed it, it made such an indelible impression on the memory, by its extraordinarily marvellous beauty, that it can never be erased. One cannot help thinking that if more of our young people would, when opportunity offers, go out into the fields and lanes, and on to the shore, and examine for themselves the marvels and beauties of Nature, we should very soon see growing up around us a band of young Field Naturalists, who would renew the youth of this Club of ours, and by their zeal and their interest, and careful, painstaking research, make it, as it was in days of yore, one of the most active and noted Naturalists' Field Clubs in our country. Of one thing I am quite sure, and that is, that those who will take the trouble have but little idea of the amount of pleasure they have in store, and how much more they would enjoy their rambles on shore, by rocks, or streams, or mountains, and that their pleasure in these rambles would be increased a thousand-fold if they were taking an intelligent interest in all the lovely natural forms around them, instead of walking with no object in view. In conclusion, I must apologize to you, ladies and gentlemen, for the length of this address, and for my many shortcomings as your President, and thank you most heartily for the great honour you did me when you elected me to fill the office.

The following gentlemen were elected members of the Club during the year 1893-94 :—

ALEXANDER, T. D..... Shaftesbury Place, Gateshead.
 HILL, B. B. Edward Pease Library, Darlington.
 HULL, Rev. J. E. 4, Hylton Street, North Shields.
 THOMPSON, J. S..... Engine Works, Monkwearmouth.

FIELD MEETINGS, 1894.

JUNE 1ST..... Gosforth Park and Lake.
 JUNE 27TH and 28TH (Race Week) Teesdale.
 JULY 19TH Blanchland.
 AUGUST 15TH Bamburgh.
 SEPTEMBER 11TH..... Chollerford and Chesters.
 OCTOBER St. Mary's Island,

The following gentlemen were proposed and elected as Officers of the Club for 1894-95 :—

PRESIDENT.

Rev. Arthur Watts, M.A., Witton Gilbert.

VICE-PRESIDENTS.

D. O. Drewett.
John Glover.

T. W. Backhouse.

EX-OFFICIO VICE-PRESIDENTS.

D. Embleton, Esq., M.D.
Rev. Canon Tristram, F.R.S.
Rev. Canon Norman, F.R.S.
E. J. J. Browell, Esq., J.P.
Prof. G. S. Brady, F.R.S.

Rev. G. R. Hall, M.A., F.I.A.
G. H. Philipson, Esq., M.D.
A. S. Stevenson, Esq., J.P.
Rev. J. M. Hick, B.A.
John Philipson, Esq., J.P.

HON. TREASURER.

R. Y. Green.

HON. SECRETARIES.

Richard Howse

Thomas Thompson.

Faraday Spence.

COMMITTEE.

Prof. G. S. Brady.
Wm. E. Branford.
E. J. J. Browell.
Joseph Cobb.
D. Embleton, M.D.
George Harkus.

Rev. J. M. Hick.
Rev. Wm. Johnson.
G. H. Philipson, M.D.
John Philipson.
R. M. Tate.
J. F. Spence.

AUDITORS.

J. S. Forster.

Arthur Tranah.

II:—*On Entomostraca collected in the Solway District and at Seaton Sluice, Northumberland, during the Summer of 1894.*

By G. STEWARDSON BRADY, M.D., LL.D., F.R.S.

THE Solway itself and the shores immediately adjacent seem to have received very little attention from naturalists. Yet the district is, in other respects than its Natural History, an extremely interesting one,—very varied and beautiful in its scenery, secluded and quiet, and out of the usual track of tourists; with many picturesque and ruinous relics of a bygone age, abounding in streams and lochs fit to give employment to both naturalist and angler, and associated ineffaceably with at least two of Sir Walter Scott's greatest works, "Guy Mannerling" and "Redgauntlet," to say nothing of the "Raiders" of a more recent author, Mr. Crockett. It is, moreover, easily accessible, and I suppose it is largely due to the lack of hotels and other tourist accommodation that it is so little known except to residents in the neighbourhood. The bit of the district best known to me extends from the estuary of the Nith—separating Dumfriesshire from Kirkcudbrightshire, on the East, to the "Water of Fleet," which empties itself into Wigton Bay, on the West. This coast-line is of very diversified character, flat and sandy eastward, where it has behind it a large tract of marsh-land, the haunt of innumerable wild fowl, but rising westward into precipitous cliffs of limestone, which form in some places isolated pillars of considerable height, and in others are hollowed out into caverns, some of which are locally associated with the name of Scott's piratical hero, Dirk Hatteraick. Some of the streams—notably the "Water of Urr"—come down from a background of granitic hills, bringing with them a vast amount of fine detritus, which is deposited on the sides of their estuaries and in the Solway itself round about their mouths. In such cases the natural result is a very flat shore composed of a soft muddy sand stretching out very far seaward, and at low-water uncovered for stretches of many miles; a state of things not unlike that which is found in the more familiar Morecambe

Bay at Grange-over-Sands. These muddy expanses, when left by the tide, are seen to be covered with the contorted mounds thrown up by innumerable lug-worms; and so very closely packed are these that there is rarely a space of more than a few inches untenanted by its worm: they form, in fact, quite a conspicuous feature in photographs taken under these circumstances, and I do not doubt that the worms themselves, passing through their bodies in this way the mud laden with decomposing organic matter, which they absorb and assimilate, exert a most powerful sanitary influence in thus purifying what would otherwise become a reeking, pestiferous swamp. Beyond these lug-worms I am unable to say anything about the larger mud-inhabiting fauna of the district. I thought it very likely that *Echinocardium cordatum* and perhaps *Synapta* might be found, as they are in similar localities in the Clyde Estuary, but the little time which I spent in digging for them did not suffice to disclose any specimens. Nor had I any opportunity of dredging in the Solway Firth. The water is shallow and the bottom uniformly sandy. I think it would be sure to yield interesting Microzoa belonging to such groups as the Copepoda and Ostracoda; perhaps also Cumacea and Mysidæ, but the absence of cast-up *débris* on the shore—either of the larger Crustacea or Mollusca—seems to indicate a dearth of those creatures outside.

The littoral zone being chiefly of the character already described, there is not, except in certain restricted areas, much opportunity for shore-hunting of the ordinary kind. But away from the "sphere of influence" of the estuarine mud there occur occasional patches of inter-tidal rock with promising-looking pools: these are, however, fearfully storm-swept and incapable of affording much shelter to adherent animals. A few common Hydrozoa such as *Sertulariæ* and *Campanulariæ*, a few patches of "*Hydra-tuba*," and Ascidians, were I think, with *Alcyonidium gelatinosum*, about all that I noticed. Among swimming things there were however many Amphipoda and Copepoda; and I took also several specimens of the pretty *Mysis Lamornæ*. My most interesting captures were, however, made by washing the muddy deposit found on the bottoms

of some rock-pools, and by netting amongst the weeds of pools situated above ordinary highwater mark, but still subject to occasional tidal influx. The Copepoda found in these pools are here described, and it may also be noted that in some of the peaty pools and ditches of the neighbourhood occurred an interesting Ostracod, *Cyclocypris globosa*, and in White Loch a species still more interesting and more capricious in its distribution, *Darwinula Stevensoni*.

As regards the Botany of the district I can say very little. My last two visits were made about Midsummer, and at that time the sea banks were gorgeous with masses of Thrift and Red Cranesbill (*Geranium sanguineum*), the marshy flats with the golden flowers of the Yellow-flag, and the fells with thickets of *Rosa spinosissima* and numerous Orchids, the most conspicuous of which was the sweet-scented species, *Gymnadenia conopsea*. These, of course, are flowers which cannot be overlooked and are an ever-present delight to the eye and mind: less alluring species which need to be hunted for were for the most part passed unnoticed, and such as I did gather were of no particular interest.

The Ostracoda and Copepoda procured by washing the mud from intertidal rocks and pools are as follows:—

OSTRACODA.

- Cythere confusa*, Brady and Norman.
- „ *gibbosa*, Brady and Robertson.
- Loxoconcha pusilla*, Brady and Robertson.
- Cytherura gibba* (Müller).
- „ *similis*, G. O. Sars.

COPEPODA.

- Eurytemora affinis*, Poppe.
- Cyclopina gracilis*, Claus.
- Ectinosoma*, sp.
- Tachidius littoralis*, Poppe.
- „ *brevicornis* (Müller).
- Westwoodia nobilis*, Baird.

- Thalestris harpactoides*, Claus.
Delavalia palustris, G. S. Brady.
Dactylopus brevicornis, Claus.
Thalestris clausii, Norman.
Nannopus palustris, G. S. Brady.
Platychelipus littoralis, G. S. Brady.
Harpacticus chelifera (Müller).
Cletodes propinqua, Brady and Robertson.
„ *longicaudata*, Brady and Robertson.
Idya furcata (Baird).

It is interesting to note that some of the most remarkable species in this list were recorded by me years ago as occurring in salt-marsh pools at Scaton Sluice, and one of them,—*Delavalia palustris*,—was first described from specimens collected there. The other species found at Scaton Sluice are *Eurytemora affinis*, *Nannopus palustris*, *Platychelipus littoralis*, *Tachidius brevicornis*, and *T. littoralis*. The last-named species has not hitherto been recorded from the Northumberland Coast, and has very probably been confounded with *T. brevicornis*, which it closely resembles. *Platychelipus littoralis* was originally described, though imperfectly, from Suffolk specimens, and as those now obtained from the Solway enable me to give a better account of the species, I here re-describe and figure it more fully. Mr. I. C. Thompson has recorded *Platychelipus littoralis* and *Delavalia palustris* as occurring in a few spots on the coast of North Wales, always in muddy parts of the littoral zone.

Mr. T. Scott also has recently recorded* *Platychelipus littoralis* from the "Forth Estuary, near Culross, and also off Musselburgh." And respecting *Delavalia palustris* it is interesting to note the following remarks of the same accurate observer. "*Habitat*,—Estuary of the Forth in the vicinity of Culross, rather scarce. Common in brackish water pools at the mouth of the Peffer Burn, Aberlady Bay, female with ovisacs. *Delavalia palustris* appears to be restricted to localities where the water is more or less brackish. In the monograph of the

* Eleventh Annual Report of the Fishery Board for Scotland, p. 205.

'British Copepoda' it is recorded from only one locality—the mouth of the Seaton Burn, Northumberland. It may be of interest to enumerate some of the Copepoda that have been found associated together in the upper reaches of the Forth Estuary, as *Eurytemora affinis*, Poppe; *Tachidius crassicornis*, Scott;* *Delavalia palustris*, Brady; *Thalestris harpactoides*, Claus; *Platychelipus littoralis*, Brady; *Hersiliodes littoralis*, Scott; *Acartia longiremis*, Lilljeborg; *Temora longicornis*, Müller, etc." And still more recently† Mr. Scott has published a very similar list of Copepoda obtained from brackish pools near the head of West Loch Tarbert, Argyleshire. This list includes *Cyclops æquoreus*, Fischer (also obtained at Seaton Sluice); *Tachidius littoralis*, Poppe; *Delavalia palustris*, G. S. Brady; *Canthocamptus palustris*, G. S. Brady; *Cletodes tenuicornis*, Scott; *Platychelipus littoralis*, G. S. Brady. The general correspondence of this list with those of the Solway and Seaton Sluice as well as with those given by Mr. I. C. Thompson for similar situations in Lancashire and North Wales is quite remarkable.

Amongst the Copepoda found in the Seaton Sluice pools was one—*Nannopus palustris*, which I was unable from want of sufficient material to describe or figure very fully. This species does not seem to have been noticed by any other British naturalist except by Mr. T. Scott, who took it in 1891 "at the mouth of the Cocklemill Burn near Largo, Firth of Forth," but M. Eugène Canu has recently found it in the Estuary of Wimereux, Pas de Calais, and in his admirable memoir on the Copepoda‡ of that region, has given a completely illustrated account of it. M. Canu states that the animal was found where the common green seaweed *Enteromorpha intestinalis* was growing abundantly, and that in company with it were *Gobius minutus* and the two shrimp-like crustacea *Palæmonetes varians* and *Mysis vulgaris*. These are strictly brackish-

* This is a synonym of *T. littoralis*, Poppe.

† On new and rare species of Copepoda from Scotland (Annals of Scottish Natural History, January, 1895).

‡ Les Copépodes du Boulonnais, Morphologie, Embryologie, Taxonomie (Travaux du Laboratoire de Zoologie maritime de Wimereux—Ambleteuse, Tome vi.)

water species, but with the exception of *Tachidius brevicornis* and *T. littoralis* M. Canu does not mention any of the species associated with *Nannopus* at Seaton Sluice.

Perhaps even more interesting than the mud-inhabiting species are those found in the littoral sub-brackish pools already referred to. In these pools there was an abundant and varied vegetation, the precise constituents of which I did not take accurate note of, not being aware, in fact, that I had anything in my net more than the usual inhabitants of such localities. All that I can now say is that among the vegetable contents of the pools were green Algæ—probably *Enteromorpha*—and many of the ordinary amphibious plants and grasses. Amongst the microzoa were several species of *Cyclops*, some of the commoner *Cypri-didæ*, numerous *Notonectæ*, and Collembola (*Isotoma aquatilis*, Müller). The most interesting Copepoda were those now described, *Itunella subsalsa*, nov. gen. and sp., and *Canthocamptus subsalsus*, nov. sp.

FAMILY CANTHOCAMPTINÆ.

GENUS ITUNELLA,* nov. gen.

Body subcylindrical, straight or only very slightly sigmoid, scarcely at all tapered backwards, no constriction or distinct demarcation between thorax and abdomen: antennæ and limbs extremely short in proportion to the size of the animal. Antennules seven-jointed; secondary branch of antennæ small, consisting of one joint only. Outer branches of the swimming feet three-jointed: inner branch of the first foot two-jointed, of the second, third, and fourth one-jointed. Posterior footjaw forming a prehensile unguiculate hand.

The mandibles and mouth-organs generally are so extremely small that I have not been able to observe them satisfactorily, nor have I been able to detect any eyes.

Itunella subsalsa, n. sp. (Plate I.).

Female.—Antennule very short, scarcely more than half as long as the first cephalo-thoracic segment, seven-jointed, rather

* *Ituna*, the Roman name of the Solway.

stout in proportion to the length, only slightly tapered, joints nearly equal in length throughout: each joint bears one or more short and rather stout setæ, but there is no special sensory seta. Antennæ two-jointed; secondary branch consisting of one small joint only, with three or four small terminal setæ. Outer branch of the first pair of swimming feet three-jointed, the last joint very small and ending in three slender setæ, two of which are extremely long, the third and outermost being half as long as the rest, which are about thrice the length of the entire limb, including the protopodite: the first and second joints have each a long, stout spine and several small hairs on their outer margin; the second has also a single short seta on its inner margin: inner branch two-jointed, only a little shorter than the outer branch, its first joint bearing only a few short hairs on the outer margin, second joint equal in length to the first, but more slender, bearing at the apex two long and two very short setæ, and on the inner margin a single short seta: the second joint of the protopodite carries at the inner distal angle a stout curved spine which reaches as far as the middle of the second joint; and on its outer margin one much shorter spine. The second, third and fourth swimming feet are alike, having the inner branch of one, the outer of three joints; the first and second joints of the outer branch bear each a long and rather stout apical spine and a fringe of shorter spine-like hairs on the outer margin; the last joint has three apical setæ decreasing progressively in length from the innermost, which is longer than the entire limb; each of the three joints has also a minute seta at the internal apex; the inner branch is shorter than the first joint of the outer branch and has three terminal setæ, the central one about twice as long as the other two, which are subequal: it has also a few small marginal cilia externally. The fifth foot is almost rudimentary, the basal portion very short but wide, its internal portion fringed with four nearly equal ciliated setæ, its outer portion giving attachment at the outer angle to a long seta and to a single laminar joint, from which spring four unequal ciliated setæ. The head is coalescent with the first thoracic segment, the united lengths of the two being equal to about one-fifth of

the length of the entire body: there are altogether nine segments, exclusive of the caudal laminae, but the sixth (first abdominal) segment has an imperfect transverse division; the posterior margins of the somites are finely pectinated. Caudal laminae short, subquadrangular, not much longer than broad, about half as long as the last abdominal somite; apex bearing one long seta (about one-fourth the length of the body) and two minute setae; outer margin with two setae, about equal in length to the two smaller apical ones, and numerous minute cilia, internal margin smooth: no distinct anal operculum. Length (exclusive of tail setae) 0.85 mm.

Male.—Like the female in size and general appearance, except that the abdomen consists of five somites and that the margins of thoracic somites are less distinctly pectinated. Antennules geniculated, the first three nearly equal in length but successively decreasing in width, fourth very much enlarged and semicircular, the remaining three much smaller. First pair of swimming feet like those of the female; second pair similar excepting that the principal apical setae are much larger; inner branch of third foot somewhat conical in shape, with a dilated base, which is separated from the apical portion by a rather deep constriction, the apex furcate so as to form two lash-like processes; inner branch of the fourth foot very short, with two minute setae on the inner margin, and at the apex two setae, the outermost of which is simple, the other rather shorter and stouter, and having its inner margin produced into three small nodular or moniliform prominences. Fifth foot obsolete, consisting of only a few setae.

Habitat.—Taken in June, 1894, in a small pool a little above high-water mark near Rockcliffe, Kirkeudbrightshire, on the eastern side of the Estuary of the Urr, between the village and the Castle Point. The pool contained fresh-water vegetation but would be subject to influx of sea-water at times of unusually high tide: doubtless it would also be rendered slightly saline by spray during storms.

Amongst other Microzoa taken in the same pool were a Collembolid (*Isotoma aquatilis*, Müller), one Amphipod (*Gammarus*

locusta ?), one Isopod (*Arcturus longicornis*, Sowerby), some Ostracoda numerous larvæ of Insects, and various Copepoda, chiefly of the genus *Cyclops* and *Canthocamptus*.

This species might, with some little modification of the generic characters, have been included under the genus *Cletodes*: it is also nearly allied to *Enhydrosoma* and *Normanella*, differing from these chiefly in the build of the swimming feet. A still nearer relative is perhaps *Ophiocamptus*, Mrázek,* but in that genus the inner branches of the swimming feet are uniformly two-jointed.

GENUS CANTHOCAMPTUS.

Canthocamptus subsalsus, n. sp. (Pl. II., figs. 1-13).

Female.—Animal slender, limbs comparatively short, ovisacs reaching, when the ova are mature, as far or further than the base of the tail setæ. The somitic angles are more or less profusely pectinated with spine-like cilia—the amount of armature varying in different specimens. The last abdominal segment contains a pair of pyriform sacs which appear to communicate by ducts with the larger marginal setæ of the caudal laminæ. Caudal laminæ short, subquadrate, about as long as broad, bearing a few short, slender, marginal setæ, and at the apex three setæ, the central seta about as long as the abdomen of the animal, the outer half as long, and the innermost not much longer than the caudal lamina itself; the two larger setæ are sparingly plumose. Antennules slender, the last four joints nearly equal and somewhat narrower than the first four, sparingly provided with setæ, all of which are short. Antennæ having a secondary branch composed of one joint only with two slender apical setæ. Mandibular palp small,—one-jointed and bearing four (?) setæ. Penultimate joint of the posterior foot-jaw armed at the apex of the inner margin with a short spine, last joint ovate, its inner margin fringed with a series of delicate, short cilia, and bearing a slender terminal unguis. Inner branch of the first swimming foot three-jointed, first joint some-

* Beitrag zur Kenntniss der Harpacticidenfauna des Silaswassers, von Al. Mrázek. Píbram i. Böhmen.

what dilated, and more than equal in length to the two following joints, bearing one long seta near the middle of its inner margin, and several short ones on its basal half; second joint rather shorter than the third and provided with a small seta on the inner margin, third joint bearing three apical setæ, the innermost being the shortest; outer margin of all the joints fringed with minute setæ; outer branch composed of three nearly equal joints, which united equal in length the first joint of the inner branch; each joint is ciliated externally and also bears a spine-like apical seta, in addition to which the last joint has three apical setæ which are progressively longer from without inwards; the second pair of feet have the outer branch similar to that of the first foot but larger, and its second and third joints have each a seta on the inner margin; inner branch two-jointed, short; second joint twice as long as the first, bearing two marginal and three apical setæ and ciliated, as also is the first joint, on the outer margin. The third and fourth pairs do not differ materially from the second. Fifth pair foliaceous; the basal joint produced internally and reaching as least as far as the apex of the second joint, fringed with six principal ciliated setæ and a few more minute ones; the second joint, which is subquadrate also, bears six setæ—one much larger than the rest—some of which are shortly plumose. Length 1.3 mm.

Male.—The antennule of the male is swollen, geniculated, and falcate at the apex: the third swimming foot has the outer branch very stout and geniculated at the distal joint so that the extremity can be bent inwards; the last joint bears four stout marginal spines, the first and second joints each one strong spine and several smaller ones; inner branch three-jointed, short; first and second joints furnished with one, the third with two short setæ; fifth foot small, the basal joint bearing three short, stout, spine-like setæ on its inner segment, and two setæ externally, apical joint small and bearing four small unequal setæ.

Hab.—In a small pool above high-water mark at Rockcliffe, Kirkcudbrightshire: specimens numerous.

Platychelipus littoralis, G. S. Brady (Plate III.).

1880. *Platychelipus littoralis*, G. S. Brady, Monog. Brit. Copep., vol. II., p. 103, pl. LXXIX., figs. 20-23, and pl. LXXX., figs. 15-19.
1893. ,, ,, Scott, Additions to the Fauna of the Firth of Forth (Eleventh Ann. Rep. Fishery Board for Scotland), p. 205, pl. V., figs. 11-13.
1893. ,, ,, Thompson, Revised Report on the Copepoda of Liverpool Bay (Trans. Liverpool Biol. Soc., vol. VII.), p. 27, pl. XXII., fig. 2.

Like *Laophonte* in general outline, but with unusually short limbs; no constriction between thorax and abdomen, the anterior abdominal being equal in width to the last thoracic segment, posterior margins of the hinder abdominal segments finely pectinated. In the female the last abdominal segment is twice as long as the preceding one. Antennules of the female six-jointed (?), bearing numerous short, rigid, marginal spines, and at the extremity about six not very long setæ: in the male the antennules are short and indistinctly jointed; the penultimate joint much swollen and subglobose, the last forming a very strongly curved hook. Antennæ two-jointed, without any secondary branch, the distal joint bearing at its extremity numerous curved setæ, about six of which are of considerable length; the proximal half of the outer margin has a series of about six smaller setæ, which increase successively in length from the first (or proximal) to the last; the basal joint is larger and bears a few setæ, the largest of which—two on the inner and one on the outer margin—are plumose. Mandible stout, divided apically into several stout teeth; palp large, elongated, indistinctly trilobed, composed of one joint only, the central lobe bearing three, the lateral lobes each one long plumose seta. Maxilla composed of four segments, the innermost or

biting portion quadrate and bearing on its free margin a series of curved unguiform processes; the remaining three lobes are digitiform and bear long plumose setæ. The first maxilliped has a wide basis, from which spring four short setiferous lobes. Second maxilliped prehensile, composed of two elongated joints, the last bearing a very long and slender apical unguis, which is provided on its concave margin with six very slender but comparatively long setæ. First and second pairs of thoracic feet alike in both sexes. The protopodite of the first pair is very large and wide, two-jointed, and bears numerous marginal setæ: inner branch two-jointed, the first joint about thrice as long as broad, the second not half as long as the first and bearing a very long apical unguis, which is swollen at the base and very sharply curved at the extremity; both joints bear several strong setæ on their inner and outer margins; the outer branch consists of two short, broad, and nearly equal quadrate joints, and is not much more than half as long as the first joint of the inner branch: its first joint bears a long spine on the outer margin, as well as one or two smaller setæ, the second also has a marginal spine, and on its truncated apex three similar spines and one rather long and slender seta; the innermost of the three apical spines is plumose. Inner branch of the second foot two-jointed, about as long as the first two joints of the outer branch, but much more slender, the two joints nearly equal in length, setiferous on both margins, the last joint bearing at its apex two long and equal setæ; outer branch stout, three-jointed, each joint bearing a fascicle of about three stout setæ on its inner margin; the outer margin of each joint provided with a long and stout spine as well as a few short setæ, those of the first joint being numerous and closely set; apex of the last joint truncated and armed with three strong spines. The third pair of feet in the female are almost like the second, but in the male are much stouter and more strongly spined, while the second joint of the inner branch has its margin prolonged into a large spinous process which reaches beyond the apex of the joint, and by its very wide base seems to divide the joint into two. Fourth pair of feet rather shorter, alike in both

sexes, outer branch three-jointed and much like those of the second and third pairs; inner branch very small, two-jointed, reaching scarcely further than the middle of the first joint of the outer branch, and bearing three long terminal spines. Fifth pair of feet in the male, rudimentary, the basal portion almost obsolete and bearing one detached external, and five internal setæ, two of the latter very small; the fifth foot of the female has not been seen. First abdominal segment of the male bearing a rudimentary bisetose appendage. Caudal laminæ shorter than the last abdominal segment, each one bearing six very short, slender setæ and one long stout apical seta, which is non-plumose. The length of specimens sent to me by Mr. Scott from West Tarbert is 0.9 mm.; but those from Rockcliffe are only about 0.65 mm. I have no record of the measurements of East Coast specimens.

The stations at which *Platychelipus littoralis* has been found are as follows: brackish pools at Seaton Sluice; Lake Lothing, Suffolk, and Rockcliffe, Kirkeudbrightshire (*G. S. B.*); low-water mud at Puffin Island, Llanfairfechan, Garth Ferry and Hale (*I. C. Thompson*); in brackish pools at West Loch, Tarbert, and in dredged material from the Firth of Forth off Culross and Musselburgh (*T. Scott*).

***Tachidius littoralis*, Poppe (Plate II., figs. 14-17).**

1881. *Tachidius littoralis*, Poppe, Naturw. Ver. Bremen Bd. VII., p. 149, Taf. VI.

1892. „ *crassicornis*, Scott, Additions to Fauna of the Firth of Forth (Tenth Ann. Rep. of the Fishery Board for Scotland), p. 250, pl. VII., figs. 14-27).

This species has already been fully described and figured by Herr S. A. Poppe and Mr. T. Scott. It has doubtless been frequently mistaken for the allied species *T. brevicornis*, from which, however, it may readily be distinguished by its extremely thick and blunt antennules and its generally more slender form as well as by minor differences of structure. It occurs commonly both at Seaton Sluice and Rockcliffe.

PLATE I.

ITUNELLA SUBSALSA.

- Fig. 1. Female seen from above } $\times 80$.
 2. Male seen from right side }
 3. Antennule of female.
 4. „ male, with rostrum.
 5. Antenna.
 6. Extremity of mandible.
 7. Second footjaw.
 8. Foot of first pair.
 9. „ second pair (male).
 10. „ „ „ (female).
 11. „ third „ (male).
 12. „ fourth „ (male).
 13. „ fifth „ (female).
 14. Caudal lamina and part of last abdominal segment

PLATE II.

CANTHOCAMPTUS SUBSALSUS.

- Fig. 1. Female seen from left side $\times 60$.
 2. Antennule of female.
 3. „ male.
 4. Antenna.
 5. Mandible and palp.
 6. Second footjaw.
 7. Foot of first pair.
 8. „ second pair.
 9. „ third „ (male).
 10. „ fourth „
 11. „ fifth „ (female).
 12. „ „ „ (male).
 13. Last abdominal segment and tail.

TACHIDIUS LITTORALIS.

- Fig. 14. Antenna.
 15. Second footjaw.
 16. Foot of first pair.
 17. Posterior abdominal segments and tail.

PLATE III.

PLATYCHELIPUS LITTORALIS.

- Fig. 1. Male seen from right side $\times 84$.
2. Antennule of female.
3. „ male.
4. Antenna.
5. Mandible and palp.
6. Maxilla.
7. First footjaw.
8. Second „
9. Foot of first pair.
10. „ second pair.
11. „ third „ (male).
12. „ fourth „
13. „ fifth „ (male).
14. Rudimentary foot of first abdominal somite (male).
-

Carex incurva, Holy Island.—The following note by Professor D. Oliver, F.R.S., was read by Professor Brady at the joint evening meeting on Feb. 22nd, 1895 :—“ You may care to have for the Museum Herbarium, and for exhibition at the Friday meeting specimens of *Carex incurva*, from its only English station—so far as I am aware. It was found on Holy Island some years ago, I think by a Mr. Farquharson, and I have searched for it there in vain until one day last August, when it caught my eye near the fishing station with a tower, on the Snook.”—*Prof. D. Oliver, F.R.S.*

NATURAL HISTORY SOCIETY
OF
NORTHUMBERLAND, DURHAM, AND NEWCASTLE-
UPON-TYNE.

ANNUAL MEETING, 26TH SEPT., 1894.

REPORT OF THE COMMITTEE, 1893-1894.

THE Committee regret to report a serious decrease in the membership of the Society during the past year. Sixteen members have died and eighteen have resigned their membership, against which only six new members have been elected. About 20,640 persons have paid for admission to the Museum during the past financial year, being a decrease of about 1,600 as compared with the previous year, which (as the attendance at holiday times was much better than in 1893) indicates a continued diminution in the general attendance of the public at the Museum. The Committee can suggest no reason for this diminution in the attendance, but the subject will receive their careful consideration.

As will be seen from the Hon. Treasurer's Account the decrease in subscriptions and admission fees has been more than met by the interest on Mr. Coppin's legacy (which now appears for the first time in the Accounts) and by a diminution in the working expenses of the Museum of about £100. The Committee have also carried the balance of the Maintenance Fund (£45 : 19 : 2) to the General Account.

The use of the Museum building has been granted during the past year to the Local Committees for the reception of the British Medical Association and the British Dental Association.

Through the kindness of Dr. Embleton and of Dr. G. S. Brady, Dr. Somerville, Prof. Potter, and Mr. Wilson, of the Durham Physical College of Science, and E. J. Garwood, Esq., the Committee were enabled to arrange another course of Saturday Evening Lectures. Most of these lectures were well attended by members, and there was a moderate attendance of others who were admitted at the ordinary fees.

The course comprised the following lectures :—

Jan. 20th. On the Moas, extinct Giant Birds of New Zealand.

Dr. Embleton.

Feb. 3rd. A month in Norway with Notes on its Natural History (illustrated).

Dr. G. S. Brady.

Feb. 17th. Tropical Vegetation in Ceylon (illustrated). Prof. Potter.

Mar. 3rd. On Insects injurious to Vegetation (illustrated).

Dr. W. Somerville.

Mar. 17th. On the Ancestry of the Horse (illustrated). Prof. Wilson.

Mar. 31st. The History of Photography (illustrated).

E. J. Garwood, Esq., M.A.

The extra cost for lectures, including lighting, advertisements, etc., amounted to £15 : 3 : 11, and the fees paid for admission realized £5 : 3 : 2, the lectures thus costing the Society £10. The average attendance at these lectures is estimated at about 120.

The work of the Society has been carefully carried on during the past year at the Museum, and as fully as the narrow income of the Society would allow. The Committee have gratefully to acknowledge a further donation from Lord Armstrong of £1,500 towards the completion of the fittings and furnishing of the rooms of the Museum. This sum is being spent in completing the furnishing of the gallery of the Bird Room for an arrangement of the more important and typical groups of Foreign Birds, and for furniture for the West Corridors, where the Mineral Collections will be arranged (which are now located in the Geological Room, where space is required for the full arrangement of the Dinning Collection of Fossil Fishes, and many other specimens which are now contained in drawers), and for the completion of the fittings in other rooms, and increasing the heating power required to keep the rooms at a proper tempera-

ture. They have further to acknowledge a bequest of £200 from the late Mr. John Taylor, who was for thirty years a member of the Society and a benefactor to its funds.

During the year the Committee have had to deplore the loss of many of its oldest and influential members whose places it will be hard to refill. Among these Lady Armstrong, Mr. Joseph Blacklock, Mr. Wm. Dinning, T. W. Embleton, Methley, Leeds, and Mr. John Rogerson. Lady Armstrong became a member of the Society in 1863, and from the first exerted herself in many ways for the welfare of the Society and took an active interest in its progress. For many years her ladyship subscribed annually ten guineas to the funds of the Society, and through her generosity the invaluable collection of Local Coal-measure Fossils collected and worked out by Mr. Thomas Atthey was secured for the Museum. Lady Armstrong took great interest in the erection of the new building at Barras Bridge and contributed nearly £4,000 towards the funds, and afterwards entirely furnished two rooms, one for the Committee and a drawing room for ladies, at her own expense.

Mr. William Dinning was elected a member and Secretary in 1874 and held this appointment for nearly twenty years. With Mr. John Hancock he spent much time in preparing the plans and other arrangements for the new building at Barras Bridge, and so devotedly, that the Committee in their general report in 1887 specially thanked him "for his careful foresight and superintendence of the work in progress, but for which many important details would have been left out or overlooked and much time lost and extra expense incurred." This supervision and attention to the welfare of the Museum Mr. Dinning continued until the last day of his life, at which time he was busy with the alterations necessary for the display of his large collection of Fossil Fishes which he had formally bequeathed to the Society. Mr. Dinning was from a child enthusiastically inclined to the pursuits of Natural History, and as far as strict attention to business would allow, spent considerable time in collecting specimens and forming collections in several branches of Natural History.

We have further to deplore the loss of one of our oldest members, Mr. Joseph Blacklock, at the ripe age of 80. Mr. Blacklock was elected a member of the Society and Committee in 1846, and on the retirement of Mr. W. K. Loftus in 1848, undertook the Secretaryship, which he held for twenty years. On the resignation of Mr. Ralph Brown he was appointed Hon. Treasurer, which office he held with much advantage to the Society till within a few years (1888), when, on account of illness and increased physical infirmities, he was reluctantly compelled to resign after having held these important offices in succession for forty years. Though not a naturalist by pursuit, and having no special scientific object in view, Mr. Blacklock was from early life closely connected with all the older naturalists of the district, sharing in their excursions and rambles and associating with them in all their scientific meetings. In this manner his services as Secretary became specially valuable to the leading members of the Society, and his constant aim was to promote the welfare of the Museum by a most careful attention to the financial department as well as to the general progress of the Society. In all his labours he was aided much by the judicious advice of his near relative, Mr. Joshua Alder, and by his constant contact with other leading and influential members of the Society.

Mr. John Rogerson was elected and became a member of the Committee in 1848. Though engaged in business he took an active interest in the proceedings of the Society and contributed liberally to its funds. In 1887 he was elected a Vice-President of the Society.

Mr William Maling was elected a member and served on the Committee from 1870 till within a few years, when he was elected a Vice-President. He was enthusiastically devoted to Entomological pursuits for many years and formed not only a good local collection of Lepidoptera but also an extensive European collection.

Thomas W. Embleton, Esq., of Methley, Leeds, became a member soon after the formation of the Society in 1829, and was at the time of his death in 1894 the oldest surviving member.

Though not for many years a resident in the neighbourhood, he still kept up his early connection with the Society and contributed liberally to its funds and also to the collections of the Society.

The additions to the Library, chiefly of Transactions received in exchange with other Societies, consist of about 150 volumes and parts. About 100 birds and bird-skins have been presented during the year, the largest donation being a collection of forty birds from Terra del Fuego, collected and presented by Ernest Hobbs, Esq. Many water birds, most of which are now arranged in the Museum, were presented by Mr. J. Duncan and obtained from the Northumberland coast. Several other interesting birds have been presented by Miss Harvey, George Crawhall, Esq., Bryan Cookson, Esq., and others. Important additions to the collection of Antelope Horns have been made by Alfred Straker, Esq., Captain George Noble, and Charles Liddell, Esq., of Sandhoe. Some rare and curious fishes have been sent by Messrs. W. Clift, J. Duncan, F. H. Phillips, and others. Through J. F. Spence, Esq., a specimen of the rare *Scorpoena dactyloptera*, caught off the Northumberland coast by the trawler "Black Watch" (Capt. Whitfield), was presented to the Museum.

As mentioned before our late Hon. Secretary, Mr. William Dinning, has bequeathed his extensive collection of Marl-slate, Coal-measure, and Carboniferous limestone Fishes to the Society. A full list of all the donations presented through the year will be found appended to this Report.

The following ladies and gentlemen have been elected members of the Society during the present financial year:—

Clay, T. R., Elswick Lodge, Elswick Road.

Dinning, Mrs., Eldon Street, Newcastle-on-Tyne.

Knowles, W. H. Wyncote, Jesmond Park.

Reid, Walter C., 20, Percy Park, Tynemouth.

Thompson, Miss Mabel, Winlaton.

Ware, Charles W., Grosvenor Place.

ABSTRACT OF MINUTES.

ANNUAL MEETING, 26TH SEPTEMBER, 1894.

W. A. WATSON-ARMSTRONG, Esq., IN THE CHAIR.

The minutes of last Annual Meeting were confirmed.

The Hon. Secretary read the Committee's Report for 1893-4.

The adoption of the Report was moved by the Chairman and seconded by J. Pattinson.

The Report was adopted unanimously.

The Hon. Treasurer's Report was read by the Hon. Secretary.

Moved by Mr. Clephan and seconded by Mr. Irving that the Report of Treasurer be adopted.

The officers of the Society for 1894-95 were proposed for election by Mr. Sopwith and seconded by Mr. Ware, and elected unanimously.

Mr. John Philipson proposed a vote of thanks to the Chairman, which was carried with applause.

THE HONORARY TREASURER IN ACCOUNT

DR.

CURRENT ACCOUNT FROM 80TH JUNE,

[illegible]

WITH THE NATURAL HISTORY SOCIETY.

1893, TO 30TH JUNE, 1894.

Cr.

1894.	PAYMENTS.	£	s.	d.	£	s.	d.
June 30.	By Salaries and Wages:—						
	Richard Howse	200	0	0			
	Joseph Wright	100	0	0			
	John Jackson	12	5	0			
	Wm. Voutt	68	18	0			
	Albert Spencer	48	2	6			
	Mrs. Atkinson	26	10	0			
					455	15	6
	„ Incidental Expenses:—						
	Coal	6	2	6			
	Coke	15	12	8			
	Gas	6	2	7			
	Water	5	1	10			
	Electric Lighting	15	3	3			
	Advertisements	9	2	2			
	Taxes	7	2	8			
	Insurances	15	4	0			
					79	11	8
	„ Tradesmen's Accounts:—						
	Robson & Sons	37	7	1			
	Dinning & Cooke	14	8	4			
	Ferguson	24	1	10			
	Gurney & Jackson	1	10	0			
	G. G. Laidler	5	0	1			
	Walker & Son	1	5	9			
	John Bell	4	4	6			
	Middlemiss	7	10	0			
	P. Hall	1	4	0			
	Beck & Son	4	5	11			
	J. Jackson	18	2	0			
					118	19	6
	„ Sundries, per Joseph Wright				20	12	9
	„ Cheque Book				0	5	0
	„ Balance as per Bank Book				70	11	1
					£745	15	6

THOS. THOMPSON,
HON. TREASURER.

Examined and found correct.

E. O. REID,
AUDITOR.

THE HONORARY TREASURER IN ACCOUNT

CAPITAL ACCOUNT,

1894.		£	s.	d.
June 30.	To Invested in Newcastle Irredeemable Stock at 3½ per cent., as per last Capital Account ...	2000	0	0
	„ Invested in River Wear Commission Funded Debt at 4½ per cent., as per last Capital Account.....	500	0	0
	„ Invested in Tyne Commissioners Consolidated Fund at 4 per cent., as per last Capital Account.....	2000	0	0
	„ John Taylor's Legacy of £200 (less legacy duty), deposited in Messrs. Lambton & Co.'s Bank, Grey Street. Deposit Receipt No. 22361.....	180	0	0
		<u>£4680</u>	<u>0</u>	<u>0</u>

MAINTENANCE FUND,

1894.		£	s.	d.
June 30.	To Balance from June 30th, 1893, as per Bank Book	45	19	2

FITTING ACCOUNT,

1894.		£	s.	d.
June 30.	To Cheque from Lord Armstrong, paid into Messrs. Lambton & Co.'s Bank, on Fitting Account..	1000	0	0
		<u>£1000</u>	<u>0</u>	<u>0</u>

WITH THE NATURAL HISTORY SOCIETY.

30TH JUNE, 1894.

1894.	£	s.	d.
June 30. By Newcastle Irredeemable Stock at $3\frac{1}{2}$ per cent., as per Certificate No. 260	2000	0	0
„ River Wear Funded Debt, No. 967, at $4\frac{1}{2}$ per cent.	500	0	0
„ Tyne Improvement Commissioners Consolidated Fund at 4 per cent., Mortgage No. 5948, 30th Dec., 1892.....	2000	0	0
„ Deposit Receipt, No. 22361, Messrs. Lambton & Co.'s Bank, Grey Street	180	0	0
	<u>£4680</u>	<u>0</u>	<u>0</u>

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct, 29th August, 1894.

E. O. REID,

AUDITOR.

30TH JUNE, 1894.

1894.	£	s.	d.
June 30. By Transfer to General Account, per order of Committee	45	19	2

30TH JUNE, 1892.

1894.	£	s.	d.
June 30. By Cash, Messrs. Sopwith & Co.	297	9	0
„ Peacock, Durham	11	0	0
„ Balance in Bank.....	691	11	0
	<u>£1000</u>	<u>0</u>	<u>0</u>

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct, 29th August, 1894.

E. O. REID,

AUDITOR.

OFFICERS OF THE NATURAL HISTORY SOCIETY, 1894-95.

The following Gentlemen were elected as Officers of the Society for 1894-95.

PATRONS.

His Grace the Duke of Northumberland.
The Right Rev. the Lord Bishop of Durham.
The Right Rev. the Lord Bishop of Newcastle.

PRESIDENT.

The Right Honourable Lord Armstrong, C.B., F.R.S.

VICE-PRESIDENTS.

The Right Honourable the Earl of Ravensworth.
The Right Honourable the Earl Percy.
Sir M. White Ridley, Bart., M.P.
Sir Lowthian Bell, Bart., F.R.S.
Sir Andrew Noble, K.C.B., F.R.S.
Sir James Joicey, M.P.
The Worshipful the Mayor of Newcastle.

D. Embleton, Esq., M.D.	Alex. S. Stevenson, Esq.
R. R. Dees, Esq.	C. M. Adamson, Esq.
J. A. Woods, Esq.	I. G. Dickinson, Esq.
G. H. Philipson, Esq., M.D.	N. G. Clayton, Esq.
Thomas Bell, Esq.	W. A. Watson-Armstrong, Esq.
John Daglish, Esq.	Charles Mitchell, Esq.
J. W. Swan, Esq., F.R.S.	W. D. Cruddas, Esq.
D. O. Drewett, Esq.	Rev. Canon Norman, F.R.S.
H. N. Middleton, Esq.	Prof. G. S. Brady, F.R.S.
Rev. Canon Lloyd, D.D.	

HON. TREASURER.

Thomas Thompson, Esq.

HON. SECRETARIES.

A. H. Dickinson.	Prof. M. C. Potter, M.A.
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COMMITTEE.

Mr. H. T. Archer.	Mr. N. H. Martin.
Mr. E. J. J. Browell.	Mr. W. M. Pybus.
Mr. Robt. C. Clephan.	Mr. John Pattinson.
G. E. Crawhall.	Mr. John Philipson.
Mr. Samuel Graham.	Prof. W. Somerville.
Mr. R. Y. Green.	J. F. Spence.

HON. AUDITORS.

E. O. Reid.	Samuel Graham.
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HONORARY CURATORS,

1894-95.

ZOOLOGY.

VERTEBRATA.

D. Embleton, M.D.
Samuel Graham.

C. M. Adamson.
Thos. Thompson.

INVERTEBRATA.

Rev. Canon Norman.
C. M. Adamson.

N. H. Martin.

BOTANY.

Rev. H. E. Fox, Durham.
Rev. Wm. Johnson.

C. E. Stuart.
Prof. M. G. Potter.

GEOLOGY.

E. J. J. Browell
J. Daglish.
E. J. Garwood.

J. W. Kirkby.
Prof. G. A. Lebour.
Jno. Pattinson.

CURATOR.

Richard Howse.

KEEPER OF THE MUSEUM.

Joseph Wright.

LIST OF EXCHANGES AND DONATIONS TO THE MUSEUM
AND LIBRARY
OF
THE NATURAL HISTORY SOCIETY,
FROM JULY 1ST, 1893, TO JUNE 30TH, 1894.

AMERICAN SOCIETIES.

UNITED STATES OF AMERICA.

Boston :—Society of Natural History.

Proceedings, Vol. 26, Parts 1, 4. Nov. 1892—May, 1893.

Memoirs, Vol. 4, No. 11. 1893.

Occasional Papers, IV. ; Geology of Boston Basin, Vol. 1. *The Society.*

Boston :—American Academy of Arts and Sciences.

Proceedings, New Ser., 19.

Memoirs, „ Vol. 12, Part 1. *The Academy.*

Cambridge :—Museum of Comparative Zoology, Harvard College.

Bulletin, Geol. Ser., Vol. 2 ; Whole Ser., Vol. 16, No. 13, 14.

„ Vol. 24, Nos. 4, 5, 6, 7.

„ „ 25, Nos. 1, 2, 3, 4, 5, 6.

Annual Report of the Curator. 1892-93.

Report of the Results of dredging in the U.S. Coast Survey in the steamer "Blake," Vol. 14, No. 3. Crustaceans. Fam. Paguriens.

Prof. Alex. Agassiz.

Meriden, Conn. :—Scientific Association.

Transactions, Vol. V., 1893.

New York :—Academy of Science and Lyceum of Nat. History.

Annals, Vol. 7, Nos. 1, 2, 3, 4, 5. April, 1893.

„ „ 8, „ 1, 2, 3. July, 1893.

The Academy.

Philadelphia :—Academy of Natural Sciences.

Proceedings, Parts 2, 1893.

The Academy.

Philadelphia :—American Philosophical Society.

Proceedings, Vol. 31, No. 141. April—March, 1893.

„ „ 31. „ 142.

Transactions, Vol. 17, New Ser., Parts 3. 1893.

„ „ 18, „ „ 1. 1893.

The Society.

Rochester :—Academy of Science.

Vol. 2. Brochure 2. 1893.

The Academy.

St. Louis:—Academy of Science.

Transactions, Vol. VI., Nos. 2-8. 1892-93.

*The Academy.**Washington:—Smithsonian Institution: Bureau of Ethnology.*

8th Annual Report, Bureau of Ethnology. 1886-7.

9th Annual Report for 1887-8 (1892).

Bibliography of the Chinoskan Languages.

,, of the Salishan Languages (1892).

Washington:—Smithsonian Institution: Contributions to Knowledge.

Report for 1891 (1894).

Misc. Coll.—Meteorological Tabbs, 1893.

,, ,, Vol. XXXVI., Bibliography of Chemistry.

Miscellaneous Collections:—

No. 843, Mechanics of the Earth's Atmosphere.

630, Transactions, Anthropological Society, Washington, Vol. 3.

Nov., 1873—May, 1885.

664, Bibliography of Astronomy for 1887.

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ZOOLOGY.

1893.

MAMMALS.

July 27. Long-eared Bat, *Plecvtus auritus*, taken in a schoolroom at
Marske-by-the-Sea. *Mr. Geo. Monck, Marske-by-the-Sea.*

„ 31. Field Vole, *Arvicola agrestis*, Preston, North Shields.

Mr. J. Duncan.

- Aug. 29. Squirrel, ♂, Ross, Herefordshire.
Mr. Fred. V. Wallis, Coughton House.
- „ 30. Four Skulls of Antelopes, viz. :--
 The Beisa, *Oryx beisa*, ♂, juv, Somaliland.
 Sæmmerings Gazelle, *Gazella Sæmmeringii*, ♀, Somaliland.
 Waller's Gazelle, *Lithocranius Walleri*, ♂, Somaliland.
 Cheetal (Chittra), *Axis maculata*, ♂, old, Sonderbund.
Mr. A. H. Straker, Stagshaw House, Corbridge.
- Oct. 11. One pair Kudu Horns, *Strepsiceros Kudu*, Somaliland.
 „ Indian Antelope, *Antilope cervicapra*.
 1894. *Captain George Noble.*
- April 3. Red Kangaroo, *Macropus rufus*, Desm., Australia.
Mr. H. T. Mennell, Croydon.
- „ 11. Specimen of Fomart, *Mustela putorius*, trapped on the moors
 near Falstone, North Tyne. *Mr. A. Telfer, Falstone.*
- May 18. Nest or "Drey" of Squirrel, Bywell-on-Tyne. *Mr. H. T. Archer.*
 Field Vole, *Arvicola agrestis*, near Preston, North Shields.
Mr John Duncan.

BIRDS.

- 1893.
- July 1. Two French Finches.
 One Undulated Grass Parakeet, *Melopsittacus undulatus*, Australia.
 One Zebra Finch. *Mr. Robt. C. Clephan.*
- July 13. A Curlew, *Numenius arquatus*, coast of Northumberland.
Mr. J. Duncan.
- „ 20. Two specimens of the Golden Eagle from Scotland.
Mr. Bryan Cookson.
- „ 31. Black-headed Gull, *Larus ridibundus*, immature, Northumberland.
Mr. J. Duncan.
- Aug. 4. Nest and Eggs of the Corncrake taken in a grass field near
 Walker. *Mr. Hutchinson, Cut Bank, Ouseburn.*
- „ 4. Forty specimens of Birds (in spirits) from Terra del Fuego.
Mr. Ernest Hobbs.
- Sept. 12. Young Puffin, *Fratercula arctica*, caught in North Shields.
Mr. J. F. Spence, Chirton Cottage.
- „ 14. Richardson's Skua, *Stercorarius parasiticus*, ♂, juv.
 One Common Tern.
 One Arctic Tern. Whitley Sands. *Mr. J. Duncan.*
- „ 23. Gull, immature, ♀, and Purple Sandpiper, ♂, immature, Whitley
 Sands. *Mr. J. Duncan.*
- „ 5. Black-Cock, adult, ♂, changing from summer, shot near
 Elsdon, Sept. 1, 1893. *Mr. G. E. Crawhall.*

- Oct. 2. Kittiwake, immature, changing from first plumage to winter dress, Hartley Bates. *Mr. J. Duncan.*
- „ 14. Greater Black-backed Gull, *Larus marinus*, immature.
Black-headed Gull, *Larus ridibundus*, winter dress.
Richardson's Skua, *Lestris parasiticus*, mature.
- Nov. 20. Kittiwake, mature, winter plumage, St. Mary's Island. *Mr. J. Duncan.*
- „ 25. Little Auk, St. Mary's Island.
- „ 27. Cormorant, ♀, Seaton Sluice. *Mr. J. Duncan.*
- Dec. 2. Little Auk, found in a field near Darlington.
Three Leach's Petrel, caught on Marske Sands.
One Storm Petrel, found on „ „
One Iceland Gull, Howick Burn, Northumberland.
Two Razor Bills, winter dress, Oct., 1893.
One Little Auk, St. Mary's Island.
One Black Tern, winter dress, Redcar, Sept., 1892.
One Dunlin, changing from summer, Redcar, Sept., 1892.
1894. *In exchange per Curator.*
- Jan. 8. Brent Goose, *Bernicla brenta*, Pall., St. Mary's Island.
- „ 15. Eider Duck, ♂, juv., changing to summer „
Long-tailed Duck, changing from first to summer plumage.
Seaton Sluice. *Mr. J. Duncan.*
- „ 20. Java Sparrow (white variety). *Mrs. Dr. Page.*
- „ 22. Egg said to be Hybrid between Grouse and Barn-door Fowl? laid Jan., 1894, near Waskerley Reservoir. *Mr. J. Duncan.*
- Feb. 8. Bird's Nest enclosed in the centre of an Elm Tree, from the Tweed. Hole probably made at first by a Woodpecker, afterwards occupied by other birds as a nesting place. *Mr. Alfred Allhusen.*
- „ 23. Common Gull, *Larus canus*, ♂, winter plumage, St. Mary's Island.
Knot, *Tringa canutus*, ♂, mature, winter plumage, St. Mary's Island.
- Mar. 8. Common Guillemot, *Uria troile*, ♂, nearly full summer plumage.
Slavonian Grebe, ♂, St. Mary's Island. *Mr. J. Duncan.*
- April 3. Sparrow Hawk. *Mr. H. T. Archer.*
- „ 3. Emu, *Dromæus Novae-Hollandiæ*, Australia. *Mr. H. T. Mennell.*
- April 11. Goatsucker, *Caprimulgus Europæus*, ♀, Marske-by-the-Sea. *Per R. Howse.*
- „ 16. Common Guillemot, *Uria troile*, var. *ringvia*, St. Mary's Island.
- „ 27. Black-headed Gull, *Larus ridibundus*, near Stamfordham.
Hooded Crow, *Corvus cornix*, near Whitley. *Mr. J. Duncan.*

- May 12. Young Rook, with white primaries, nearly white bill and toes, shot near Sandhoe.

Mr. Chas. Liddell, Sandhoe High House.

- „ 12. Two Eggs of Song Thrush (very small) taken near Darlington.

Mr. J. Duncan.

- „ 14. Curlew's Nest with four Eggs, near Breckney Hill, Northumberland.

Mr. Latimer.

- „ 21. Nest of Golden Crest. *Prof. Somerville, B.A., F.R.S., Ed.*

- „ 23. Great Snipe, *Galinago major*, and Quail, *Coturnix vulgaris*, both shot near Newton, Corbridge, by Mr. James Harvey.

Miss Harvey, Rose Cottage.

- „ 29. Turnstone, *Streptilas interpres*, ♀, Northumberland Coast.

- June 1. Dunlin, *Pelidna cinclus*, ♂, St. Mary's Island.

- „ . Gannet, *Sula Bassana*, found near Cheviot.

*Mr. G. Charlton and Miss Turnbull, Harbottle,
per Rev. A. S. Wardroper, Alwinton.*

- „ . Skin of Mantell's Apteryx, *Apteryx Mantelli*.

Mr. G. Hastings, Warkworth House, Tynemouth.

1894.

REPTILES.

- Mar. 8. Three Skins of Snakes, two Pythons and one Puff Adder of the Colonists, and two Lizards from Natal, S. Africa.

Mr. Geo. Hardaker, Blomfontein, Orange States.

- April 5. Common Lizard, *Lacerta (Zootaca) venipara*, Croukley Scar, Teesdale.

Mr. J. Duncan.

- „ 21. Egyptian Mastigure, *Uromastix spinipes*, Egypt.

Mrs. W. F. Henderson.

- May 11. Snake's Skin, Australia.

Mr. G. Hastings, Warkworth House, Tynemouth.

- „ 18. Rattles of Rattle-Snake, North America. *Mr. Alex. Butters.*

- „ 21. Large Viper, ♀, Gibside, May, 1894.

Mr. Johnson, Burnopfield

1893.

FISHES.

- July 18. Specimen of the Rabbit Fish, *Chimaera monstrosa*, from the line-boat "Stanley," of North Shields, taken 150 miles from the Tyne.

Mr. Wm. Clift, South Shields.

- Sept. 12. Specimen of Burn Trout with malformed mouth, caught in the lake at Newton Hall, Felton, Northumberland.

Mr. John Short.

- „ 21. Three-bearded Rockling caught at Redcar. *Mr. H. T. Nelson.*

- Oct. 28. Three-bearded Rockling, caught off St. Mary's Island.
Greenland Bullhead, Whitley.
Cottus Bubalis,
Sordid Dragonet,
Lug or Lob-Worm, *Arenicola piscatorum*, Tynemouth and Cul-
lercoats.
Large specimen of *Filograna implexa*, from trawlers, North Sea.
Mr. Richd. Howse.
- Nov. 21. Specimen of the Torsk, *Brosmus vulgaris*, Flem., North Sea
Mr. W. Cumming, Gateshead.
- Dec. 23. Small specimen of the Pogge, *Cataphractus Schoneveldi*, St.
Mary's Island. Mr. J. Duncan.
- 1894.
- Feb. 12. Specimen of the Basse, *Labrax lupus*, Cuv., taken in a shrimp-
net in the Tyne a little above bridge.
Mr. W. Clift, South Shields.
Jaws of Shark, 14 feet in length, caught in Straits of Messina.
In exchange per Curator.
- April 27. Specimen of Pipe-Fish, *Nerophis æquoreus*, St. Mary's Island.
A Gunnel Fish and Greenland Bullhead, *Cottus Grælandicus*,
St. Mary's Island. Mr. J. Duncan.
- May 9. Specimen of *Scorpæna dactyloptera*, taken 12 miles off the mouth
of the Wansbeck.
Capt. Henry Whitfield, "Black Watch,"
per Mr. Ald. J. F. Spence.
- June 24. Specimen of the Ballan Wrasse, *Labrus maculatus*, taken off
Souter Point, coast of Durham.
Mr. W. Clift, South Shields.

MOLLUSCA.

- 1893.
- Dec. 2. Forbes' Cuttlefish, *Loligo Forbesii*, from trawlers, North Sea.
1894. Mr. F. H. Phillips.
- Jan. 22. A large specimen of *Ommastrephes todarus*, from the trawlers.
Mr. W. Clift, South Shields.
- April. . Two specimens of *Sepiola*, caught with the Whitebait, mouth of
the Thames Mr. F. H. Phillips.

INSECTS, ETC.

- 1893.
- July 1. Tick, from Tortoise, North Africa.
Mr. H. H. Fellows, Wimbledon.
- Aug. 9. Nest of Hornet from Canada. Master Basil Archer.
- Sept. 18. Nest of Tree Wasp, *Vespa Brittanica*, in Scotch Fir, Evestones,
Redesdale. Master G. Redesdale, Spain.

- Oct. 2. Parasite Worm from body of a Wasp. *Mr. J. Duncan.*
Nest with Trap-door of a large Spider, North America.

1894. *Mr. Alex. Butters.*

- Feb. . Corals, Meandrina, etc., from Bermuda.

In exchange per Curator.

- April 16. Emperor Moth, caught near Hexham. *Mr. J. Duncan.*

BOTANY.

1893.

- Sept. 12. Specimens of Dodder, *Cuscuta epithymum*, growing on *Erica cinerea* and *Ulex nana*, from Bournemouth. *Dr. Embleton.*

„ 25. Walking Stick made from Betel Nuts, the Fruit of the Palm Tree, *Areca catechu*, Lower Bengal.

1894. *Mr. Thos. Laidler, Seebpore, Howrah, India.*

- April 4. Two specimens of Foreign Fruit brought in ballast to Tyne Dock. *Mr. Hutchinson, Tyne Docks.*

- June 14. Two pieces of Wood found on the Pampas, used for firewood, Province of Tarapacà, Chili.

Mr. F. W. Anderson, Haldane Terrace.

FOSSILS AND MINERALS.

1893.

- Aug. 3. Specimen of Epsomite, Sulphate of Magnesia, S. of Spain.

Mr. M. J. Pelegrin.

- Aug. 19. 18 specimens of *Anthracosia Phaseola* and one *Anth. acuta* from Low-Main top-shale, Denton Colliery.

Mr. Geo. Young, Denton Colliery.

- Oct. . Specimen of *Stigmara* rootlets in Gannister from Bishop Auckland. *Mr. E. J. Garwood.*

- Nov. . Root of *Stigmara*, from shale above the Brockwell Seam, Duns-ton Pit; two pieces of Anthracitic Coal, and ripple-marked piece of Sandstone from same locality; and two pieces of Coal from the stem of *Sigillaria*, shewing pith.

Mr. N. Thompson, 35, Watson Street, Teams, Gateshead.

- Dec. 7. Specimen of a peculiar Hard Rock sunk through for foundation of new bridge at Barnard Castle.

1894

Mr. John A. Dotchin, Grey Street.

- Jan. 20. Diamantiferous Conglomerate from old mine (now exhausted) at Purtial, Kistna district, India.

Mr. J. P. Kirkup, Sunderland.

- Feb. 1. Auriferous, Quartz Conglomerate, "Banket." Upper weathered surface of the reef, $1\frac{1}{2}$ oz. of gold per ton, under portion of the reef carrying $2\frac{1}{4}$ oz. of gold per ton, Johannesburg, Transvaal.

Mr. M. T. Dixon, Brandling Park.

1894.

- Feb. . Collection of Fossil Fishes from the Marl-slate, Coal-measure, and Mountain Limestone (Yoredale and Lower Carboniferous Series) forming the Collection of the late Mr. William Dinning, Honorary Secretary for about 16 years of the Natural History Society.
- Marl-slate Fishes Northumberland and Durham.
Coal-measure Fishes Northumberland and Durham and Staffordshire.
Yoredale Rock Fishes Wensleydale and Richmond.
Lower Carboniferous Fishes, Calciferous Sandstone, Burdick House.
Sundries. *Bequeathed by the late Mr. Wm. Dinning.*
- April 4. Specimen of Cannel Coal from Australia. *Mr. Hutchinson.*
- May 10. Several Rock Specimens from Teesdale, Cullernose, etc. *Mr. E. J. Garwood.*
- „ 18. Fossil Teeth of Fishes (allied to *Cochliodus*) from Alton, Sub-Carboniferous, N. America. *Mr. Alex. Butters.*
- „ 30. Cast of *Stigmaria* in Sandstone and tracks of Crustaceans, Millstone Grit Series, Edmondbyers. *Rev. W. Featherstonehaugh.*
- June 1. Specimens of Borate of Lime (crude), Sulphur (crude). Silver and Copper Ore (*Stromeyerite*). Sulphate of Alumina and Magnesia (*Pickeringite*) from Iquique, Province of Tarapacá, Chili. *Mr. F. W. Andersen, Haldane Terrace.*

1893.

ETHNOLOGY.

- July 3. Mummy Crocodile from Egypt. *The Executors of the late Rev. Dr. and Mrs. Bruce.*
- „ 12. A pair of leather Hunting Breeches about 100 years old. *Mr. Thos. Thompson, Winlaton House.*
- 1894.
- Jan. 23. Three Arrow Heads in silex: one white, two dark; and one Flint Flake from Bufflesdown, Klerksdrop district, Transvaal, 75 miles S. of Johannesburg. *Mr. M. T. Dixon, Brandling Park.*
- Feb. 2. A Water Jug and a Water Bottle from Portugal.
- „ „ Three Bandarellos used in the Bull Fights in Spain. *Mr. M. T. Dixon, Brandling Park.*
- Mar. 8. Four Assegais: two Matabele, two Zulu, South Africa. *Mr. Geo. Hardaker, Bloemfontein.*
- June 1. Mummified Arm of Indian, with covering of Birds' Feathers, from Province of Tarapacá, Iquique, Chili. *Mr. F. W. Andersen, Haldane Terrace.*
- „ 5. Two Slabs, "Stellæ," with three figures on each, from Egypt. *Mr. Thos. Carrick Watson.*

IV.—*Catalogue of the Spiders (Araneidea) of Northumberland and Durham.* By the Rev. JOHN E. HULL, M.A., North Shields.

THE basis of the Catalogue here given is the work of Mr. James Hardy of Old Cambus, Berwickshire, which is embodied in a paper contained in the Proceedings of the Berwickshire Naturalists' Field Club (vol. VII., pp. 307–323). It is entitled, "*List of Araneidea and Phalangeidea, collected from October, 1871, to October, 1874, in Berwickshire and Northumberland, by Mr. James Hardy. By the Rev. O. P. Cambridge, M.A., C.M.Z.S.*" One hundred and forty-three species are recorded for Northumberland, all from the neighbourhood of Cheviot Hill and Wooler; and of these no less than fourteen were new to science, and two new to the British list. The number of species for Northumberland and Durham is here increased to 192, of which one appears to be hitherto undescribed.

For purposes of reference and comparison, a chronological bibliography of the *Araneidea* of the North of England and the Scottish Lowlands is appended:—

1858. MR. JAMES HARDY. Berwickshire.

"*A List of Berwickshire Spiders.*" Proc. Berw. Nat. Club, vol. V., pp. 92–96. Seventy species are recorded.

1860. DR. R. H. MEADE. Durham.

An account of the habits of *Porrhomma microphthalmum* (*Nerienne errans*) and its capture in a coal-pit at Pelton. "Zoologist," August, 1860, No. CCXIX.

1861. P. D. MORRISON. Pelton Colliery, Durham.

On a Spider (*Nerienne errans*) inhabiting Coal-mines. Trans. Tyneside Nat. Field Club, vol. V., p. 49.

1861–62. REV. O. P. CAMBRIDGE. Scotland.

"*Sketch of an Arachnological Tour in Scotland in 1861, with List of Scotch Spiders.*" "Zoologist," pp. 8041–8051. (1862). The list was afterwards republished in the "Entomologist," 1877.

1875. Rev. O. P. CAMBRIDGE. Northumberland, Berwickshire.
This is the list of Berwickshire and Northumberland Spiders already referred to. 75 species are recorded for Berwickshire and 143 for North Northumberland.
1894. Messrs. G. H. CARPENTER and W. EVANS. Edinburgh.
"*A List of Spiders (Araneidea) collected in the neighbourhood of Edinburgh.*" Proc. Royal Phys. Soc. of Edinburgh, vol. XII., pp. 527-590, with appendix and plate.
1895. Mr. F. O. PICKARD-CAMBRIDGE. Cumberland and Lake District.
"*A List of the Araneidea of Cumberland and the Lake District.*" "*Naturalist*," Jan., 1895, pp. 29-48. 187 species are enumerated.

In addition to these local lists, various species are recorded from definite localities in the North of England and the South of Scotland, in the following works on British Spiders:—

- 1861-64. Mr. J. BLACKWALL. British Isles.
"*Spiders of Great Britain and Ireland.*" Ray Soc.
Two vols. With coloured plates of 273 species.
- 1879-82. Rev. O. P. CAMBRIDGE. British Isles.
"*Spiders of Dorset.*" Proc. of the Dorsetshire Nat. Hist. Soc. Two vols. Six plates. Descriptions of all British species then known are given, 518 in all.

The chief intent of this present list of Northumberland and Durham Spiders is to indicate how much remains to be done. There is a wide and finely varied field in the two counties which has been worked only in isolated spots, and that but imperfectly. No one locality has been collected over throughout the year; and when it is remembered that the various species come to maturity at different seasons, varying from early spring to late autumn, the defective nature of the list from this cause alone will be obvious.

The incompleteness of our records may also be demonstrated from comparison with other lists. Some 540 British species have been recorded up to the present time. If climatic and

other influences be supposed to affect Spiders and phanerogamous plants in the same degree, we ought to have at least 300 species native to the two counties. We can put on record only 192. The county of Dorset can boast of 350. Again, for Cumberland and the Lake District, Mr. F. O. Pickard-Cambridge records 187 species, of which no less than 47 have not yet been taken on our side of the Pennines; while of 105 Berwickshire Spiders taken by Mr. Hardy, eleven have not been taken in Northumberland or Durham.

In my own collecting expeditions I have tried to make the localities visited as widely representative as possible, but circumstances narrowed both time and space. Weardale was most accessible, and collections were made in the neighbourhood of Wolsingham and around Durham. In Tynedale the chosen localities were Bardon Mill, Newburn, and the upper Team Valley. Spiders were also received from Newcastle (Jesmond). One autumn visit was paid to Morpeth and two spring visits to Upper Teesdale. Such Spiders as I have from the coast region were taken at Ryhope, Whitley, and Holywell Dene.

Diligent collecting cannot fail to swell our list very considerably. Bogs, swamps, and mosses, wherever they occur, will repay careful search. The Heather and Furze of our moors form such shelter as Spiders love; in summer time they are never beaten in vain. I have never had an opportunity of collecting in our upland mosses; and it is worthy of note that of the 47 species recorded for the Lake District, and not yet taken in Northumberland and Durham, 13 were found in Newtown Moss near Penrith. Mr. Hardy found Cold Martin Moss equally fruitful. It may be, therefore, that presently Newham Bog and Muckle Moss will be found to be as rich in rare Spiders as they are in rare plants.

The highest level at which I have collected is 1600 feet, on Widdy Bank Fell. This was in early April, 1895, in sunny weather, though the snow still lingered on the hills. Under stones at that height were found *Celotes atropos*, *Amaurobius fenestralis*, *Trochosa terricola*, and *Xysticus cristatus*. On the sunny slopes, scarcely free from their burden of snow, swarms

of *Tarentula pulverulenta*, *Lycosa amentata*, *L. nigriceps* and *L. pullata* scampered hither and thither, none of them yet adult. From the loose herbage on the rocks, which look southward over the Tees, we beat out *Meta segmentata*, *M. merianae*, *Ero furcata*, and *Neon reticulatus*. All these Spiders, however, appear to be generally distributed throughout the two counties down to the very coast. I have taken all except *Cælotes atropos* and *Lycosa pullata* either at Ryhope or Whitley. Indeed, of the Spiders enumerated below, very few can be said to be of a boreal type or restricted in their range to sub-alpine districts. Among them may be mentioned *Bolyphantes alticeps*, *Lepthyphantes angulata*, *Micryphantes sublimis*, *Tmeticus adipatus*, and *Plaesiocraerus alpinus*. On the Continent these appear to be peculiar to the hill districts, but I have taken the first-named in the woods below Morpeth. The rest are Cheviot Spiders, except *Plaesiocraerus alpinus*, which was taken in upper Teesdale at 1300 feet.

The total number of species here enumerated is 192. Of the 143 species in the Cheviot list of 1875, additional records are here given for 91; the remaining 52 have not since been taken within our area. My own collections supply 44 new records (including one species new to science); another is in the Museum of the Natural History Society (*Tegenaria atrica*); the rest are from other records.

Of the fourteen species new to science in the Cheviot list, eight have not, so far as I know, been found elsewhere in the British Islands; though one of the eight—*Centromerus (Linyphia) arcanus*—has since been taken on the Continent.

Of the Spiders here enumerated the most noteworthy are *Tapinopa unicolor*, *Hilaira uncata*, *Micryphantes sublimis*, *Nerienne (?) curtipes*, *Cornicularia clara*, *C. (?) pudens*, *C. (?) pavitans*, *Tmeticus abnormis*, *Tm. adipatus*, *Centromerus prudens*, *Porrhomma (?) contritum*, *Centromerus arcanus*, *Nerienne (?) morula*, *Wideria nodosa*, all new species discovered in the Cheviot neighbourhood by James Hardy. To these may be added *Pedina scopiger* and *Lepthyphantes angulatus*, also in the Cheviot list and at that time new to Britain.

Other rare Spiders included in that remarkable list are *Prosthesima Petiverii*, *P. nigrita*, *Pholcomma gibbum*, *Tmeticus Huthwaitii*, *Xysticus viaticus*, *X. erraticus*, and *Trochosa cinerea*.

Of the species now added, *Tmeticus denticulatus*, n. sp., *Cryphoeca diversa* (second occurrence), and *Oxyptila flexa* (second occurrence), are the most noticeable; but the following are also rare: *Micryphantes corniger*, *Plaesiocraerus alpinus*, *Cicurina cinerea*, *Tegenaria atrica*, *Lepthyphantes flavipes*, *Euryopis Blackwallii*, *Hasarius Adansonii*, and *Theridion tepidariorum*.

ABBREVIATIONS OF AUTHORS' NAMES USED IN THE FOLLOWING
CATALOGUE.

CHRONOLOGICAL LIST.

- Clk.—Clerck: *Svenska Spindlar*, 1757; the first application of the Linnæan binominal nomenclature to Spiders.
- L.—Linnæus: *Fauna Suecica*, 1758.
- Scop.—Scopoli: *Entomologia Carniolica*, 1763.
- Strøm—Strøm: *Beskrivelser over Norske Insekter*, 1765 (in *Det Trondhiemske Selskabs Skrifter*).
- Fabr.—Fabricius: *Syst. Nat.*, 1775; *Entomologia Systematica*, 1793.
- De G.—De Geer: *Mémoires pour servir à l'histoire des Insectes*, 1778.
- Oliv.—Olivier: *Encycl. Method.*, 1789 (?).
- Vill.—Villers: *Linn. Entom.*, 1789.
- Panz.—Panzer: *Faun. Ins Germ.*, 1797; *Syst. Nomencl.*, 1804.
- Walck.—Walckenaer: *Faune Paris.*, 1802; *Tabled. Aran.*, 1805; *Hist. Nat. d. Aran.*, 1807; *Hist. Nat. d. Ins. Apt.*, 1837–47.
- Latr.—Latreille: *Hist. Nat. d. Crust. et d. Ins.*, 1804; *Gen. Crust. et Ins.*, 1806.
- Sund.—Sundevall: *Svenska Spind. Beskr.*, 1832 (in *Vet. Akad. Handl.*).
- C. L. K.—C. L. Koch: *Deutsch. Ins.*, 1833–36; *Die Arachn.*, 1839–45.

- Hahn—Hahn: *Die Arachn.*, 1834.
- Bl.—Blackwall: Various Papers, 1833–70; *Spiders of Great Britain and Ireland*, 1861–64.
- Wid.—Wider: *Arachn.*, in *Zool. Misc.* (Reuss.), 1834.
- Sav. et Aud.—Savigny et Audouin: *Descr. de l’Egypte*, 1825–7.
- Westr.—Westring: *Araneae Suecicae*, 1861.
- Thor.—Thorell: *Recens. Crit. Aran.*, 1856; *On European Spiders*, 1869; *Remarks on Syn. Eur. Spid.*, 1870–72.
- Ohl.—Ohlert: *Die Aran. d. Provinz Preussen*, 1867.
- Menge—Menge: *Preussische Spinnen*, 1866–74.
- L.K.—Dr. Louis Koch: *Die Arachn.-fam. d. Drassiden*, 1866.
- Sim.—Eugène Simon: *L’Histoire Naturelle des Araignées*, 1864; *Les Arachnides de France*, 1874–84.
- Hentz—Hentz, N. M.: *Spiders of the United States*, 1875.
- Cb.—Cambridge: *Spiders of Dorset*, 1879–82; and various Papers, quoted below.
- Emerton—Emerton, T. H.: *Trans. Conn. Acad.*, vol. II.
- Bertk.—Bertkau: *Spinnenfauna d. Rheinprov.*, 1883.
- Dahl—Dahl (1886).
- Kulcz.—Kulczynski: *Araneae Hungariae*, 1892–94.

NOTE.—The classification and nomenclature here adopted is drawn from Dr. T. Thorell (*Remarks on Synonyms of European Spiders*), M. Eugène Simon (*Les Arachnides de France*), and Prof. W. Kulczynski (*Araneae Hungariae*). To students of Spiders the last-named will be found particularly useful. For the study of British Spiders, Blackwall’s *Spiders of Great Britain and Ireland* is indispensable, while Cambridge’s *Spiders of Dorset* is an almost necessary supplement.

CATALOGUE.

N. Indicates localities in the Counties of Northumberland and Newcastle-upon-Tyne. D. in the County of Durham.

SUB-KINGDOM. ARTHROPODA.

CLASS. ARACHNIDA.

Order. ARANEIDEA.

FAMILY I. DICTYNIDAE (5 species).

GENUS. DICTYNA, Sund.

Dictyna arundinacea, (L.).

Aranea arundinacea, Linn. Syst. Nat., ed. 10, vol. I., p. 620.

Ergatis benigna, Blackwall. Spiders of Great Britain and Ireland, p. 146, pl. IX., fig. 93.

N. Wooler, Bardon Mill. D. Durham, Wolsingham, Ryhope, Though this is by no means a rare Spider, I have seen adults at the last named place only, in Sept., 1895. It is fond of Furze.

Dictyna uncinata, Westr.

Ergatis arborea, Cambridge. Zoologist (1862), p. 7960.

Dictyna uncinata, Menge. Preuss. Spinn., vol. III., pl.

XLVII., tab. 144.

D. Durham, Wolsingham. Much more plentiful than the preceding where found at all. It haunts low shrubs, and I have found it particularly fond of garden Box. The female may be found at the extremities of the shoots guarding her cocoon in May and June.

AMAUROBIUS, C. L. K.

Amaurobius fenestralis, (Strøm).

Ciniflo atrox, Blackwall. *Op. cit.*, p. 140, pl. IX., fig. 88.

Amaurobius fenestralis, Pickard-Cambridge, F. O. Ann. and Mag. Nat. Hist., S. 6, vol. X., p. 389, pl. XXI., fig. 11.

N. Langleyford, Wooler, Bardon Mill, Whitley. D. Durham,

Teesdale, Wolsingham Common under stones throughout the year. May be found at any time clinging to the under surfaces of loose stones, especially in woods and on the moors. Along with it, in March and April, may be found *Cælotes atropos* (in its silken sac), *Bathyphantes concolor*, and *B. nigrinus*, all adult; sometimes also *Segestria senoculata*, in a silken sac, adult; and occasionally *Linyphia montana* and *Lycosa amentata*, immature. In such company, and in the same months I have taken immature specimens of the rare *Cicurina cinerea* and the rarer *Cryphoea diversa*.

Amaurobius similis, (Bl.).

Ciniflo similis, Blackwall. *Op. cit.*, p. 141, pl. IX., fig. 89.

Amaurobius similis, Pickard-Cambridge, F.O. Ann. and Mag. Nat. Hist., S. 6, vol. X., p. 389, pl. XXI., fig. 10.

N. Jesmond Dene, Newburn, Whitley, Morpeth. D. Durham, Teesdale. A very common Spider, nocturnal in its habits; to be found by day in crevices of walls, rocks, and banks, its retreat usually indicated by outer works of coarse, flocculent web, apparently formless. Very like the preceding species but rather larger. The figures of Mr. F. O. Pickard-Cambridge quoted will serve to distinguish the two.

Amaurobius ferox, (Walck.).

Ciniflo ferox, Blackwall. *Op. cit.*, p. 142, pl. IX., fig. 90.

N. Percy Main. D. Durham, Birtley. Not so common as *A. similis*; of similar habit, but more usually to be found within buildings.

FAMILY II. DYSDERIDAE (3 species).

HARPACTES, Temp.

Harpactes Hombergii, (Scop.).

Dysdera Hombergii, Bl. *Op. cit.*, p. 371, pl. XXVIII., fig. 268.

D. Durham, Kepier Wood and Pelaw Wood, Teesdale, Falcon Clints, Harperley, near Wolsingham. Among matted grass on banks and cliffs; not common.

SEGESTRIA, Latr.

Segestria senoculata, (L.).

Segestria senoculata, Bl. *Op. cit.*, p. 374, pl. XXVIII., fig. 270.

N. Wooler and Old Earle, Bardon Mill. D. Durham, Teesdale, Wolsingham, Ryhope. A common Spider, spinning up in a silken sac for the winter, in walls, crevices of rocks, and under loose bark of trees.

OONOPS, Temp.

Oonops pulcher, Temp.

Oonops pulcher, Bl. *Op. cit.*, p. 377, pl. XXIX., fig. 271.

D. Durham, Pelaw Wood and Kepier Wood. Blackwall (*op. cit. suprâ*) records it from Northumberland. Not common. I have usually beaten it from overhanging grass on dry, sunny banks.

FAMILY III. DRASSIDAE (14 species).

MICARIA, Westr.

Micaria pulicaria, (Sund.).

Clubiona pulicaria, Sund. Sv. Spindl. Beskr. f. 1831, p. 140.

Drassus micans, Blackwall. *Op. cit.*, p. 118, pl. VI., fig. 72.

„ *nitens*, „ „ p. 119, pl. VI., fig. 73.

N. Wooler, adult male and female. D. Durham, one adult male among loose rubbish in a hedge-row near Shincliffe Mill. Apparently rare. Beetle-like in appearance, with prismatic hues.

PROSTHESIMA, C. L. K.

Prosthesima Petiverii, (Scop.).

Aranea Petiverii, Scop. Ent. Carn., p. 398 (*salt. ad part.*).

Drassus ater, Blackwall. *Op. cit.*, p. 106, pl. VI., fig. 63.

N. Wooler, an immature male.

Prosthesima nigrita, (Fabr.).

Drassus pusillus, Blackwall. *Op. cit.*, p. 107, pl. VI., fig. 64.

N. Top of Cheviot, an adult female; Wooler, an immature female.

DRASSUS, (Walck.).**Drassus troglodytes, C. L. K.**

Drassus troglodytes. C. L. K. Die Arachn. VI, p. 35, taf. CLXXXIX., figg. 455, 456.

Drassus clavator, Cb., Blackwall. *Op. cit.*, p. 109, pl. VI., fig. 66.

N. Cold Martin Moss and top of Cheviot, Bardon Mill. It seems to be confined to the fell country, where it may be found under stones. I took adults in September.

Drassus lapidicola, (Walck.).

Drassus lapidicolens, Blackwall. *Op. cit.*, p. 116, pl. VI., fig. 70.

N. Cheviot Hill, Wooler, Old Earle, Holywell Dene. D. Ryhope. An adult female taken at Ryhope, among furze on the cliff top, has a strong conical apophysis on the inner side of the radial joint of the right palpus. This species would seem to be more abundant in the hills than elsewhere. "Found in profusion throughout Cumberland and the Lake District, beneath stones on the fell sides and mountain slopes." (F. O. Pickard-Cambridge: *Araneidea of Cumb. and Lake Dist.*). Adult from May onwards.

CLUBIONA, (Latr.).**Clubiona grisea, L. K.**

Clubiona grisea, L. K. Die Arachn.-fam. de Drass., p. 319, taf. XIII., figg. 205-207.

Clubiona holosericea, Blackwall. *Op. cit.*, p. 122, pl. VII., fig. 75.

Wooler and Cold Martin Moss; both sexes, adult and immature.

Clubiona terrestris, Westr.

Clubiona terrestris, Westr. Förteckn., etc., p. 49.

Clubiona amarantha, Blackwall. *Op. cit.*, p. 123, pl. VII., fig. 75.

N. Wooler, both sexes, adult. D. Durham, Ryhope. In the summer the female may be found in a silken sac under or between leaves of low shrubs (especially Brambles) with her cocoon. At that season the male is difficult to find, but is more frequently met with in April and May among grass and low herbage.

Clubiona reclusa, Cb.

Clubiona reclusa, Cambridge. Trans. Linn. Soc., vol. XXVIII.,
tab. 33, fig. 3.

N. Wooler, adults, male and female. D. Durham. I have taken the male only in the Durham woods. The female may readily be distinguished from its known congeners by some fine marbling on the cephalothorax. Habits similar to those of the foregoing. In the Midlands I have taken the female with her cocoon between two leaves (Laurel, Meadow-sweet, Ash) spun together.

Clubiona lutescens, Westr.

Clubiona assimolata, Cambridge. Zoologist (1862), p. 7953.
„ *lutescens*, Koch. Die Arachn.-fam. d. Drassiden,
p. 36, Taf. XIII., figs. 217-219.

D. Durham. Pretty plentiful in the woods at Durham. I have not noticed it elsewhere in our two counties, but found it tolerably abundant in Leicestershire. Adult males may be found roaming about in April; females are more frequent later. The latter very much resemble the females of the three preceding species. I have taken male and female *in copula* in May.

Clubiona pallidula, (Clk.).

Aranea pallidula, Clk. Sv. Spindl., p. 81, pl. II., tab. 7.
Clubiona epimelas, Blackwall. *Op. cit.*, p. 124, pl. VII., fig. 77.

N. Wooler, an adult male. D. Durham, a few females, with cocoons, in July.

Clubiona compta, C. L. K.

Clubiona compta, Blackwall. *Op. cit.*, p. 128, pl. VII., fig. 81.

N. Wooler, Morpeth, Bardon Mill. D. Durham, Teesdale, Wolsingham. One of the commonest of the genus, and the prettiest. Blackwall's figure may be somewhat misleading to a beginner. All the adults I have seen present red-brown bars on a yellowish ground; not *vice versa*. Habits and time of maturity

as in other species of this genus. The female usually spins up late in June under a Bramble leaf. I believe I have never seen it on any other shrub.

Clubiona trivialis, C. L. K.

Clubiona trivialis, Cambridge. Zoologist (1862), vol. XX., p. 7947.

„ „ Koch. Die Arachn.-fam. d. Drassiden, p. 305.
Taf. XII., figs. 194-196.

Wooler, adult male. I am not acquainted with this Spider.

Clubiona pallens, C. L. K.

Clubiona pallens, Blackwell. *Op. cit.*, p. 130, pl. VIII., fig. 82.

N. Wooler, adult females; Cheviot Hill, adult male. A rare Spider. I have beaten it from Furze in the Midlands. Adult in July.

ZORA, C. L. K.

Zora maculata, (Bl.).

Hecavæge maculata, Bl. Lond. and Edinb. Phil. Mag., 3 Ser.,
vol. III., p. 193.

„ *spinimana*, Westr., Blackwall. *Op. cit.*, p. 41, pl.
III., fig. 21.

D. Urpeth; at the roots of grass on a damp, shady bank. The arrangement of the eyes in this genus approaches that of *Dolomedes*, which led Blackwall to include it among the Lycosidae. Within our area I have met with one immature female only. It is common in the Eden Valley (*Aran. Cumb. and L. D.*).

FAMILY IV. AGELENIDAE (8 species).

CRYPHOECA, Thor.

Cryphoea silvicola, (C. L. K.).

Tegenaria silvicola, Bl. *Op. cit.*, p. 168, pl. XII., fig. 108.

N. From all the localities in the Wooler district; near Bardon Mill, on Heather. D. Teesdale, in the fell walls; near Wolsingham, beaten from Furze. I have not seen it except in the hill districts. Common throughout Cumberland,

Cryphoea diversa, Cb.

Cryphoea diversa, Cambridge. Proc. Dor. Nat. Hist. Soc., 1892.

D. An immature female was taken in Pelaw Wood, Durham, under a stone in the spring of 1893. This was the second occurrence of the Spider. An adult female was taken by Mr. F. O. Pickard-Cambridge, running on a rail in the sunshine, on the banks of the Caldey, on Oct. 11th, 1892, near Carlisle.

COELOTES, Bl.**Coelotes atropos**, (Walck).

Drassus atropos, Walck. Faune Franc., Arachn., p. 170
(femina).

Coelotes saxatilis, Blackwall. *Op. cit.*, p. 169, pl. XII., fig. 109.

N. Cheviot Hill, adult and immature females; Bardon Mill, Morpeth. D. Durham, Teesdale, Wolsingham. Very common under stones on the fells and in woods all the year round. Adult males are most frequently met with in the spring; for the rest of the year adult females are perhaps ten times as numerous as the males. A large Spider, and swift in its movements.

TEGENARIA, Latr.**Tegenaria Derhamii**, (Scop.).

Aranea Derhamii, Scop. Ent. Carn., p. 400.

Tegenaria civilis, Blackwall. *Op. cit.*, p. 166, pl. XII., fig. 107.

N. Wooler, immature females. The common house Spider, to be seen in the unswept angles of buildings everywhere.

Tegenaria atrica, C. L. K.

Tegenaria atrica, Blackwall, *Op. cit.*, p. 165, pl. XI., fig. 106.

N. An adult male from Jesmond (Nov., 1887) is in the Museum of the Natural History Society. D. An immature female was also received from Winlaton. One of our largest British Spiders. Its habits are those of the preceding species.

CICURINA, Menge.

Cicurina cinerea, (Panz.).

Tegenaria cinerea, Cambridge. Spiders of Dorset, vol. I., p. 55.

Cicurina cicur, Menge. Preuss. Spinn., p. 272, pl. L., fig. 150.

D. An immature male of this rare Spider was taken by myself in Kepier Wood, Durham, under a stone, in May, 1895. N. In the following October I came upon a small colony in a disused quarry in Holywell Dene. There were several adult females, but no adult males.

TEXTRIX, Sund.

Textrix denticulata, (Oliv.).

Aranea denticulata, Oliv. Encycl. Méth., vol. IV., p. 213.

Textrix lycosina, Blackwall. *Op. cit.*, p. 172, pl. XII., fig. 110.

N. Wooler. D. At Durham it is common in inhabited houses and greenhouses; at Tynemouth, under stones in December, spun up in a silken sac. It constructs a fine web of the form typical of this family, that is, a strongly woven horizontal snare narrowed at one corner into a tubular retreat. A Spider of graceful form and exceedingly rapid movements. An attempt to take it alive generally involves considerable excitement. Adult in summer.

HAHNIA, (C. L. K.).

Hahnia elegans, Bl.

Agelena elegans, Blackwall. *Op. cit.*, p. 155, pl. X., fig. 99.

N. Cold Martin Moss, an adult female. D. Durham, immature examples of both sexes in a boggy place in Pelaw Wood. Apparently not common. A hygrophilous species haunting the roots of herbage in bogs.

FAMILY V. THERIDIIDAE (117 species).

ERO, (C. L. K.).

Ero furcata, (Vill.).

Aranea furcata, Vill. Linn. Entom.

Theridion variegatum, Bl. *Op. cit.*, p. 203, pl. XIV., fig. 134.

N. Wooler, adult females; Cold Martin Moss, adult males; Bardon Mill, Morpeth, Whitley. D. Durham, Wolsingham, Teesdale, Ryhope. Widespread but few in number. Chiefly among thick grass. Beaten from Heather on Falcon Clints (about 1400 feet) and from *Ononis* at Whitley.

PHOLCOMMA, Thor.

Pholcomma gibbum, (Westr.).

Pholcomma gibbum, Cambridge. Trans. Linn. Soc., vol. XXVIII.,
p. 445, tab. 33, fig. 8.

N. Wooler and Cheviot. A curious and rare little Spider. Apparently rarer in the South of England than in the North. [Cumberland, not common. *Aran. Cumb. and Lake Dist.*].

NESTICUS, Thor.

Nesticus cellulanus, (Clk.).

Araneus cellulanus, Clk. Sv. Spindl., p. 62, pl. IV., tab. 12.
Linyphia crypticolens, Bl. *Op. cit.*, p. 224, pl. XVI., fig. 149.

D. Durham, Teesdale. Two adults (June) at the former, one immature male (April) at the latter locality. A scotophilous (gloom-loving) species; probably not so rare as it appears to be from its habit of close concealment.

THERIDION, (Walck.).

Theridion tepidariorum, C. L. K.

Theridion tepidariorum, Bl. *Op. cit.*, p. 180, pl. XIII., fig. 114.

N. Jesmond, from greenhouses. Found in conservatories and like places in various parts of the kingdom; scarcely, if ever, met with in the open air, even on the Continent. [“Abundant in greenhouses at Carlisle and Dalston.” *Aran. Cumb. and Lake District*].

Theridion pictum, Walck.

Theridion pictum, Blackwall. *Op. cit.*, p. 184, pl. XIII., fig. 117.

D. Durham, Teesdale, Wolsingham. N. Newburn. On shrubs

where there is plenty of sunshine—especially in gardens. The snare is a mass of apparently irregular filaments, crossing each other without order, but still uniformly disposed. At or near the top is the nest, a dome or bell-shaped retreat, usually under a leaf or some like shelter. Within this, at the end of July, the female may be found guarding her one or two greenish, globular cocoons.

***Theridion sisypium*, (Clk.).**

Aranens sisypius, Clk. Sv. Spindl., p. 54, pl. III., tab. 5.

Theridion nervosum, Bl. *Op. cit.*, p. 183, pl. XIII., fig. 116.

N. Wooler and elsewhere in North Northumberland, Bardon Mill, Newburn, Morpeth. D. Durham, Wolsingham, Ryhope. Habit of the preceding. Nest somewhat shallower, with a wider mouth.

***Theridion denticulatum*, Walck.**

Theridion denticulatum, Bl. *Op. cit.*, p. 185, pl. XIII., fig. 118.

N. Wooler. D. Durham, Wolsingham. On shrubs and tree-trunks. Adult in summer.

***Theridion varians*, Hahn.**

Theridion varians, Blackwall. *Op. cit.*, p. 128, pl. XIV., fig. 120.

D. Durham, Wolsingham, Ryhope. On shrubs, trees, and palings. Particularly fond of the last-named in the neighbourhood of gardens and shrubberies. Adult in summer. Fairly plentiful.

***Theridion pallens*, Bl.**

Theridion pallens, Blackwall. *Op. cit.*, p. 194, pl. XIV., fig. 125.

„ „ Cambridge. Spiders of Dorset, vol. 1, p. 92,
pl. II., fig. 8.

N. Wooler, one adult male. D. Durham, Wolsingham, Urpeth. On shrubs and trees, but it is a very small Spider, easily overlooked. In July the female may be found with her cocoon on

the upper, concave side of a leaf (of an Apple-tree, for instance). The egg-cocoon is a small white irregular pyramid, with small lateral projections, pointing upwards. It is attached by its base to the upper side of the leaf, not by its apex to the under side as figured in "Spiders of Dorset."

Theridion lineatum, Clk.

Theridion lineatum, Blackwall. *Op. cit.*, p. 176, pl. XIII., fig. 3.

N. Wooler district. Abundant everywhere on shrubs and among low herbage. Commonest of the genus and most conspicuous, being large, of a pale green hue with (usually) bright crimson markings on the abdomen. Egg-cocoon greenish, guarded by the female within a folded leaf in July and August.

STEATODA, (Sund).

Steatoda bipunctata, (L.).

Aranea bipunctata, Linn. *Syst. Nat.* Ed. 10, vol. I., p. 260.

Theridion quadripunctatum, Blackwall. *Op. cit.*, p. 177, pl.

XIII, fig. 112.

D. Durham, Teesdale. N. Jesmond. Apparently plentiful everywhere in buildings, in crevices, and under projecting ledges. Abdomen flattened, of a chocolate colour, usually (in the case of the female) with a longitudinal pale bar, and a band of the same colour around the fore extremity.

EURYOPIS, (Menge).

Euryopsis Blackwallii, (Cb.).

Theridion Blackwallii, Cambridge. *Trans. Linn. Soc.*,
vol. XVII., p. 419, tab. 55, fig. 16.

D. Durham, Shincliffe Wood. One adult female only. A rare Spider.

PEDANOSTETHUS, Sim.

Pedanostethus lividus, (Bl.).

Neriene livida, Blackwall. *Op. cit.*, p. 252, pl. XXVII., fig. 169.

„ „ Cambridge. *Trans. Linn. Soc.*, vol. XXVII.,
tab. 56, fig. 31, f. g. h.

N. Wooler district, Bardon Mill, Morpeth, Whitley, Newburn.
D. Durham, Teesdale. Under stones in damp places, common.
Adult in summer.

TAPINOPA, Westr.

Tapinopa longidens, (Bl.).

Linyphia longidens, Bl. *Op. cit.*, p. 227, pl. XVII., fig. 150.

N. Cheviot Hill, one adult female; Newburn, Holywell Dene.
D. Urpeth, adult females only, August to October. This Spider
weaves a web of very firm texture under stones.

Tapinopa unicolor, Cb.

Tapinopa unicolor, Cambridge. *Proc. Berw. Nat. Club* (1874),
vol. VII., p. 317.

N. Wooler. One of Mr. Hardy's additions to Science. It has
not been found elsewhere.

FLORONIA, Sim.

Floronia frenata, (Clk.).

Linyphia frenata, Blackwall. *Op. cit.*, p. 228, pl. XVI., fig. 151.

N. South Middleton Dean, an adult female. A very fine species,
which I have not myself seen within the two counties. It is adult
in September, and may be found among grass in damp places.

BOLYPHANTES, (C. L. K.).

Bolyphantes alticeps, (Sund.).

Linyphia alticeps, Menge. *Preuss. Spinn.*, p. 134, pl. XXV.,
fig. 55.

N. Cheviot Hill, both sexes; Morpeth, an adult male in Bothal
Woods in October.

Bolyphantes luteolus, (Bl.).

Linyphia luteola, Bl. *Lond. and Edinb. Phil. Mag.*, 3 Ser.,
vol. III., p. 192.

Linyphia alticeps, Blackwall. *Op. cit.*, p. 226, pl. XVI., fig. 149.

N. Langleyford, Cheviot Hill, Bardon Mill, Newburn, Whitley, Holywell Dene, Morpeth. D. Durham. Abundant among grass. Adult in autumn. This species and the preceding resemble young examples of *Stemonyphantes lineatus* very closely.

DRAPETISCA, Menge.

Drapetisca socialis, (Sund.).

Linyphia socialis, Blackwall. *Op. cit.*, p. 222, pl. XVI., fig. 147.

D. Wooler, South Middleton Dean; Morpeth, on rocks in the woods, plentiful. Adult in October. Also at Durham in the summer, immature examples.

STEMONYPHANTES, Menge.

Stemonyphantes lineatus, (L.).

Aranea lineata, Linn. Syst. Nat. Ed. 10, vol. I., p. 620.

Neriere trilineata, Blackwall. *Op. cit.*, p. 279, pl. XIX., fig. 193.

N. Wooler district. Very common everywhere among grass and at the roots of hedges, especially in spring and early summer. Adult in May.

LINYPHIA, (Latr.).

Linyphia montana, (Clk.).

Araneus montanus, Clk. Sv. Spindl., p. 64, pl. III., tab. 1.

Linyphia marginata, Blackwall. *Op. cit.*, p. 213, pl. XV., fig. 140.

N. Wooler district, South Middleton Dean. N. and D. One of our commonest Spiders in hedges, shrubs, angles of buildings and elsewhere. Adult in summer.

Linyphia triangularis, (Clk.).

Araneus triangularis, Clk. Sv. Spindl., p. 71, pl. III., tab. 2,
fig. 1 (*mas*).

Linyphia montana, Blackwall. *Op. cit.*, p. 211, pl. XV., fig. 138.

N. Langleyford and elsewhere. N. and D. I have taken it wherever I have collected on shrubs and tall grass. Adult in late summer.

Linyphia peltata, Wid.

Linyphia peltata, Wid. Zool. Misc., p. 250, taf. XVII., fig. 7.

„ *rubea*, Blackwall. *Op. cit.*, p. 217, pl. XV., fig. 143.

N. Wooler district, Morpeth, Newburn. D. Durham, Wolsingham. Habit of the preceding species, but not so common. It is somewhat like *Linyphia triangularis* in appearance but is smaller.

Linyphia hortensis, Sund.

Linyphia hortensis, Sund. Sv. Spindl. Beskr., f. 1829, p. 213.

„ *pratensis*, Blackwall. *Op. cit.*, p. 215, pl. XV., fig. 141.

N. Wooler district, Newburn. D. Wolsingham, Teesdale. Habit of the two preceding species, but not nearly so common.

Linyphia pusilla, Sund.

Linyphia pusilla, Sund. Sv. Spindl. Beskr., f. 1829, p. 214
(*ad part.*).

„ *fuliginea*, Blackwall. *Op. cit.*, p. 216, pl. XV., fig. 142.

N. Wooler and elsewhere. D. Wolsingham, an adult male among low shrubs in June. The rarest here recorded of this genus.

Linyphia clathrata, Sund.

Linyphia clathrata, Sund. Sv. Spindl., Beskr., f. 1829, p. 218.

Neriere marginata, Bl. *Op. cit.*, p. 249, pl. XVII., fig. 167.

N. Wooler district. N. and D. Common everywhere at the roots of grass; sometimes in the summer ascending to the lower shrubs. Adult in summer.

Linyphia insignis, Bl.

Linyphia insignis, Bl. *Op. cit.*, p. 238, pl. XVII., fig. 160.

N. Wooler district, South Middleton Dean, Bardon Mill, Newburn, Holywell Dene. I have specimens from the Rev. A. M. Norman taken near Sedgfield many years ago. Of all Northum-

brian examples I have seen the abdomen is pale yellow-brown, without the darker markings shown in Blackwall's figure. Adult in September.

LABULLA, Sim.

Labulla thoracica, (Wid.).

Linyphia thoracica, Wid. Zool. Misc., p. 254, pl. XVII., fig. 10.

„ *cauta*, Blackwall. *Op. cit.*, p. 220, pl. XV., fig. 145.

N. Langleyford, Whitley, Newburn. D. Durham, Wolsingham, Teesdale. On low shrubs in damp or shaded places, usually in woods. Adult in summer.

LEPHTHYPHANTES, Menge.

Lephtyphantes minutus, (Bl.).

Linyphia minuta, Blackwall. *Op. cit.*, p. 218, pl. XV., fig. 144.

N. Old Earle and Langleyford, Whitley, Bardon Mill. D. Durham, Low Fell. Common among loose stones and in angles of buildings. Adult in late summer.

Lephtyphantes leprosus, (Ohl.).

Linyphia leprosa, Ohlert. Arachn. Studien, p. 12.

„ *confusa*, Cambridge. Linn. Soc. Trans., vol. XXVII.,
p. 429, pl. LV., fig. 21, *a, b, c, d, f, g.*

N. Old Earle, Wooller, Cheviot Hill. Everywhere under loose stones. Resembling the preceding, but the abdominal pattern is not so distinct. This is a commoner Spider than *L. minutus*.

Lephtyphantes alacris, (Bl.).

Linyphia alacris, Blackwall. *Op. cit.*, p. 235, pl. XVII., fig. 157.

N. Cheviot Hill and Wooller, adult females; Bardon Mill, Morpeth. D. Durham, Teesdale. Among grass and dead leaves up to about 1200 feet in Teesdale. Not common. Adult in May.

Lephtyphantes cristatus, (Menge).

Bathypantes cristatus, Menge. Preuss. Spinn., p. 121, tab. 46,
pl. 22.

Linyphia decolor, Cambridge. Linn. Soc. Trans., vol. XXVII.,
p. 437, pl. LVI., fig. 28.

Linyphia cristata et Linyphia explicata, Cambridge. Id.,
vol. XXX., p. 328.

N. Wooler district, Bardon Mill, Morpeth. D. Durham, Teesdale. Among grass and dead leaves. Not common. Adult in summer. One of Hardy's additions to the British List.

Lephtyphantes tenuis, (Bl.).

Linyphia tenuis, Blackwall. *Op. cit.*, p. 230, pl. XVI., fig. 162.

N. North Northumberland. N. and D. The commonest species of this genus. May be found among grass everywhere. Adult, early summer. Identified in Cambridge's Cheviot List with *L. tenebricola*, Wid., an allied species.

Lephtyphantes angulatus, (Cb.)

Linyphia angulata, Cb. Spiders of Dorset, vol. II., p. 519.

N. Cheviot Hill, one adult male. Identified by the Rev. O. P. Cambridge in his list of Mr. Hardy's Cheviot Spiders with *L. angulipalpis*, an allied species. *L. angulatus* has not, I think, been found elsewhere.

Lephtyphantes ericaeus, (Bl.).

Linyphia ericaea, Blackwall. *Op. cit.*, p. 237, pl. XVII., fig. 159.

N. Langleyford, adults of both sexes.

Lephtyphantes obscurus, (Bl.).

Linyphia obscura, Blackwall. *Op. cit.*, p. 244, pl. XVII., fig. 162.

N. Cheviot Hill, an adult of each sex. I have not seen this Spider. A few specimens have been taken in the Eden Valley (*Aran. Cumb. and Lake Dist.*).

Lepthyphantes flavipes, (Bl.).

Linyphia flavipes, Blackwall. *Op. cit.*, p. 247, pl. XVII., fig. 166.

D. Durham, Upper Teesdale. An adult female at each place.
March and April. A rare species.

Lepthyphantes Blackwallii, Kulez.

Linyphia zebрина. Cb. Spiders of Dorset, p. 182.

Lepthyphantes Blackwallii, Kulez. Ueber d. Therid. Spinn.
Ung., p. 336.

D. Durham, Upper Teesdale, Wolsingham. N. Morpeth,
Bardon Mill. Fairly common among grass. Adult in early
summer.

POECILONETA, Kulez.**Poeciloneta variegata**, (Bl.).

Neriene variegata, Blackwall. *Op. cit.*, p. 282, pl. XIX., fig. 195.

N. Wooler, Langleyford, Cheviot Hill, Bardon Mill, Newburn,
Holywell Dene. D. Durham, Upper Teesdale, Wolsingham.
Common among grass in places rather damp. Adult in summer.

BATHYPHANTES, Menge.**Bathyphantes concolor**, (Wid.).

Linyphia concolor, Wid. Zool. Misc., p. 267, pl. XVII., fig. 3.

Theridion filipes, Blackwall. *Op. cit.*, p. 206, pl. XVI., fig. 136.

N. Wooler. A very common Spider among loose stones, heaps
of rubbish, and like places. Durham. Adult in spring.

Bathyphantes parvulus, (Westr.).

Linyphia parvula, Westr. Aran. Succ., p. 135.

Bathyphantes parvulus, Pickard-Cambridge, F. O. Ann. and
Mag. Nat. Hist., Ser. 6, vol. X., p. 392, pl. XX., fig. 7.

N. Holywell Dene, an adult male. Taken in various parts of
England, but never common. Adult in summer. The example
here recorded was taken in October, 1895.

Bathyphantes pullatus, (Cb.).

Linyphia pullata, Cambridge, O. P. Linn. Soc. Trans., vol. XXVIII., p. 446, pl. XXXIV., fig. 12.

Bathyphantes pullatus, Pickard-Cambridge, F. O. Ann. and Mag. Nat. Hist., Ser. 6, vol. XIII., pl. I., fig. 10.

D. Durham. N. Morpeth, Bardon Mill. Attains maturity in the spring, at which season I have found it fairly plentiful at Durham along with *B. concolor* and *B. nigrinus*.

Bathyphantes dorsalis, (Wid.).

Linyphia dorsalis, Wid. Zool. Misc., p. 258, pl. XVII., fig. 12.

„ *Claytoniae*, Bl. *Op. cit.*, p. 233, pl. XVI., fig. 155.

Bathyphantes dorsalis, Pickard-Cambridge, F. O. Ann. and Mag. Nat. Hist., Ser. 6, vol. XIII., pl. I., fig. 9.

N. Hedgehope, Wooler and district, Morpeth, Bardon Mill, Newburn. D. Durham, Upper Teesdale, Urpeth. Not uncommon among grass, and sometimes on the foliage of shrubs. Adult in summer.

Bathyphantes nigrinus, (Westr.).

Linyphia nigrina, Westr. Aran. Succ., p. 132.

„ *pulla*, Blackwall. *Op. cit.*, p. 234, pl. XVI., fig. 156.

Bathyphantes nigrinus, Pickard-Cambridge, F. O. Ann. and Mag. Nat. Hist., Ser. 6, vol. XIII., pl. I., fig. 7.

N. and D. Common everywhere under stones and at the roots of grass, especially in the spring, when it attains maturity.

Bathyphantes approximatus, (Cb.).

Linyphia approximata, Cambridge. Linn. Soc. Trans., vol. XXVII., p. 424, pl. LV., fig. 19.

Bathyphantes approximatus, Pickard-Cambridge, F. O. Ann. and Mag. Nat. Hist., Ser. 6, vol. XIII., pl. I., fig. 8.

N. Wooler, Bardon Mill, and Holywell Dene; only a few adult examples of both sexes, September and October, 1895. Apparently not common.

Bathyphantes gracilis, (Bl.).

Linyphia gracilis, Blackwall. *Op. cit.*, p. 245, pl. XVII., fig. 163.

„ *circumspecta*, „ „ p. 246, pl. XVII., fig. 165.

Bathyphantes gracilis, Pickard-Cambridge, F. O. Ann. and
Mag. Nat. Hist., Ser. 6, vol. X., p. 393,
pl. XXI., figs. 6 a, b, c, d.

N. Langleyford, adult male and females; Bardon Mill, Holywell Dene. D. Durham, Upper Teesdale, Urpeth. Fairly common among the tufts of herbage in damp places.

PORRHOMMA, (Sim.).**Porrhomma pygmaeum**, (Bl.).

Neriere pygmaea, Blackw. *Op. cit.*, p. 261, pl. XVIII., fig. 177.

Porrhomma pygmaeum, Pickard-Cambridge, F. O. Ann. and
Mag. Nat. Hist., Ser. 6, vol. XIII., pl. II., fig. 3.

N. Cold Martin Moss, Wooler. D. Durham, adult males.

Porrhomma microphthalmum, (Cb.).

Linyphia microphthalma, Cambridge. Linn. Soc. Trans., vol.
XXVII., p. 435, pl. LVI., fig. 25.

„ *decens*, Cambridge. Linn. Soc. Trans., vol. XXVII.,
p. 437, pl. LVI., fig. 27.

Porrhomma Meadii, Pickard-Cambridge, F. O. Ann. and Mag.
Nat. Hist., Ser. 6, vol. XIII., pl. II., fig. 7.

Neriere errans, Trans. Tyneside Nat. Field Club, vol. V., p. 49.

N. Cheviot Hill, one adult female. D. Males and females were sent to Dr. Mead of Bradford from Pelton coal-pits, near Chester-le-Street, in 1860. They had probably been conveyed down the shaft among the horse-fodder, and lived gregariously in a common web.

Porrhomma (?) contritum, (Cb.).

Linyphia contrita, Cambridge. Linn. Soc. Trans., vol. XXVIII.,
p. 537, pl. XLVI., fig. 7.

N. Cheviot Hill, an adult male. One of Mr. Hardy's additions to Science, October, 1871. I have never seen this Spider.

TMETICUS, (Menge).**Tmeticus abnormis, (Bl.).**

Neriere abnormis, Blackwall. *Op. cit.*, p. 286.

D. Durham, an immature male; Upper Teesdale, an adult female (May). In tufts of grass by streams. Apparently rare. Included in the Berwickshire List.

Tmeticus adipatus (L. K.).

Erigone adipata, L. K. Zeitschr. Ferd., p. 263.

Linyphia reticulata, Cambridge. Linn. Soc. Trans., vol. XXVIII., p. 540, pl. XLVI., fig. 11.

N. Hedgehope and Cheviot Hill, adults of both sexes, in the autumn of 1871. It was discovered about the same time by Dr. L. Koch on a mountain in South Tyrol, and described under the name of *Erigone adipata*.

Tmeticus Huthwaitii, (Cb.).

Neriere Huthwaitii, Bl. *Op. cit.*, p. 260, pl. XVIII., fig. 176.

N. Wooler, an adult male. A rare species.

Tmeticus rufus, (Wid.).

Theridium rufum, Wid. Zool. Misc., p. 223, pl. XV., fig. 3.

Neriere rubripes, Blackwall. *Op. cit.*, p. 287, pl. XIX., f. 201.

N. Wooler, adult male; another on Hedgehope; and a third on Cheviot Hill.

Tmeticus denticulatus, n. sp.

Length of adult male, 2·9 mm.

Cephalothorax dark brown, broad oval (1·2 mm. by 1 mm.); caput low; dorsal profile somewhat convex, highest point about 3 mm. behind the central eyes.

Eyes rather small and closely grouped: posterior row straight; centrals nearer to each other than to the laterals, largest of the eight: anterior row slightly curved, convexity forwards (line

joining front margins of laterals will bisect the centrals); centrals smallest of all, about equidistant from posterior centrals and anterior laterals, their own interval less.

Clypeus higher than ocular area, convex.

Sternum (.8 mm. by .6 mm.) light brown, produced between the posterior coxae.

Legs dull yellow, clothed with short hairs; femora unarmed; patellae with one weak spine; tibiae with two spines above, one towards the apex, the other near the base; protarsi unarmed.

Abdomen pale olive green without pattern, clothed with short hairs.

Falces (.6 mm.) stout, and convex at the base, striate externally, slightly divergent, and provided with a conical apophysis on the inner face pointing forwards and inwards, truncate, and bearing a fine short bristle.

Palpus. Humeral joint four times the length of cubital, which is two-thirds of the radial: cubital joint bears a short sinuous spine above: radial joint as broad at its outer extremity as long, showing three processes clasping the digital joint, two above and one beneath, the latter acute; the inner above also acute, its point curved slightly outwards from the digital joint. Digital joint hardly broader than the radial, very convex, bearing a strong spine about the middle and two others not quite so long at its extremity. Palpal organs rather complex: the terminal third is a membranous bulb; from its base on the inner side springs a red-brown bandlike process clasping the bulb and projecting beyond it, denticulate along its truncate extremity, and bearing two or three small dark projections; from the outer side of the base a most characteristic process,—almost flat but slightly keeled externally, narrowing to its blunt extremity, the inner edge denticulate,—pointing forwards and outwards, nearly reaching the extremity of the joint. At the base of the palpal organs is a dark-brown hooked process with a blunt point.

N. A single adult male was taken from under a stone on the coast near Whitley, Oct. 23, 1895. It is nearly allied to *Tmeticus simplex*, F. Cb., and *Tm. denticelalis*, Sim., but the denticulate process of the palpal organs and the form of the radial joint of

the palpus will distinguish the male from either. It is still more nearly allied to *Tmeticus* (*Neriene*) *reprobatus*, Cb. (Ann. and Mag. Nat. Hist., Ser. 5, vol. IV., p. 196, pl. XII.), the palpal organs being remarkably similar. In the present Spider, however, the digital joint of the palpus is armed with three spines: the radial joint exceeds the cubital in length: the falcate process is stout and truncate; the falcates bear a very distinct longitudinal row of granulations, and the abdomen is greenish.

CENTROMERUS, (Dahl).

Centromerus bicolor, (Bl.).

Neriene bicolor, Blackwall. *Op. cit.*, p. 250, pl. XVII., fig. 168.

N. North Northumberland, all localities; Bardon Mill, Whitley, Holywell Dene, Morpeth, Newburn. D. Urpeth. Very common from August onwards, at the roots of grass and in like places.

Centromerus concinnus, Thor.

Centromerus concinnus, Thor. Tijdschr., voor Entom., vol. XVIII., p. 87.

„ „ Sim. Arach. de France, vol. V., p. 402.

N. Bardon Mill, Holywell Dene, Whitley. Among grass; always, I think, with *Centromerus bicolor*, but apparently quite distinct.

Centromerus expertus, (Cb.).

Linyphia experta, Cambridge. Linn. Soc. Trans., vol. XXVII., p. 429, pl. LV., fig. 23.

N. Cold Martin Moss, Cheviot Hill. A rare Spider.

Centromerus silvaticus, (Bl.).

Neriene sylvatica, Bl. *Op. cit.*, p. 254.

Tmeticus silvaticus, Simon. Arachn. de France, vol. V., p. 410.

N. Langleyford, Hedgehope, Humbleton Hill, Wooler, Bardon Mill. D. Urpeth. Adult from the middle of August. Not common.

Centromerus arcanus, (Cb.).

Linyphia arcana, Cambridge. Linn. Soc. Trans., vol. XXVIII.,
p. 539, pl. XLVI., fig. 10.

N. Cheviot Hill, an adult male. One of Hardy's additions to Science; since taken on the Continent.

Centromerus prudens, (Cb.).

Linyphia prudens, Cambridge. Linn. Soc. Trans., vol.
XXVIII., p. 538, pl. XLVI., fig. 9.

N. Old Earle, Cheviot Hill, Wooler, adults of both sexes. This Spider seems referable to this genus, but I know it only from the description and figure quoted above. It has not, so far as I know, been met with elsewhere.

PEDINA, Menge.**Pedina scopigera, (Grübe).**

Pedina cristata, Menge. Preuss. Spinn., vol. I., p. 125, pl.
XXIII., fig. 49.

Tmetiscus scopiger, Simon. Arachn. de France, vol. V., p. 385,
figs. 158, 159.

N. Hedgehope and Wooler (1871, then new to the British list). D. Urpeth (August, 1895), plentiful in this one place among rather damp, long grass.

MICRONETA, Menge.**Microneta viaria, (Bl.).**

Neriere viaria, Bl. *Op. cit.*, p. 255, pl. XVIII., fig. 171.

N. Humbleton Hill, adult males and females. D. Harperley, near Wolsingham, one adult female, in June.

MICRYPHANTES, Menge.**Micryphantes corniger, (Bl.).**

Neriere cornigera, Bl. *Op. cit.*, p. 273, pl. XIX., fig. 187.

D. Durham. Of this rare Spider I have taken two adult males by the river within the city, and one in Houghal Wood—the former in a crevice of an old wall, the latter among dead leaves.

Micryphantes fuscipalpis, C. L. K.

Neriere gracilis, Bl. *Op. cit.*, p. 256, pl. XVIII., fig. 172.

„ *flavipes*, Bl. „ p. 264, pl. XVIII., fig. 178.

N. Wooler district, Bardon Mill, Holywell Dene. Adults were taken in September and October under stones. Not common.

Micryphantes sublimis, (Cb.).

Neriere sublimis, Cambridge. Proc. Berw. Nat. Club (1874),
vol. VII., p. 314.

N. Top of Cheviot Hill, an adult male and three adult females. One of Hardy's additions to Science. "A very local species, but taken plentifully from under stones on the slopes of Helvellyn, in September, 1890." (*Aran. Cumb. and Lake Dist.*—F. O. Pickard-Cambridge).

ERIGONE, (Sav. et Aud.).**Erigone atra**, Bl.

Neriere longipalpis, Bl. *Op. cit.*, p. 274, in part.

„ *atra*, Cambridge. Linn. Soc. Trans., vol. XXVIII.,
p. 448, pl. XXXIV., fig. 22.

N. North Northumberland, various localities. This species, which ought not to be uncommon, I have not myself seen in either Northumberland or Durham.

Erigone dentipalpis, (Wider.).

Neriere longipalpis, Bl. *Op. cit.*, p. 274, in part.

„ *dentipalpis*, Cambridge. Linn. Soc. Trans., vol.
XXVII., p. 448, pl. XXXIV., fig. 21.

N. Wooler, Cheviot, Bardon Mill, Newburn, Holywell Dene. D. Durham. Common.

Erigone promiscua, (Cb.).

Neriere promiscua, Cambridge. Linn. Soc. Trans., vol.
XXVIII., p. 449, pl. XXXIV., fig. 25.

N. Cold Martin Moss, Wooler. Whitley, on the sea bank, an adult male. Very nearly allied to the two foregoing, but apparently very much rarer.

Erigone graminicola, Sund.

Neriere graminicola, Bl. *Op. cit.*, p. 272, pl. XIX., fig. 186.

N. Wooler district, adult females. Apparently rare. I have not seen it; nor is it in the Cumbrian list.

TISO, Sim.**Tiso vagans**, (Bl.).

Neriere vagans, Bl. *Op. cit.*, p. 257, pl. XVIII., fig. 173.

N. Cheviot Hill, Hedgehope, Humbleton Hill, Old Earle.
D. Ryhope, an adult male, in June.

TRACHYGNATHA, Kulcz.**Trachygnatha dentata**, (Wid.).

Neriere dentata, Bl. *Op. cit.*, p. 258, pl. XVIII., fig. 174.

N. Wooler district, adult females.

GONGYLIDIUM, Menge.**Gongylidium rufipes**, (L.).

Aranea rufipes, Linn. *Syst. Nat.*, ed. 10, vol. I., p. 621.

Neriere munda, Bl. *Op. cit.*, p. 265, pl. XVIII., fig. 180.

D. Ryhope, Barnard Castle. Not common. Adult in spring;
in damp places and under stones.

NERIENE, (Bl.).**Neriere apicata**, Bl.

Neriere apicata, Bl. *Op. cit.*, p. 269, pl. XVIII., fig. 183.

N. Wooler, an adult male. Bardon Mill and Holywell Dene,
in October, adult males. Adult throughout the summer.

Neriere retusa, Westr.

Erigone retusa, Westr. *Aran Suec.*, p. 253.

Neriere elevata, Cambridge. *Zoologist*, 1862, p. 7966.

N. South Middleton Dean, Cheviot. D. Durham, an adult
male among grass in Pelaw Wood. Not common.

Nerienne fusca, Bl.

Nerienne fusca, Bl. *Op. cit.*, p. 275. pl. XIX., fig. 189, and
pl. XXII., fig. E.

N. Bardon Mill. D. Durham. Adult males in September
under stones and among grass. Not common.

Nerienne agrestis, Bl.

Nerienne agrestis, Bl. *Op. cit.* p. 276, pl. XIX., fig. 190, and
pl. XXII., fig. D.

N. Wooler and Wooler district, Langleyford, and Hedgehope.
Adult in summer.

Nerienne gibbosa, Bl.

Nerienne gibbosa, Bl. *Op. cit.*, p. 278.

„ „ Cambridge. Linn. Soc. Trans., vol. XXVIII.,
p. 445, pl. XXXIV., 20.

N. Top of Cheviot, one adult male.

Nerienne tuberosa, Bl.

Nerienne tuberosa, Bl. *Op. cit.*, p. 279, pl. XIX., fig. 192, and
pl. XXII., fig. 13.

D. Durham. Adult male, spring, 1894.

Nerienne (?) curtipes, Cb.

Nerienne curtipes, Cambridge. Proc. Berw. Nat. Club (1874),
vol. VII., p. 314.

N. Langleyford, one adult male. One of Hardy's discoveries.

Nerienne (?) morula, Cb.

Nerienne morula, Cambridge. Linn. Soc. Trans., vol. XXVIII.,
445, pl. XLVI., fig. 16.

N. Cheviot Hill, male and female adult. Another of Hardy's
discoveries. I am unable to assign this and the preceding to
any of the genera into which *Nerienne* has been divided, and
consequently place them under the name by which they were
originally described.

GONATIUM, Menge.**Gonatium rubens, (Bl.).**

Neriere rubens, Bl. *Op. cit.*, p. 270, pl. XVIII., fig. 184.

N. Wooler, Cheviot, and neighbourhood. Everywhere plentiful among damp grass, frequently ascending into the lower shrubs (especially Furze) in the sunshine. Adult in summer.

Gonatium isabellinum, (C. L. K.).

Micryphantes isabellinus, C. L. K. *Die Arachn.*, vol. VIII., p. 109, taf. CCLXXXII., figg. 676-678.

Neriere rubella, Bl. *Op. cit.*, p. 281, pl. XIX., fig. 194.

N. Bardon Mill. D. Durham, Harperley, near Wolsingham. Damp places in woods. Not nearly so common as the preceding. Adult in summer. Taken by Hardy in Berwickshire.

HYPOMMA, Dahl.**Hypomma bituberculatum, (Wid.).**

Neriere bituberculata, Bl. *Op. cit.*, p. 268, pl. XVIII., fig. 182.

N. Wooler and Cold Martin Moss. D. Durham, Upper Teesdale, Wolsingham. In damp places among grass, spring and summer. Not common.

HILAIRA, Sim.**Hilaira uncata, (Cb.)**

Neriere uncata, Cambridge. Linn. Soc. Trans., vol. XXVIII., pl. XLVI., fig. 17.

N. Wooler, adults of both sexes. Another of Hardy's additions to Science.

Hilaira excisa, (Cb.).

Neriere excisa, Cambridge. Linn. Soc. Trans., vol. XXVII., LVI., fig. 29.

N. Wooler district, adult males. An uncommon Spider, first discovered at Paisley in 1866.

DICYPHUS, Menge.**Dicyphus cornutus, (Bl.).**

Nerience cornuta, Bl. *Op. cit.*, p. 267, pl. XVIII, fig. 181.

N. Wooler, an adult male. D. Durham, Upper Teesdale.
Rare. Adult in spring.

DISMODICUS, Sim.**Dismodicus bifrons, (Bl.).**

Walckenaëra bifrons, Bl. *Op. cit.*, p. 302, pl. XXI, fig. 218.

N. Cheviot Hill, an adult male. D. Durham, Upper Teesdale, Wolsingham. Adult in spring and throughout the summer: not rare.

DICYMBIUM, Menge.**Dicymbium nigrum, (Bl.).**

Nerience nigra, Bl. *Op. cit.*, p. 271, pl. XVII., fig. 185.

N. Wooler, Hedgehope, Langleyford, Morpeth. North Shields, running in the morning sun upon the top of a wall in considerable numbers, October.

Dicymbium tibiale, (Bl.).

Nerience tibialis, Bl. *Op. cit.*, p. 266.

N. Langleyford, three adult males; Bardon Mill. D. Urpeth, adult males, August and September. A rare Spider.

PLAESIOCRAERUS, Sim.**Plaesiocraerus fuscipes, (Bl.).**

Walckenaëra fuscipes, Bl. *Op. cit.*, p. 295, pl. XX., fig. 209.

N. Wooler and Humbleton Hill, adult males.

Plaesiocraerus permixtus, (Cb.).

Walckenaëra permixta, Cambridge. Linn. Soc. Trans., vol. XXVII., p. 455, pl. LVII., fig. 40.

N. Wooler, adult males.

Plaesiocraerus alpinus, (Cb.).

Erigone alpina, Cambridge. Proceedings of Zool. Soc. (1872),
p. 767, pl. LXVI., fig. 29.

Plaesiocraerus alpinus, Simon. Arachnides de France, vol. V.,
part 3, p. 760.

D. Upper Teesdale, May, 1894, an adult male. A rare Spider.

WIDERIA, Sim.**Wideria antica, (Wid.).**

Walckenaera antica, Bl. *Op. cit.*, p. 310, pl. XXI., fig. 215.

N. Old Earle, Wooler, Hedgehope, Langleyford. D. Upper Teesdale, Durham. Adult in spring.

Wideria nodosa, (Cb.).

Walckenaera nodosa, Cambridge. Linn. Soc. Trans., vol.
XXVIII., p. 550, pl. XLVI., fig. 21.

N. Cold Martin Moss, an adult male. Another of Hardy's additions to Science.

DIPLOCEPHALUS, Bertk.**Diplocephalus cristatus, (Bl.).**

Walckenaera cristata, Bl. *Op. cit.*, p. 309, pl. XXI., fig. 224.

N. Wooler, adult male. Common everywhere, spring and summer, at the roots of grass, or running on walls and palings in morning sunshine.

Diplocephalus humilis, (Bl.).

Walckenaera humilis, Bl. *Op. cit.*, p. 307, pl. XXI., fig. 223.

N. Holywell Dene. D. Durham. Under stones and at the roots of grass, spring and autumn.

Diplocephalus latifrons, (Cb.).

Walckenaera latifrons, Cambridge. Linn. Soc. Trans., vol.
XXVIII., p. 453, pl. XXXV., fig. 31.

N. Cheviot Hill, an adult male. Bardon Mill, an adult male in September. Adult in spring.

Diplocephalus picinus, (Bl.).

Walckenaëra picina, Bl. *Op. cit.*, p. 313, pl. XXI., fig. 228.

D. Durham, adult males in spring among grass. Rare.

SAVIGNIA, Bl.**Savignia frontata**, Bl.

Savignia frontata, Bl. Lond. and Edinb. Ph. Mag., Ser. 3,
vol. III., p. 105.

Walckenaëra frontata, Bl. *Op. cit.*, p. 317, pl. XX., fig. 228.

N. South Middleton Dean, Wooler, Cheviot Hill, Holywell
Dene, Bardon Mill, North Shields. Not common.

ENTELECARA, Sim.**Entelecara trifrons**, (Cb.)

Walckenaëra trifrons, Cambridge. Linn. Soc. Trans., vol.
XXVIII., p. 458, pl. XXXV., fig. 32.

N. Cheviot Hill and Langleyford. Adult in spring.

BRACHYCENTRUM, Dahl.**Brachycentrum nemorale**, (Bl.).

Walckenaëra nemoralis, Bl. *Op. cit.*, p. 315, pl. XXII., fig. 230.

N. Wooler, adult male. Adult in spring.

POCADYCNEMIS, Sim.**Pocadycnemis pumila**, (Bl.).

Walckenaëra pumila, Bl. *Op. cit.*, p. 312, pl. XXI., fig. 217.

D. Durham, Ryhope, adult males. Rare. Among grass in
spring and summer.

NEMATOGMUS, Sim.**Nematogmus obscurus**, (Walck.).

Walckenaëra obscura, Bl. *Op. cit.* p. 297, pl. XX., fig. 212.

N. Wooler, an adult male.

CORNICULARIA, Menge.

Cornicularia cuspidata, (Bl.)

Walckenaëra cuspidata, Bl. *Op. cit.*, p. 290, pl. XX., fig. 204.

N. Wooler, South Middleton Dean, Hedgehope, Bardon Mill.
D. Durham, Upper Teesdale. Not rare on grassy banks. In
Teesdale up to 1200 feet in spring.

Cornicularia unicornis, (Cb.).

Walckenaëra unicornis, Bl. *Op. cit.*, p. 293, pl. XX., fig. 207.

N. Cold Martin Moss, adult males. D. Durham, among grass
in spring. Rare.

Cornicularia clara, (Cb.).

Neriere clara, Cambridge. Linn. Soc. Trans., vol. XXVIII.,
p. 544, pl. XLVI., fig. 14.

N. Cheviot Hill, adult female. One of Hardy's additions to
Science.

Cornicularia (?) *pudens*, (Cb.).

Neriere pudens, Cambridge. Linn. Soc. Trans., vol. XXVII.,
p. 544, pl. XLVI., fig. 15.

N. Cheviot Hill, adult female. Another of Hardy's dis-
coveries: not seen elsewhere, so far as I am aware.

Cornicularia (?) *pavitans*, (Cb.).

Neriere pavitans, Cambridge. Linn. Soc., Trans., vol. XXVIII.,
p. 543, pl. XLVI., fig. 13.

N. Cheviot Hill, adult female. Another of Hardy's dis-
coveries; still, I think, a unique specimen.

TROXOCHRUS, Sim.

Troxochrus scabriculus, (Westr.).

Erigone scabriculus, Westr. Aran. Suec., p. 248.

Walckenaëra aggeris, Bl. *Op. cit.*, p. 301, pl. XXI., fig. 216.

N. Whitley. D. Durham. Adult males. Rare.

LOPHOMMA, Menge.**Lophomma punctatum**, (Bl.).

Walckenaëra punctata, Bl. *Op. cit.*, p. 295, pl. XX, fig. 210,
and pl. XXII., fi. A.

N. Wooler, adult male; Holywell Dene. D. Durham. Under stones, spring and autumn. Not common.

TAPINOCYBA, Sim.**Tapinocyba subitanea**, (Cb.).

Erigone subitanea, Cambridge. Ann. Mag. Nat. Hist., Ser. 4,
vol. XVI., p. 249, pl. IX., fig. 7.

D. Durham, one adult male, June, 1895. Among loose stones.

Tapinocyba Beckii, (Cb.).

Walckenaëra Beckii, Cambridge. Linn. Soc. Trans., vol. XXVII.,
pl. LVII., fig. 44.

Tapinocyba Beckii, Kulczynski. Aran. Hung., vol. II., p. 130,
pl. V., fig. 9.

N. An adult male of this small Spider was taken at Preston, near North Shields, December, 1895. It is a rather uncommon species.

CERATINELLA, Emert.**Ceratinella brevipes**, (Westr.).

Walckenaëra brevipes, Cambridge. Linn. Soc. Trans., vol.
XXVIII., p. 454., pl. XXXV., fig. 28.

N. Cold Martin Moss, adult male.

WALCKENAËRA, (Bl.).**Walckenaëra acuminata**, Bl.

Walckenaëra acuminata, Bl. *Op. cit.*, p. 289, pl. XX., fig. 203.

N. Wooler, Langleyford, Cheviot Hill, Bardon Mill. D. Durham, Urpeth. Not uncommon among grass.

PEPONOCRANIUM, Sim.**Peponocranium ludicrum**, (Cb.).

Walckenaera ludicra, Bl. *Op. cit.*, p. 316, pl. XXI., fig. 231.

D. Upper Teesdale (1200 feet). May, 1894, one adult male among grass.

PACHYGNATHA, Sund.**Pachygnatha Clerckii**, Sund.

Pachygnatha Clerckii, Bl. *Op. cit.*, p. 318, pl. XXII., fig. 233.

N. Wooler, South Middleton Dean. N. and D. Everywhere in damp places at the roots of herbage. Adults may be taken all the year round.

Pachygnatha Degeerii, Sund.

Pachygnatha Degeerii, Bl. *Op. cit.*, p. 321, pl. XXII., fig. 235.

N. Wooler, Langleyford, Hedgehope. N. and D. At the roots of herbage everywhere. Adult in spring.

FAMILY VI. EPEIRIDAE (12 species).

META, C. L. K.**Meta Menardi**, (Latr.).

Aranea Menardi, Latr. H. N. d. Crust. et d. Ins., vol. VII., p. 266.

Epeira fusca, Bl. *Op. cit.*, p. 349, pl. XXVI., fig. 252.

D. Recorded by the Rev. O. P. Cambridge (*Spiders of Dorset*) from overhanging rocks and caverns in Durham county. An adult female from Kepier Wood, Durham, is in the collection of Mr. T. J. R. Hindmarsh of that city.

Meta segmentata, (Clk.).

Araneus segmentatus, Clk. Sv. Spindl., p. 45, pl. II., tab. 6.

Epeira inclinata, Bl. *Op. cit.*, p. 354, pl. XXVI., fig. 255.

N. North Northumberland, various localities. N. and D. The commonest Spider of this genus with us, spreading its web everywhere. Adult in summer.

Meta Merianae, (Scop.).

Aranea Merianae, Scop. Ent. Carn., p. 395.

Epeira antriada, Bl. *Op. cit.*, p. 351, pl. XXVI., fig. 253.

N. Cheviot Hill, Wooler district. N. and D. Common everywhere under damp, overhanging banks.

TETRAGNATHA, Latr.**Tetragnatha extensa**, (L.).

Tetragnatha extensa, Bl. *Op. cit.*, p. 337, pl. XXVIII., fig. 265.

N. South Middleton Dean, Wooler district, Newburn. D. Durham, Wolsingham. On shrubs and tall grass by the river. Common.

Tetragnatha Solandrii, (Scop.).

Tetragnatha Solandrii, Kulez. Aran. Hung., vol. I., p. 145, tab. V., fig. 9.

D. Durham. On rocks and long grass by the river in Kepier Wood. Adult in June.

CERCIDIA, Thor.**Cercidia prominens**, (Westr.).

Epeira prominens, Westr. Förteckn., etc., p. 35.

„ *bella*, Bl. *Op. cit.*, p. 343, pl. XXV., fig. 248.

N. Blackwall (*loc. cit.*) records this Spider from Northumberland. Probably this may be in error for Berwickshire, where it was taken by Mr. Hardy.

ZILLA, (C. L. K.).**Zilla x-notata**, (Clk.).

Epeira similis, Bl. *Op. cit.*, p. 337, pl. XXV., fig. 224.

Zilla x-notata, Pickard-Cambridge, F. O. Ann. Mag. Nat. Hist., Ser. 6, vol. X., pl. XXI., fig. 8.

N. Wooler district. Common everywhere on shrubs (especially Furze), angles of buildings and like places. Adult in summer.

Zilla atrica, C. L. K.

Epeira calophylla, Bl. *Op. cit.*, p. 338, pl. XXV., fig. 245.

Zilla atrica, Pickard-Cambridge, F. O. Ann. Mag. Nat. Hist.,
Ser. 6, vol. X., pl. XX., fig. 2,
and pl. XXI., fig. 9.

N. Wooler and Cold Murtin Moss. This Spider very closely resembles the preceding, but the male of this species may be distinguished by the elongated palpi. The females may best be separated by the form of the epigyne (see fig. by Pickard-Cambridge, *loc. cit.*). The habits of the two species seem to be slightly divergent in one particular: I have never seen the present species on a building of any kind, but nearly always on Furze or similar low shrubs. Adult in summer.

EPEIRA, Walck.**Epeira cucurbitina, (Clk.).**

Epeira cucurbitina, Bl. *Op. cit.*, p. 342, pl. XXV., fig. 247.

N. Wooler district, adult male and females.

Epeira diademata, (Clk.).

Araneus diadematus, Clk. Sv. Spindl., p. 25, pl. I., tab. 4.

Epeira diadema, Bl. *Op. cit.*, p. 358, pl. XXVI., fig. 258.

N. Wooler district and several other North Northumberland localities. To be found everywhere on shrubs (especially Furze) but not so common as either species of *Zilla*. It ranges from the coast links to our highest fells. In the hill country it makes its home in the fell walls, and appears to adapt its colour to its surroundings. The prevailing hue is darkened considerably and the white cross pattern on the abdomen, though quite distinct as a rule, is not so conspicuous. Adult in summer.

Epeira cornuta, (Clk.).

Araneus cornutus, Clk. Sv. Spindl., p. 39, pl. I., tab. 11.

Epeira apoelisa, Bl. *Op. cit.*, p. 235, pl. XXIII., fig. 237.

N. Wooler district, adults, both sexes. I have not seen this

fine Spider within our area. It constructs a tubular retreat in the panicle of a reed or tall grass in boggy places, or by still water. The snare is, if possible, hung vertically over the surface of water, the suspension threads being sometimes nearly a yard in length. Adult at the end of summer.

Epeira umbratica, (Clk.).

Araneus umbraticus, Clk. Sv. Spindl., p. 31, pl. I., tab. 7.

Epeira umbratica, Bl. *Op. cit.*, p. 333, pl. XXIV., fig. 241.

N. Langleyford, adult females. I have not yet met with it in either county. It is a nocturnal Spider, hiding by day in crevices of buildings, under loose bark of fallen trees, and similar places; but its web, coarsely constructed of large and irregular mesh, betrays its presence. It may readily be recognised by its flattened abdomen and dingy hue. Adult in late summer.

FAMILY VII. THOMISIDAE (9 species).

Xysticus, C. L. K.

Xysticus cristatus, (Clk.).

Araneus cristatus, Clk. Sv. Spindl., p. 136, pl. VI., tab. 6.

Thomisus cristatus, Bl. *Op. cit.*, p. 68, pl. IV., fig. 38.

N. Langleyford and elsewhere in North Northumberland. Very common elsewhere at the roots of herbage. D. Adult females have been taken under stones on the top of Widdy Bank Fell, Upper Teesdale, in spring.

Xysticus viaticus, C. L. K.

Xysticus viaticus, C. L. K. *Die Arachn.*, vol. XII., p. 70, pl. 412, figs. 1003-4.

N. Wooler and South Middleton Dean. Adult females.

Xysticus lanio, C. L. K.

Thomisus lanio, Cambridge. *Zoologist* (1861), p. 7557 and (1862), p. 7946,

„ „ *Id.* *Spiders of Dorset*, p. 303, pl. V., fig. 1.

N. Cheviot Hill, an adult female.

Xysticus erraticus, (Bl.).

Thomisus erraticus, Bl. *Op. cit.*, p. 71, pl. IV., fig. 40.

N. Langleyford, an adult female.

OXYPTILA, Sim.**Oxyptila trux**, (Bl.).

Thomisus trux, Bl. *Op. cit.*, p. 84, pl. IV., fig. 50.

N. Cold Martin Moss, Wooler, and South Middleton Dean.

Oxyptila atomaria, (Panz.).

Aranea atomaria, Panz. Faun. Ins. Germ., p. 74.

Thomisus versutus, Bl. *Op. cit.*, p. 83, pl. IV., fig. 49.

N. Cold Martin Moss, an adult female.

Oxyptila flexa, Cb.

D. Durham. An adult male and an immature female were beaten from Furze near the city in the summer of 1894. Specimens were already in the possession of the Rev. O. P. Cambridge, who will figure and describe this new species in the Proceedings of the Dorsetshire Nat. Hist. Society for the present year. Since its discovery in 1894 I have taken this Spider in tolerable plenty in Leicestershire, on Furze and grass, during the summer of this year, 1895.

PHILODROMUS, Walck.**Philodromus aureolus**, (Clk.).

Philodromus aureolus, Bl. *Op. cit.*, p. 99, pl. V., fig. 59.

„ *cespitolis*, Bl. „ p. 95, pl. V., fig. 58.

N. Wooler district. D. Durham, Wolsingham, Ryhope. On Furze. Adult in summer. There is considerable variation in colour and markings.

TIBELLUS, Sim.**Tibellus oblongus**, (Walck.).

Philodromus oblongus, Bl. *Op. cit.*, p. 100, pl. V., fig. 60.

N. Cold Martin Moss, adults of both sexes. It comes to

maturity in spring. Having had no opportunity of sweeping the herbage of our Carrs and Mosses, I have not found this Spider in either county. In the fens a single sweep of the net among the tall grass and rushes by a ditch will yield examples of *Epeira cornuta*, *Tetragnatha extensa*, *Tibellus oblongus*, with, of course, the ubiquitous *Meta segmentata*.

FAMILY VIII. LYCOSIDAE (17 species).

OCYALE, Thor.

Ocyale mirabilis, (Clk.),

Dolomedes mirabilis, Bl. *Op. cit.*, p. 37, pl. II., fig. 18.

D. Examples of this species were contained in a collection of Spiders made in the neighbourhood of Sedgefield by the Rev. A. M. Norman, and dated 1862.

PIRATA, Sund.

Pirata hygrophilus, Thor.

Pirata hygrophilus, Thor. Rem. on. Syn., p. 343.

Lycosa piscatoria, Bl. *Op. cit.*, p. 36, pl. II., fig. 17, and
pl. III., fig. 17.

D. Durham. Not rare in boggy places. Adult in early summer.

Pirata piraticus, (Clk.).

Lycosa piratica, Bl. *Op. cit.*, p. 34, pl. II., fig. 16, and pl. III.,
fig. 16.

N. Wooler, Cheviot Hill, Cold Martin Moss. D. Durham, Upper Teesdale, where it was abundant on the southern side of Widdy Bank Fell in April, 1895, though not mature at that early season. Adult in June. Blackwall's figures of this and the preceding species are not good.

TROCHOSA, C. L. K.

Trochosa picta, (Hahn.).

Lycosa picta, Bl. *Op. cit.*, p. 25, pl. I., fig. 8.

N. Wooler district, adults of both sexes. A vividly marked Spider.

Trochosa cinerea, (Fabr.).

Aranea cinerea, Fabr. Ent. Syst., vol. II., p. 423.

Lycosa allodroma, Bl. *Op. cit.*, p. 23, pl. I., fig. 7.

N. Wooler. An example of this species, taken at Jesmond, is in the Hancock Museum. A large and handsome Spider.

Trochosa ruricola, (De Geer).

Aranea ruricola, De G. Mém., vol. VII., p. 282, pl. II.,
figg. 13, 14.

Lycosa campestris, Bl. *Op. cit.*, p. 18, pl. I., fig. 3.

N. Wooler district, adults of both sexes.

Trochosa terricola, Thor.

Trochosa terricola, Thor. Rec. Crit. Aran., pp. 62, 102.

Lycosa agretyca, Bl. *Op. cit.*, p. 17, pl. I., fig. 2.

N. Old Earle, Wooler district, Newburn, Bardon Mill, Whitley.
D. Durham, Upper Teesdale. Fairly plentiful under stones in spring and autumn. The female frequently excavates a retreat for herself and her egg-cocoon in the soft earth of a bank.

TARENTULA, (Sund).**Tarentula pulverulenta**, (Clk.).

Araneus pulverulentus, Clk. Sv. Spindl., p. 93, pl. IV., tab. 6.

Lycosa rapax, Bl. *Op. cit.*, p. 21, pl. I., fig. 5.

N. Old Earle, Cold Martin Moss, Hedgehope. Common everywhere, running in the sunshine in grassy places. Adult in June. D. Abundant on Widdy Bank Fell.

Tarentula accentuata, (Latr.).

Lycosa accentuata, Latr. Nouv. Dict. d'Hist. Nat., ed. 2,
vol. XVIII., p. 294.

Lycosa andrenivora, Bl. *Op. cit.*, p. 20, pl. 1, fig. 4.

N. Cold Martin Moss, Langleyford, Wooler. D. Ryhope, where a few were taken in June, 1895, at the roots of stunted Furze on the top of the cliff. Adult in June.

LYCOSA, Latr.**Lycosa amentata, (Clk.).**

Araneus amentatus, Clk. Sv. Spindl., p. 96, pl. IV., tab. 8.

Lycosa saccata, Bl. *Op. cit.*, p. 26, pl. II., fig. 9.

N. South Middleton Dean, Wooler district, Langleyford, Cheviot Hill. Very common in woods and on sunny banks. Adult in June. Blackwall's figure is not good.

Lycosa agricola, Thor.

Lycosa agricola, Thor. Rec. Crit. Aran., p. 61.

Lycosa fluviatilis, Bl. *Op. cit.*, p. 31, pl. II., fig. 13.

N. Bardon Mill, Newburn. D. Harperley, near Wolsingham. On sandy and pebbly stretches by the river; common. Adult in June.

Lycosa lugubris, Walck.

Lycosa lugubris, Bl. *Op. cit.*, p. 27, pl. II., fig. 10.

D. Durham, Wolsingham. Common in woods. Adult in May and June.

Lycosa pullata, (Clk.).

Araneus pullatus, Clk. Sv. Spindl., p. 104, pl. V., tab. 7.

Lycosa obscura, Bl. *Op. cit.*, p. 28, pl. II., fig. 11.

N. Cold Martin Moss, Cheviot Hill, Wooler district. D. Durham, Upper Teesdale. Fairly common. Abundant on Widdy Bank Fell on the banks of the streams. Adult, May and June.

Lycosa nigriceps, Thor.

Lycosa nigriceps, Thor. Rec. Crit. Aran., p. 56.

Lycosa congener, Cambridge. Linn. Soc. Trans., vol. XXVII.,
p. 93, pl. LIV., fig. 1.

N. South Middleton Dean, Wooler, Newburn, Bardon Mill. D. Durham, Upper Teesdale, Wolsingham. Common. Sometimes ascends into shrubs, more especially Furze. Adult in summer.

Lycosa herbigrada, Bl.

Lycosa herbigrada, Bl. *Op. cit.*, p. 22, pl. I., fig. 6.

Pardosa herbigrada, Pickard-Cambridge, F. O. Ann. and Mag.
Nat. Hist., Ser. 6, vol. XV., p. 34, pl. IV.,
figs. 2, 7, 8, 10.

N. Wooler, adult male.

Lycosa palustris, (L.).

Lycosa exigua, Bl. *Op. cit.*, p. 29, in part.

Pardosa palustris, Pickard-Cambridge, F. O. Ann. and Mag.
Nat. Hist., Ser. 6, vol. XV., p. 34, pl. IV.,
figs. 6, 7, 8, 12.

Immature examples referred to this species from various localities in North Northumberland. Common everywhere. An acronaut when young, in autumn. The Spider having chosen a point of vantage, emits a thread which floats away in the air even when no breath of air seems to be stirring. When a sufficient length is spun, the Spider lets go and floats away into space.

Lycosa monticola, (Clk.).

Lycosa exigua, Bl. *Op. cit.*, p. 29, in part.

Pardosa monticola, Pickard-Cambridge, F. O. Ann. and Mag.
Nat. Hist. Ser. 6, vol. XV., p. 34, pl. IV.,
figs. 5, 7, 8, 11.

N. Wooler, Cheviot Hill. Females, adult and immature.

FAMILY IX. SALTICIDAE (7 species).**EPIBLEMUM, (Hentz).****Epiblemum scenicum, (Clk.),**

Salticus scenicus, Bl. *Op. cit.*, p. 47, pl. III., fig. 24.

N. Jesmond. D. Durham, Ryhope. Walls and rocks. Pretty plentiful. Adult in summer.

Epiblemum cingulatum, (Panz.).

Epiblemum cingulatum, Cambridge. Spiders of Dorset, vol. II.,
p. 393, pl. V., fig. 6.

N. Wooler, two adult males. D. Durham, Harperley, near
Wolsingham, beaten from Furze. Not common.

NEON, Sim.**Neon reticulatus**, (Bl.).

Salticus reticulatus, Bl. *Op. cit.*, p. 60. pl. III., fig. 33.

D. Upper Teesdale, Ryhope, Durham. Rocks and dry banks.
Adult in summer. Not common.

EUOPHRYS, C. L. K.**Euophrys frontalis**, (Walck.).

Salticus frontalis, Bl. *Op. cit.*, p. 52, pl. III., fig. 27.

D. Durham, in Pelaw Wood on grassy banks. Adult in May
and June. Not common.

Euophrys erraticus, (Walck.).

Attus erraticus, Walck. Faune Franc., p. 46.

Salticus distinctus, Bl. *Op. cit.*, p. 54, pl. III., fig. 29.

D. Durham, in Pelaw Wood, among grass and dead leaves.
Also in Kepier Wood, on the rocks. More frequent than the
preceding. Adult in June.

HASARIUS, Sim.**Hasarius falcatus**, (Clk.).

Araneus falcatus, Clk. Sv. Spindl., p. 125, pl. V., tab. 19.

Salticus coronatus, Bl. *Op. cit.*, p. 50, pl. III., fig. 26.

N. Wooler, an adult of each sex.

Hasarius Adansonii, Sav.

Hasarius Adansonii, Cambridge. Spiders of Dorset, vol. II.,
p. 566.

„ „ Simon. Arachn. de France, vol. I., p. 79.

N. Jesmond, in greenhouses. It has been taken in similar
places in various parts of England, and promises to become
acclimatized.

APPENDIX I.

The following eleven species taken by Mr. Hardy in Berwickshire have not yet been found in Northumberland or Durham :

- Gnaphosa anglica*, Cb. (*Drassus lucifugus*), Blackwall, Spid.
G. Brit. and Irel., p. 105, pl. VI., fig. 62.
Drassus sylvestris, Bl. Blackwall, *op. cit.*, p. 113.
Drassus cupreus, Bl. Blackwall, *op. cit.*, p. 114.
Clubiona brevipes, Bl. Blackwall, *op. cit.*, p. 127, pl. VII.,
fig. 80.
Anyphaena accentuata, (Walck.). (*Clubiona accentuata*),
Bl., *op. cit.*, p. 131, pl. VIII., fig. 83.
Agroeca brunnea, (Bl.). (*Agelena brunnea*), Blackwall, *op.*
cit., p. 159, pl. X., fig. 102.
Asagena phalerata, (Panz.). (*Theridion signatum*), Bl.,
op. cit., p. 205, pl. XIV., fig. 135.
Ceratinella brevis, (Wid.). (*Walckenaëra depressa*), Bl.,
op. cit., p. 306, pl. XXI., fig. 221.
Tmeticus Hardii, (Bl.). (*Walckenaëra Hardii*), Bl., *op.*
cit., p. 293, pl. XX., fig. 206.
Walckenaëra obtusa, Bl. Blackwall, *op. cit.*, p. 294, pl.
XXI., fig. 208.
Xysticus cinereus, (Bl.). (*Thomisus cinereus*), Blackwall,
op. cit., p. 74, pl. IV., fig. 43.

APPENDIX II.

I append a list of the Spiders contained in the "Araneidea of Cumberland and the Lake District" but not hitherto observed in our counties :—

- Hyptiotes paradoxus*, (C. L. K.).
Episinus truncatus, Latr. Eden Valley.
Theridion pulchellum, Wlk. Eden Valley, June.
T. lepidum, Wlk. Tilberthwaite Fells, July.
Taranucus setosus, (Cb.). Newtown Moss.

- Lepthyphantes nebulosus*, (Sund.). Carlisle, two specimens only.
- L. tenebricola*, (Wid.). Eden Valley, one male. New to Britain.
- L. pinicola*, Sim. Helvellyn and Crosslyn Fell. New to Britain.
- L. pallidus*, (Bl.). Eden Valley and Newtown Moss.
- Bathyphantes setiger*, F. Cb. Newtown Moss, May. New to Science.
- Oreoneta nigra*, (F. Cb.). Helvellyn, Sept., 1890; then new to Science.
- Microneta conigera*, (Cb.). Lingmoor Fells, 1,000 feet, one male.
- Coryphaeus distinctus*, (Sim.). Carlisle, one male.
- Nerienne fusca*, Bl.
- Lophomma herbigradum*, (Bl.). Newtown Moss, Elterwater, June.
- Entelecara erythropus*, (Westr.), Carlisle, May and June.
- E. acuminata*, (Wid.). Carlisle, May and June.
- Minyriolus pusillus*, (Wid.). Newtown Moss.
- Lophocarenum Mengei*, Sim. Elterwater, July. New to Britain, 1891.
- Wideria melanocephala*, (Cb.). Elterwater, June. Adult female.
- Maso Sundevalli*, (Westr.). Newtown Moss.
- Ceratinella scabrosa*, (Cb.). Newtown Moss.
- Pachygnatha Listeri*, Sund. Armathwaite, April.
- Tetragnatha pinicola*, L. K. Solway Moss.
- Epeira quadrata*, (Clk.). Eden Valley and heather districts. Adult in October.
- E. Redii*, (Scop.). Tilberthwaite and Coniston Fells, June and July.
- E. patagiata*, (Clk.). Common. Adult in May and September.
- Thanatus striatus*, C. L. K. Newtown Moss, May.
- Clubiona phragmitis*, C. L. K. Solway and Newtown Moss, May.
- Cheiracanthium erraticum*, (Wlk.). Near Carlisle.

- Anyphaena accentuata*, (Wlk.). Eden Valley.
Agroeca brunnea, (Bl.). Eden Valley.
A. celans, (Bl.). Eden Valley. Adult females in April.
Micariosoma festivum, (C. L. K.). Eden Valley.
Argyroneta aquatica, Bl. Newtown Moss and near Carlisle.
Tegenaria campestris, C. L. K. Derwentwater, June.
Hahnia montana, (Bl.). Elterwater, June.
H. helveola, Sim. Elterwater, June.
Pirata latitans, (Bl.). Newtown Moss, June.
Lycosa cuneata, (Clk.). Elterwater, June.
L. spinipalpis, F. Cb. Lodore, May, 1893. Then new to Science.
L. Purbeckensis, (F. Cb.) Solway, May.
L. Traillii, Cb. Styhead Pass, June, 1893. Then new to England.
L. annulata, Thor. Elterwater.
Dendryphantes hastatus, (Clk.) Newtown Moss, May.

Torpedo hebetans, Lowe, or *T. nobiliana* of some Authors.—
 A fine specimen of an Electric Ray, which appears referable to the above-named species, was captured in a Trawl Net about 12 miles off the Durham Coast near Sunderland. It was secured and exhibited by Mr. J. V. Henderson, Clayton Street, where it was seen by Mr. George E. Crawhall, who wished to buy it for the Museum. Mr. Henderson at once kindly presented it to the Museum. It measures from the front of the head to the end of the tail about 27 inches, and in the broadest part 18 inches—the fore part of the body being somewhat circular. This is the first authenticated record of the capture of this fish on the Durham Coast. In the Berwickshire Transactions Dr. R. Embleton records one from Embleton Bay on the Northumberland Coast (see Cat. of Fishes, Trans. of Tyneside Club, vol. X.), and it has been reported from the East coast of Scotland, but is only of rare occurrence in the North Sea.—*Museum, Feb., 1896.*—*Richard Howse.*

ADDRESS TO THE MEMBERS OF THE TYNESIDE
NATURALISTS' FIELD CLUB.

READ BY THE PRESIDENT, THE REV. ARTHUR WATTS, F.G.S., F.R.G.S.,
AT THE FORTY-NINTH ANNIVERSARY, HELD IN THE COMMITTEE
ROOM OF THE NATURAL HISTORY SOCIETY ON THURSDAY, APRIL
25TH, 1895.

LADIES AND GENTLEMEN,—It would ill become me to depart from the universal custom of those whom this Society has honoured by electing them its President. They have all done two things which, therefore, I will do, only begging to be allowed to be as brief as possible in the discharge of the first, viz., to express the consciousness of my utter unworthiness of the distinction of being President of this Club. This I would do more at large did I not observe that in many cases those most worthy have most strongly expressed their unworthiness, and measured by that standard I cannot be too brief. Moreover, to dwell upon this subject would be to put my personal feeling in opposition to that of you, gentlemen, who have so generously done me this great honour.

My next duty is to report the Field Meetings during 1894. As the Committee could find no better places than those already visited during the forty-eight years of this Club's existence, and therefore already described, I will try to avoid useless repetition. Gosforth Lake has been visited once before; Blanchland, twice; St. Mary's Island, thrice; Bamburgh four, Chollerford six, and High Force eight times.

I suppose the nearness of Gosforth explains why it has had only one previous visit. Our visit was paid on June 1st, and we were eight. Happily the day was fine, but the ravages of the late exceptional frost were abundantly evident, and the Rhododendrons were not yet in flower. So exceptional were these frosts for intensity and continuity that their record deserves preservation. Thermometric readings in our neighbourhood were:—May 20th, five degrees of frost; 21st, ten; 22nd, nine; 23rd, eight; 24th, four; and 25th, one degree of frost.

Two parties left Newcastle, the earlier by the 10.25, the later by the 1.30 train to Killingworth. The latter party had the good fortune to fall in with Mr. E. C. Britten, manager of the Gosforth Park Company, who spared no pains to make the visit pleasant. Guiding us through the park, first he showed the rooms of Old Gosforth House, 1757, the home of the Brandlings, where the silken wall-hangings, richly moulded and frescoed ceilings, mahogany and rosewood doors, old staircase, and especially a fine marble mantel-piece with groups of cherubs in high relief blowing up the fire, were duly admired, and afterwards, the best views of park, lake, and adjoining country, from the grandstand. We then broke up into little groups, wandering at will, by lake, through wood or park, listening to call of Cuckoo, song of Blackbird, or cry of wildfowl, enjoying the sunshine and returning evidences of life and activity, till evening called us by various routes back to Newcastle. The sedgy borders of the little lake, the silver gleams of water through the gaps, and far out in the shallow lake the white patches of *Ranunculus aquatilis* satisfied the artistic eye, as did the presence of numerous wild-fowl that of the Naturalist. Two couples of Tufted-ducks, two Black-headed gulls in full plumage, many Blackbacks and hosts of smaller birds were seen, whilst five Coots' nests were found, two with birds sitting close, one with six, another four, and one without eggs. As a breeding place Gosforth Lake is a diminutive, and I fear degenerate representative of that olden paradise of the Naturalist, Prestwick Car. The proprietor of the hotel said he got last year from his domestic fowls 22,000 eggs. If others copied him we should import fewer. At the keeper's lodge 200 Pheasant chicks were seen.

Our SECOND FIELD MEETING was in upper Teesdale, June 27th and 28th. The first day eleven were present, the second fourteen, and two happier or finer days would be hard to find. The rendezvous was the High Force Inn, which was mostly reached by brakes from Middleton. The first day, at 10 a.m., two brakes took the whole party through Langdon Beck to West Cow Green toll-bar, whence all walked over the fell to Cauldron

Snout; thence four proceeded onwards, with excellent guides in Mr. F. Spence and Professor Potter, to High Cup Nick, and the remainder returned to High Force by Falcon Clints and Langdon Beck. The second day six re-visited the Snout and Falcon Clints in charge of Mr. Spence, five in charge of the President followed the Tees from the Force to Langdon Beck, whilst other three confined themselves to the neighbourhood of the Falls.

What Botanist can ever forget the sweet pyramids of snowy Hawthorn, or fields strangely gay with *Geranium sylvaticum* (not *pratense*) that greeted us between Middleton and High Force; the meadows yellow with Globe-flower between High Force and Langdon Beck; the open moor brightly diapered with the Cystus or Rock-rose and Wild Pansy as Cauldron Snout was reached; the streamlets fringed with the charming Bird's-eye Primrose, tufts of Bladder-fern, and Black and Green Spleenwort; the bogs starred with witching Saxifrages; or the sharply sloping fells, with their nodding heads of Cotton-grass, that lay beyond the Snout?

Who can ever forget the first morning peep up the fir-clad and buttressed avenue to the foaming waters of High Force;—the view, after the toll-bar is passed, over the lake-like Wheel away to Cross Fell and its big neighbours;—the curious mixture of feelings as one looks down from the little bridge on the mad waters rushing down that giant staircase called Cauldron Snout; or above all, that marvellous panorama that opens out so magically when the head of High Cup Nick is reached and the valley of Eden lies spread at one's feet?

What Geologist can see the organ-like crags by Holwick; the castellated avenue to High Force; or the long serrated line of the Falcon Clints ending at Cauldron Snout; still less that wondrous V-shaped cleft at High Cup Nick, showing on each side the dark, columnar basalt with horizontal bands of limestone over and underlying it, and isolated stacks and chimneys fringing its outcrop, and forget it?

Who wants to forget the exquisite pleasure when the first patch of Bog Asphodel was sighted or the curious Moonwort

secured; or the involuntary cry of delight when, the Juniper wood passed, that long line of bushes, half in, half out of the water, proved to be the eagerly sought *Potentilla fruticosa*; or the mad rush after the startled Partridge chicks, checked by the intense concern of their crafty mother; or the shrinking eagerness with which the first Lizard was seized; or the speculative interest with which those two heaps of feathers were examined by one of our worthy Secretaries? Not I. But this is poetry, perhaps you are saying, and Naturalists want prose. Well, poetry or prose, it is life; and such are among the purest pleasures of life. Even now I look up, as I write, at the whitened skull of a ram, near me, and at once see a heap of bones on an open moor, and near by a black little pool of clear water set in a glorious emerald frame of Sphagnum and other mosses, and starred where the waters bubble as they rise, with dainty white or speckled-white blossoms of Saxifrage. I am in a fairy-land, though truly only recalling one scene midway between the Snout and the Nick.

How came this Nick? The whole conditions and lie of the land say, not wholly by river action but, perhaps, primarily by marine denudation, subsequently by glacial action, and finally by running water. For, *First*, from the Snout to the head of the Nick is a rising slope; the Nick's extension has shortened and is shortening the basin of the eastern-flowing streams, so it is impossible for a bigger stream to have formerly flowed through the Nick-valley westwards. *Second*, the spring and insignificant burn in the valley emphasizes this. *Third*, the parallelism of the rocks on either side forbids the idea of earthquake action as the cause; and *Fourth*, the fiord character of the west coast of Scotland so harmonizes with this Nick and neighbourhood that it seems a natural extension of that coast, when the Cumberland hills were islands, and the Permian and later beds of the Eden valley were being laid down between them and the Pennines. Have raised beaches been sought hereabouts or moraines and other glacial signs found?

A very fine rolled *Stigmaria* was found by us in Maize Beck. Our chief botanical finds were *Tofieldia palustris* on Widdy Bank

Fell; *Antennaria dioica*, between the Snout and Maize Beck; *Habenaria albida*, above the Force; *Viola lutea*, near the toll-bar; *Salix phylicifolia*, var. *radicans*, a dwarf Willow in flower and fruit, in the Basalt river-cliffs near the Juniper wood, above the Force, and also a native dwarf Poplar in the same place. Besides these, *Potentilla fruticosa*, *Polygonum viviparum*, *Bartsia alpina*, *Rubus chamæmorus*, *Myrtis odorata*, *Helianthemum vulgatum*; many Orchids, *Listera ovata* (not *cordata*), *Habenaria bifolia* and *H. viridis*, *Gymnadenia conopsea*, etc., and of course *Primula farinosa*, *Trollius Europæus*, *Saxifraga aizoides*, etc., *Butterwort*, *Spleenworts*, *Moonwort*, and other ferns, but *Gentiana verna* was not found.

Again, the results of the severe May frosts were only too obvious. The earlier trees were badly frost scorched; Sycamore worst, then in order, Chestnut, Beech, and Oak. The Ash alone went unscathed, its leaves were not yet out. Two Grouse nests were found with addled eggs near the Nick, and the skeletons of several sheep. Curlews piped, strutted, and peered down at us; Dippers showed their white aprons; Dunlins, Sandpipers, Green and Golden Plovers, Grouse, and occasionally Wheatears showed themselves. Two Corncrakes appeared to have fallen victims to Hawk or Weazel, of whom one of each was seen, as also a covey of young Partridges. Three Lizards were caught.

Our THIRD VISIT was to Blanchland, Thursday, July 19th. Again the weather favoured us. Our party was twelve, an ideal number for such excursions. The baneful influence of the May frosts was again seen on all sides in a weird mixture of autumn and spring effects, bright green leaves crowning withered ones. It is perhaps worthy of note that the trees near Shotley Bridge suffered more than those on higher land. Shotley Bridge was the trysting place, whence we drove, first, over well-wooded hill and dale, then over bleak open moor, where heather-bells were just opening, down into charming Blanchland, the whole way being illuminated with such a wealth and variety of Roses as only the "North Countrie" can show.

At Edmund Byers we rested and baited horses. There the

Rev. W. Featherstonehaugh joined us and rendered invaluable service botanically and archæologically. Church and garden were explored under his guidance. It is evident he loves both, and has bestowed on his neighbourhood a sylvan character that will prove a perennial delight when mayhap the bestower is forgotten. His garden is a veritable treasury, and he was lavish with his treasures, root and flower. On his walls a Swiss wanderer, *Erinus alpinus*, grows perfectly at home. Who will ever forget that first glimpse of amphitheatred Blanchland, and the varying views as we wound down the steep hill to the picturesque bridge? It is hard to say whether Blanchland is prettier at a distance or near, and whether the Lord Crewe Arms is more attractive archæologically or gastronomically. Most of our party were content to stay and admire the architectural beauties of monastery, church, cross or bridge, and dream of Scotch reivers or Dorothy Forster till dinner was ready, but a small party of three pursued the Derwent as far as a mass of Millstone grit, yecept Gibraltar, through a charmingly wooded dale, where mud, tangle, and wreckage showed what a spate can do. Hunstanworth quaint church was peeped at, *Habenaria bifolia* gathered, and a general conclusion reached that the floral beauties of upper Teesdale far exceed those of upper Derwentdale.

By various routes and at various times a small party of nine gathered at Bamburgh, on Wednesday, August 15th, for the FOURTH EXCURSION. We noticed, with pleasure, the stations made gay by flower-beds and rock-work, and feel that the railway directors are doing a good work in offering prizes for the best kept stations; good to their employés, good to the public. As the day was showery vehicles were obtained, and all drove to Spindleston Mill for Spindleston Heughs. Alighting and walking round the picturesque basaltic crags to the quarry, we climbed the crags, startling several white rabbits, to Outchester Camp, a fine intrenchment, whence admirable land and sea views were enjoyed till the returning rain blotted all out. Hastening to the vehicles Budle Bay was soon reached, and the ridge which

hid Bamburgh from view being surmounted, unrivalled scenes broke on the eye; forwards was queenly Bamburgh, seawards Holy Island and the Farnes, landwards Kyloe Hills and distant Cheviot. Bamburgh reached, the party broke into two sections, Birds, rocks, and plants afforded gratification to some, whilst castle, church, and priory garden proved more attractive to others. The latter revelled in the company of Ida and Oswald, Aidan and Cuthbert, in myth and legend of the Laidley Worm and Bamburgh Toad; recalled the adventures of the Forsters, especially Dorothy; saw with regret the tomb of Grace Darling shattered by last November's great wind-storm; watched with interest the excavations Lord Armstrong is making under the watchful supervision of Professor Hughes of Cambridge, and heard with delight that a coin was just found. This small coin proved to be a Saxon styca of the reign of Eanred. Other things found were a spindle-whorl; a sinker of garnetiferous gneiss; bones of deer and domestic animals; oyster, mussel, limpet, and winkle shells in the lowest midden layers, with coal and cockles also in the upper. Outside excavations in the Bowl Hole (Burial Hole), a traditional Danish cemetery, proves this to have been earlier a British burial place. The circular enclosure by large boulders, the depth of the graves, the position of the interred bodies doubled up and resting on the left side, besides the brachycephalic skulls, point to no other conclusion.

After dinner, at the Victoria Hotel, the President showed a fine orange-and-black-banded Carrion Beetle, *Necrophorus ruspator*, and its nest with six young grubs (not a rolled ball with a single grub). The nest was a sphere of about one and a half inches diameter, made of fibres of horse-dung matted into a felt, and lying in a round hole formerly occupied by a mouse nest. It was found August 1st in the Rectory Garth. The mother kept guard outside the nest and near its aperture, which was small and uppermost. Three very large mushrooms reminded Mr. Thompson of Mr. Cobb's queer mushroom bed, found last month, under the glass foot-light to a cellar, close to Sunderland Central Station. The first crop yielded twelve, a second ten; several were three inches across, all full of moisture and equal

to any he has tasted, yet these grew in old mortar and with no accessible moisture except the vapour of the air.

THE FIFTH MEETING was at Chollerford, September 11th, when eight were present. It was a lovely day and the Botanists had a good time. They found *Erinus alpinus* still blooming on the ancient Roman masonry in Chesters Park, and *Corydalis lutea* in full flower in the same neighbourhood, besides Wall-rue and Black Spleenwort. Four varieties of St. John's Wort, viz., *Hypericum pulchrum*, *quadrangulum*, *hirsutum*, and *perforatum* were gathered, and Mr. Cobb found a curious specimen of Liverwort, *Marchantia polymorpha*, with its umbels borne not on green but black stalks. But the find of the day and of the season fell to a visitor, a friend of the President. It was a lovely little ivy-leaved Saxifrage, bearing single pale yellow flowers with a dark yellow patch at the base of each petal, carried erect on a scape with one or more bracts near its base. The leaves were bright green and many were trefoiled. It was identified by the Curator of the Royal Botanical Gardens, Kew, as the *Saxifraga Sibthorpii* of Bois, a native of Greece, and found in Great Britain once before only, in Argyllshire, as a garden migrant. It is not easy to see how it could stray from a garden to the spot where it is now growing quite freely and abundantly. From its numbers it must have been established in this habitat some time. I sent my best plant to Kew, but still have a tuft of thriving young ones.

On reaching Chollerford Bridge the party divided. Most followed Mr. Thompson to the excavated Roman station of Cilurnum in Mr. Clayton's grounds at the Chesters, and looked with wonder on a walled town that throbbed with life nigh 1500 years ago, as seen in its wheel-worn gateways with guardrooms attached; in its narrow, guttered streets crossing each other at right angles; in its hypocausts, flues, and cement floors, showing carefully warmed and ventilated houses; in its Forum and Treasury inside, its villas, cemetery, and baths outside the defending walls; in its pottery, glass, and metal-work, drain-pipes and sculptured columns, indicating an advanced civilization, alongside tusks of wild boar, antlers of deer, and weapons of stone.

The smaller party drove by Walwick to "Procolitia," the next station westwards on the Great Wall at Tepper Moor, seeing on the way a fine piece of the wall and the remains of two turrets. The whole party reassembling walked down the North Tyne through a wealth of wild-flowers, Golden-rod, Ragwort, Figwort, etc., to the Roman Bridge, where they listened to a short account, given by the President, of the Great Wall, its military stations, its castles, turrets, and bridges. Point was given to the sketch by the presence at this spot, of the best revealed station, an excellent mile-castle, a portion of the wall and the eastern abutment of the Bridge of "Cilurnum," perhaps the finest piece of Roman masonry in the kingdom.

All then dined together at the George Inn, when Mr. Thompson exhibited a Tree-Creeper's nest of six eggs, prolonged by a mass of fibres and splints of decayed wood to the length of a cigar-box, and the President reported that *Lysimachia vulgaris* had been found by his friend, the Rev. J. E. Hull, in Pelaw Wood, Durham, a new habitat.

For an account of the LAST MEETING I am indebted to Mr. Thompson and Mr. Branford, as ill health forbade my presence. It was at St. Mary's Island, on Friday, October 19th. They say:—We had a pleasant day on the whole, though caught in some heavy showers. There were eight of us. Two, who by mistake went a week before, saw a stranded Porpoise. From Hartley Station the party walked by the Avenue to Seaton Delaval Hall, where a pleasant hour or so was spent, and then on to Seaton Sluice, where the cutting in solid rock 52 feet deep, 30 broad, and 900 long, executed by Sir John Delaval, was inspected. St. Mary's Island reached, tea was had and the Island explored. Walking by the seaside Whitley was reached, and by train, Newcastle, 6.45. At St. Mary's Island, Mr. Jesse Ewen and his brother captured, on August 23rd, a seal alive. After a few days' captivity it died and its body was sent to our Natural History Museum at Newcastle, where it may be now seen. The day before our visit a glass bottle was cast up, with two rosettes of barnacles, *Lepas fascicularis*, attached to it.

These, on being put into water, revived, and their movements afforded a sight few had seen before. Mr. Cobb has preserved them. In all there are over a hundred, the largest being about an inch long. Mr. Thompson exhibited five eggs taken out of a nest of the Black-headed Gull, *Larus ridibundus*, near Eskdale, last May. The usual number is three, but Mr. Thompson has seen four, though never five before. Large flocks of Starlings were seen on the way to Whitley. A berried branch of Buckthorn, *Rhamnus catharticus*, from Westmorland, excited some curiosity.

Two joint EVENING MEETINGS of the members of the Natural History Society and the Tyneside Naturalists' Field Club were held in the Museum of the Natural History Society, Newcastle-on-Tyne; the first, on January 31st, 1895, to hear a paper by the President of the Tyneside Naturalists' Field Club, the Rev. A. Watts, F.G.S., on "The Life-history of Coal;" and the second on February 22nd, 1895, to hear one by Prof. G. S. Brady, F.R.S., on "Entomostraca collected in the Solway District, and at Seaton Sluice, during the summer of 1894." At the last meeting several Queen White-Ants and other insects from South Africa, presented by Mrs. Gethin, were exhibited, and a fine specimen of the newly-discovered South Australian Marsupial-Mole, recently presented to the Museum by Mr. F. Sutherland. It is to be hoped that these Winter Evening Meetings will be continued.

A melancholy duty now falls to me. Whilst our members' list shows new names, alas! some old ones, venerated ones, are year by year disappearing. 1894 has borne away two, in the Rev. John Cundill, D.D., who died September 14th, at the ripe age of 84, and in Charles Murray Adamson, Clerk of the Commissioners of Taxes in Newcastle, who died November 19th. Both names are found on our first list of members, that for 1847. Canon Cundill was an authority highly respected on Ecclesiastical Law, but does not seem to have been a very active Naturalist. He was made Honorary Canon of Durham, and only a few years ago

resigned the Rectory of St. Margaret's, Durham, from failing health. He has the distinguished honour of being not only the first Principal of the Training College for Schoolmasters in Durham and Northumberland, but the first Principal of any Diocesan College in the kingdom. He bore a large share in the development of Elementary Education in this northern province. I remember, with gratitude, when I was seeking Holy Orders, he was the first to offer me a title.

On the other hand, Mr. C. M. Adamson has been from the first a most active member of our Club and has done excellent work. The great Naturalist, Audubon, was among his father's friends, and inscribed in Audubon's second volume we read—"To John Adamson, Esq., etc., etc., with the best wishes of his faithful friend, John T. Audubon," Newcastle-on-Tyne, December 17th, 1834." Audubon wished to take his young friend with him to America, but his father objected, as he feared it would unfit him for the rest of his life. Audubon gave him eggs of the Great Northern Diver, etc., perhaps to take the edge off his disappointment as well as to encourage his budding taste. What wonder that with such a father and such a friend Mr. Adamson loved birds? He has left us two books, the first, "Sundry Natural History Scraps, more especially about Birds," 1879; the second, "Some more Scraps about Birds," 1880-1. He set up his own birds and made his own sketches. His first book consists mostly of reprints from the "Field," with two reprints from our Transactions and some original articles. One is of special interest, that on Prestwick Car. He says:—"My collection of wading birds contains many specimens shot there." His list of birds that bred at Prestwick Car makes one's mouth water. This and Holy Island were his favourite spots. Other articles of peculiar interest are:—One on the Colour of Birds' Eggs; another on the resemblance in Note and Song of different kinds of Birds; and another on the Protection of Wild Birds. His notes on some of those kinds of foreign birds, which have been described as having visited England, are very good, especially his anecdotes on Spotted Sand-pipers. An obituary notice justly says:—"with credit to himself and satisfaction to all

concerned he discharged the duties which fell to him up to the time of his death." May his mantle fall on a worthy successor!

A YEAR'S WORK WITH POLLEN.

PLATES 4 AND 5.

By way of showing how every member of our Club may acquire much true Natural History, by a systematic use of leisure moments, I propose to place before you the result of observations made in one year, 1887, by myself (but which press of parochial work has delayed being focussed till this year, 1894), in the hope that others may find as much pleasure and profit as I did. This may not be worth much, but I venture to think, honest, earnest work is never absolutely worthless, and this can at least claim to be both. Pollen was chosen from the simplicity of its structure. The kinds examined were 494. The instrument used was a microscope with low power magnifying about 60 diameters and high power about 258.

To understand pollen we must look at its source. This is what is called a flower. Flowers are usually borne on branch or stock, though sometimes on apparent leaves, as in the *Rheedias*, where the tiny florets are seen on their margins. Truly, a flower is a group of leaves modified for the special purpose of reproduction. We may call a flower a stunted branch, and the parts of a flower modified leaves. Double flowers are made by changing reproductive organs back into modified leaves, hence perfect double flowers can produce no seed, and are monstrosities. The essential parts of a flower are stamen and pistil. Petals, sepals, nectaries, etc., are accessories either attractive or protective. The true reproductive organs are generally found together in one flower, but either may exist without the other, and then we have the simplest flower. That reproductive organ which produces ovules and seeds is the pistil, and is called the female organ; the stamens produce pollen and are called the male organs. Pollen is that coloured dust shed in a full-blown flower from the anthers.

Our attention now narrows to these anthers. The essential

of an anther is one or more lobes, but usually there is also a stalk or filament. Anthers may be truthfully called staminal leaves, the lobes or pollen sacs being formed by foldings of the halves of the leaf-blade; the filament and connective being the midrif. The filament may be wanting, when the lobes become sessile; or prolonged beyond the lobes, as in *Herb Paris*; but it usually ends at the lobes in the connective. Occasionally the lobes are apart, on equal branches as in *Hornbeam*, or unequal as in *Salvia*. Most anthers have two lobes, and each lobe one or two sacs or loculi, so that most anthers are either quadrilocular or bilocular. Very rarely four sacs are found in one lobe. Many anthers in an early stage of development are quadrilocular, but when mature become by absorption bilocular. The flowering rush is quadrilocular throughout. Others are bilocular in an early stage, and later become unilocular as the Milkworts. In ordinary Angiosperms when the anther is mature the pollen lies in separate grains in the four loculi, and falls out when the anther opens, as it does in various fashions.

When the anther is mature and the pollen falls out, it reaches in various ways the female organ and produces therein fertilization. The act of conveying pollen to the Angiosperm stigma or Gymnosperm naked ovule is called Pollination. It may be secured by wind as with the *Coniferae*, many forest trees, and cereals generally; or by insects or birds as with Orchids, *Vanilla*, etc.; or by mechanical means or movements on the part of the flower itself, as in *Berberis* by irritability of stamens; in Grass of Parnassus, by successive elongations of stamens; in *Urticaceae*, by a sudden bursting of the anther; in *Epipactis*, *Oncidium*, and other orchids, by a bending forward of their pollinia, so that they stick by their rostellæ to the heads of bees and other insects; by trapping within the flower an insect, as in *Aristolochia Clematidis*; by floating of the male flower, as in some aquatic plants and by various other ways. Often the act of opening the flower lips to enter for honey leads to a sudden discharge of pollen. Thus *Melampyrum sylvaticum*, *Lamium purpureum*, and the Greenhouse *Genista* exhibit this amusing phenomenon, that when the base of the flower is lightly pinched

so as to make the lips of the flower part, out flies suddenly the pollen. When an insect, therefore, visits such flowers and intrudes between the lips he is pelted with pollen grains, if *Melampyrum* with white pearls, if *Lamium* with a golden shower, if *Genista* with clear transparent ovals, and thus some are sure to get carried elsewhere to answer the purpose of their being. Indeed this is true of most, if not all, of the *Scrophulariaceæ*, *Labiataæ*, and *Leguminosæ*. Lastly, pollination may be secured by Cleistogamic flowers where self-fertilization is a necessity, as in the after-flowers of Violet and Pansy.

The purpose of pollination is fertilization, that is the transfer of the contents of the pollen grains through the tissues of the stigma and through the micropyle of the Oosphere, whereby the Oosphere is changed into the ovule and the production of a seed becomes possible. This transfer is secured by the development of pollen-tubes from the intine of the pollen grains. The transfer may be completed in a few hours, a few days, or it may extend over weeks, and with some Orchids, even months. In some of the latter plants the development of the ovules does not even begin till pollination has taken place. These pollen-tubes are usually short, but may reach a length of two inches, or in extreme cases more. There may be more than one pollen-tube from one pollen-grain, but the number is fixed, being always the same in the same kind of pollen, though all possible are not always developed. The number of pollen-tubes that start to grow from one grain may be one, two, three, four, six, or even more. The contents of the largest cell which develops within the pollen grain passes down within the growing pollen-tube, ever keeping near the growing point, till finally it becomes mixed with the cell contents of the Oosphere or Embryo-sac, which completes the act of fertilization.

The way is now clear to consider the pollen itself. An ordinary pollen grain is a free-cell, consisting of double cell walls and certain cell contents called collectively the Fovilla. The outside wall is called the Exline, the inside wall the Intine. These two coats may be readily separated in *Thunbergia alata*. The fovilla consists of Protoplasm and Cellsap. The protoplasm

contains one or more Nuclei, each with its Nucleolus. This nucleolus is the very citadel of life, the nucleus is its castle, the surrounding protoplasm its commissariat, and may be skirmishers as well as foragers. A word or two on cell growth, and especially on free-cells. The fundamental unit of every organic body is a cell. Therefore the simplest living being is a single free-cell. The highest animal or vegetable is simply an aggregation of cells.

Pollen grains always consist of isolated cells. Free-cell formation does not usually occur in ordinary vegetable growth but is intimately connected with reproduction, and is therefore well seen in the growth of pollen and of its allies, Swarmspheres, Antherozoids, etc. The Swarmspheres of the Algæ are primordial cells, that is naked protoplasm, as are the Antherozoids of Cryptogams. The Antherozoids are endowed with motion, and so reach and fertilize the Zoospheres or Spermatozoids. In the higher Cryptogams the Microspores represent the pollen of the Phanerogams, as do the Macrospores the ovules. The Sporangium of a Vascular Cryptogam therefore answers to the Pollen-sac of a Phanerogam. It is a pretty sight to watch the antics of the brown Antheridæ or spores of *Equisetum arvense* as they are being examined under the microscope. Each spore is furnished with four elators, eminently hygroscopic, and therefore every breath of the observer causes the spores to leap about the glass slip. Pl. 4, f. 31.

As the Phanerogams embrace both Gymnosperms and Angiosperms, the Gymnosperms forming the link between Cryptogams and Angiosperms, it will be seen that all Phanerogams are not true pollen bearers, but only the Angiosperms. These include all Monocotyledons and Dicotyledons, which are the true pollen producers.

The pollen they produce varies greatly in mode of production, condition, grouping, shape, size, colour, and markings, but these variations are astonishingly persistent, not only in species but in genera and orders; indeed, so much so, that the order or even genus of a plant may in many cases be certainly known from an examination of its pollen. Any marked departures may there-

fore well raise the question—"Are such plants placed in their true Natural Order? A study of pollen may therefore assist classification.

PRODUCTION OF POLLEN. The pollen lies within each loculus, at first a solid mass. This mass soon becomes cellular, and the cells speedily develop into large mother-cells. Usually the mother-cells divide, either at once or at twice, into four daughter-cells, which become free by the more or less perfect absorption of the primal wall of the mother-cell. These free-cells now lie in the granular fluid of the anther loculi, which they gradually use up, so that when mature the loculi are filled with a powdery mass of pollen grains. This is the normal mode of production in temperate regions, but there are numerous deviations. Thus, the primary mother-cells may be followed by secondary, tertiary, and other mother-cells before the final stage is reached; the mother-cell wall may be only partially absorbed, leaving strips of cell-tissue or masses of gelatine or gum; the mother-cell wall may remain whilst the daughter-cell walls are absorbed, when the pollen will not be simple grains but aggregates, usually of fours or threes. Hence pollen grains may be simple or compound. They are mostly simple. The absorption of the mother-cell walls may be only partial, for in absorption the cellular tissue first passes into mucilage and then disappears. The absorption is therefore imperfect when gum or wax remains, equally as when strips or shreds are left. Degeneration of the walls of the mother-cells actually produces dry threads or chains, moist fibres, or a sticky mass;—tufts of dry hairs or threads in the *Fuschias*; brittle and cellular-looking fibres, like delicate branching zoophytes, in *Lavandula vera*, or like strings of beads in *Celosia cristata*; whilst in the *Epilobiums* and *Ænothera biennis* they are so numerous, long, and pliant, that the pollen grains hold together in felted masses. In other cases the threads are distinctly sticky, as in the *Arums*, *Azaleas*, *Heaths*, and *Imentophyllums*, where the pollen can be lifted out of the ripe anther-sacs in strings, whilst in *Passiflora cærulea* the pollen leaves the anther-loculi in two rod-like strips, which, being reddish, show up well on the yellow anthers. Tropical and

sub-tropical pollen is mostly sticky, as in the Euphorbias, Tobaccos, and Poinsettias. That of *Hedychium coronarium* exudes from the anthers in glutinous streams, and the pollen grains of *Cypripedium insigne* and *Rhyncospermum jasminoides* lie embedded in a glutinous matrix.

The formation of the daughter-cell walls takes place simultaneously over the whole surface, so the daughter-cells lie, with their own walls, quite free, within the wall of the mother-cell. The pollen of *Dielytra spectabilis* affords good examples of such mother- and daughter-cells. The mother-cells of Monocotyledons divide after a different fashion from those of Dicotyledons. In the former a mother-cell divides into two, and each half again into two, in the same plane, giving a discoid form; whilst in Dicotyledons and the higher Cryptogams the division takes place in two planes at right angles to each other, yielding therefore a cubic or tetrahedral form.

CONDITION OF POLLEN. A pollen grain must contain protoplasm, which may be naked, as in the Algæ and Cryptogams, but which is usually enclosed by a double wall of cellulose, the Intine and Extine, as in the Phanerogams. The inner wall, or Intine, is generally a complete cellulose sac, smooth and clearly defined outwardly, though it may have inner thickenings which merge imperceptibly into the protoplasm. This Intine retains the power of growth, and of its own cellulose can build up pollen tubes. Sometimes the Intine thickens and protrudes through the Extine at certain spots, as in *Cuphea platycentra*, whilst in others there is an Extine lid as in *Passiflora cærulea*. The number of these spots is always definite, not only in species but even in genera and families. Sachs says, "In most Monocotyledons and in a few Dicotyledons there is only one; in *Ficus*, two; in *Onagraceæ*, *Cupuliferaæ*, *Geraniaceæ*, *Compositæ*, and *Boragineæ*, three; in *Impatiens*, *Astrapæa*, *Alnus*, and *Carpinus*, four to six; in *Convolvulaceæ*, *Malvaceæ*, *Alsineæ*, etc., numerous."

The outer wall, or Extine, may be an entire sac or a mere enclosing network of cellulose which has passed into cork, with meshes small or large, and threads fine or coarse, regular or

irregular, smooth, toothed or beaded, presenting an almost endless variety of aspect, and giving great beauty of form and tracery to the grains. Some of these projections certainly answer some functional purpose, thus the Anemophilous pollen of Pines and of some other *Coniferæ* have two vesicular hollow bodies which help their flight.

Pollen cells are not generally filled with protoplasm, indeed usually the protoplasm merely lines the inner face of the Intine, throwing bridges or plates from side to side of the cell, through the cell-sap which distends the cell-walls. The Intine during the process of fertilization protrudes through either an orifice or a thin place in the Extine, and develops the fertilizing pollentube by which the protoplasm and cell-sap forsake the cell, which then dries up, and passes to its "Ultima Thule," the ovule.

The Extine is outwardly rarely smooth or even, but is generally striated, ridged, sculptured, or ornamented with projections very varied in form and size. Whatever character the outer surface of the Extine presents is clearly dependent, partly at least, on the mode by which the pollen is to be conveyed to the female organ, or whether cross-fertilization or self-fertilization is desirable. All externals of the Extine, except perhaps pure ornamentation, must be looked upon as accessories to the final purpose of the pollen, although their exact duties cannot be assigned them in every case. Those which are wind-borne, anemophilous, or fall through the air, are angular, very dry and often smooth, as *Quercus Robur*, *Aconitum Napellus*, *Poa pratensis*, and Irish Yew. Others shine like glass beads or polished silver, as *Viola odorata*, *Corydalis lutea*, *Allium ursinum*, and *Cyclamen*, which are probably more independent. Some even which are prickly, look as though they were glazed, as *Cucurbita ovifera*. The common occurrence and great variety of prickles may be taken as proof that they play an important part in securing pollination. Thus those that are insect-borne, entomophilous, possess either hairs, as the Ragworts, Campanulas, Cacti, etc.; or coarse prickles or spines, as Coltsfoot, Dahlia, Sunflower, and the *Compositæ* generally; or if massed, have a special secretory organ, as the *Rostellæ* of some Orchid pollinia like *Oncidium*

variecorum; or the grains themselves are sticky, either from an uniform secretion or from local drops, thus *Abutilon venosum* has tiny drops, *Euphorbia splendens* gelatinous ovals, *Wistaria Chinensis* clinging masses. Most pollen is more or less soft, but that of some Orchids is not only dry and hard, but brittle like resin, as that of *Calanthe lutea*.

GROUPING OF POLLEN. Pollen is either simple or compound, usually simple. As a rule the compound are groups of four grains, or multiples of four. Occasionally one grain of a group may remain rudimentary, hence threes, sevens, etc., are met with. Such must be looked upon as exceptions.

Groups of pollen are the grains of one or more mother-cells. Though groups of four may be taken as normal, in the Acacias the sub-division is carried far beyond, to eight, twelve, sixteen, thirty-two, and even sixty-four; and probably often in such polygonal pollen as that which is characteristic of the *Caryophyllaceæ*, as *Stellaria* and *Dianthus*. Indeed any part, or even the whole contents of an anther-sac may remain united in one mass, pollinia, as in *Orchis maculata*. The Orchids, in fact, present every phase, from separate grains to pollinia; thus, separate grains, *Cypripedium*; four-fold groups (mother-cells), *Neottia*; all the pollen of a primary mother-cell, *Ophrydæ*; all the grains of one pollen-sac and even of an anther head, *Oncidium*, *Habenaria*, and *Dendrobium*. Similarly the sporangia of ferns exhibit often masses of spores, as *Adiantum capillis-veneris* and *Davallia pyxidata*.

Not unfrequently pollen grains from the same anther appear of two sizes, as in *Spinacea oleracea*, the larger being about sixteen times the bulk of the smaller. The smaller are single cells, the larger are mother-cells. *Potentilla anserina* also shows two sizes, the larger being groups of four, just as *Symphytum officinale* has often double grains. The Crocus and Scabious similarly present two sets occasionally.

A few examples of the various modes of division by which groups are formed may perhaps prove acceptable. *Melampyrum sylvaticum* shows longitudinal division into two, splendidly, as *Bunium flexuosum* and *Pulmonaria officinalis* do by transverse

division. *Epipactis latifolia*, *Cestrum aurantiacum*, *Anthyllis vulneraria*, and *Epilobium angustifolium* show division into fours; whilst eights may be found in *Dielytra*, *Rubus cæsius*, and *Rumex obtusifolius*. Some always present groups of three to the observer, as *Vaccinium myrtilis*, *Erica cinerea*, *Azalea*, and indeed all the *Ericaceæ*, of which this mode of grouping may be considered characteristic. Some of the apparent threes are really fours, being tetrahedrons. The long ovals of *Jasminum officinale* are occasionally seen in groups of three, whilst some of the *Malvaceæ* appear trebly grouped in threes.

Sometimes among normal grains appear certain trefoiled grains yet of normal size. These may be either imperfectly developed or arrested mother-cells, or the three notches which cause the appearance may indicate the places where the pollen tubes ordinarily start. Of the former *Euphorbia splendens*, *Sedum occidentale*, *Ilex aquifolium*, *Oxalis acetosella*, and *Rhinanthus Crista-galli* may be quoted; *Geranium pusillum* and *Bryonia dioica* of the latter, but in connection with this last it must be remembered a triangular form is peculiar to the *Cucurbitaceæ*.

SHAPE OF POLLEN. Pollen grains present great variety of shapes, though each kind has its own form. The commonest are spheres, ellipsoids, and solids presenting four or more facets. Less common forms are cylinders and discoids; whilst cones and spirals are rare. A few forms are difficult to class. The ellipsoids vary greatly; some are fairly regular, more are ovoid and grain-like, others are drop-like or heart-shaped. The spheres, of course, invariably appear as circles; the ellipsoids as either ellipses more or less regular, or as circles; the tetrahedrons, having four facets, as triangles; the cubes and parallelopipedons, having six facets, either as squares, rhomboids, or rectangles; whilst those solids with eight or more facets always appear as polygons, more or less regular. The cylinders may appear as circles, unequal ovals, squares, or rectangles; discoids as circles, ovals, or narrow rectangles; cones as circles, irregular ovals, or triangles, according to aspect. Considerable care is therefore needed in deciding the true shape.

Of the 494 varieties examined, about 45 per cent. were ellip-

soids; 21 per cent. spheres and discs; 11.5 per cent. rectangular bodies; 11 per cent. polygonal bodies; 7 tetrahedrons, and 4.5 were unclassified.

The two first, embracing 66 per cent., seemed to indicate that the normal shape must be sought in ellipsoid or sphere. Now, pollen is spherical whilst within the anther cell, and elliptical when it becomes free. Whilst examining the recently-shed pollen of *Sarothamnus scoparius* one day, to my astonishment I saw in a few seconds some of the spheres change into ellipsoids, and in about two minutes not a sphere remained. On gaining perfect freedom an unequal tension was evidently able to assert itself. I had often suspected this change before, from undoubted spheres having been seen among undoubted ellipsoids. I got fresh pollen and the phenomenon was often repeated, so that all doubt vanished. The pollen of *Oxalis acetosella* afforded another good example of this change from sphere to ellipsoid, and in this case the ellipsoids continued the change till many became distinctly rectangular, again demonstrating that form is regulated by internal tension. The brown prickly spheres of the pollen of a Cactus, *Epiphyllum truncatum*, *violaceum*, on being re-examined a second day had all changed from spheres to polygons, mostly seven or eight-sided. Doubtless, with these examples in mind, many other cases could be found. The conclusion seems inevitable that the normal primal shape of pollen is spherical, and that not only discs and ovals are modified spheres but also cylinders and rectangles as well as polygons.

Some that seem spheres under a low power are seen under a high power to be many-sided polygons, as *Chenopodium Bonus-Henricus*, and *Phlox Drummondii*. I conclude all the varied shapes are modifications or sections of spheres, viz., the ellipses, discs, squares, rhomboids, and polygons, modifications; the cones and tetrahedrons, sections; whilst the dumb-bells, trefoils, quatre-foils, etc., are aggregations.

It must be noticed how certain shapes predominate in certain orders, for example, spheres in *Campanulaceæ* and *Cactaceæ*; discs in *Mimosæ*; ellipsoids in *Liliaceæ*; polygons in *Caryophyllaceæ*; triangles in *Onagraceæ*; rectangles in *Leguminosæ*:

cylinders in *Polygalacæ*; dumb-bells in *Umbelliferæ*; and triangles in *Juncacæ* and in *Gramineæ*.

Good spheres may be obtained from Abutilon and Hollyhock; ellipsoids from Winter-Aconite, Thrift, Pennyroyal, and White Lily; tetrahedrons from the tall Wood-rush; polygons from Chickweed, Bladder-campion, Nipple-wort, and Garden-pink; cylinders and rectangles from Milkwort, Heliotrope, *Fuschia fulgens*, and *Polygala purpurea*; squares from *Diplademia crassinoda* and *Cestrum aurantiacum*; discoids from *Cuphea platycentra* and *Acacia odoratissima*, and dumb-bells from *Iberis* and Parsley.

A few are distinctly peculiar in shape, thus the Mimulas are curiously spiral, *Rubus cæsius* is prettily quatrefoil, as is also *Corydalis lutea*, whilst *Acacia lophantha* is tortoise-like. Now and then individual grains of peculiar form are met with as in the Partridge Aloe (*Aloe variegata*, Pl. V., No. 7).

SIZE OF POLLEN GRAINS. The pollen grains examined varied in diameter from one hundredth ($\frac{1}{100}$) to one twelve-thousandth ($\frac{1}{12000}$) of an inch. In my drawings a side of a square is twelve millimetres, which equals $\cdot468$ of an inch, and taking my low power to be 59.3 diameters, the actual side of the square is $\cdot00789$ of an inch.

The accompanying selection shows pollen variation in size graphically,* as do the following figures mathematically. These dimensions are approximate:—Vegetable Marrow, $\cdot01183$ or about 100 to an inch; Hollyhock and most Lilies, $\cdot00855$ or about 120 per inch; Mallow, $\cdot00657$, about 160 per inch; Convolvulus, Scabious, Willowherb, and *Plumbago Capensis*, $\cdot00526$, about 200 per inch; Abutilon, $\cdot00394$, about 260 per inch; Coltsfoot, $\cdot00197$, about 510 per inch; Daisy, $\cdot000657$, from 1500 to 1600 per inch; *Primula farinosa*, $\cdot000329$, about 3000 per inch; and the smallest of all, *Myosotis* (Forget-me-Not), $\cdot000082$, or from ten to twelve thousand per inch.

All pollen grains have a certain individual variation in size; but for each kind this limit is constant, as it is, for example, among ourselves or any other living thing. It has a wider range, however, in some cases than usual, as in Mahonia, Crocus, White Campion, Sunflower, Passion-flower, and Salad Burnet.

* See Pl. V., Nos. 53-63.

There is an apparent variation in size which results, in certain shapes, from the aspect in which the grain is viewed. Ellipsoids, discoids, parallelopipedons, and cylinders show this strongly, and polygonal figures in still greater variety, though to a less degree. Examples of such are afforded by Lily, Pear, and Groundsel; Heath, Acacia, and Cuphea; Heliotrope and Balsam; Sedge and Plantain; Elm and Stellarias.

COLOUR OF POLLEN. For play of prismatic and complementary colours, most carefully prepared experiments with costly apparatus fall short of what nature has here provided, ready to hand, for the student of the decomposition and polarization of light. The colours presented arise from two causes, first and commonest, from the presence of colouring matter in the grains, and second from either the physical condition of the Extine or from the varying refractive powers of the several constituent parts of the pollen. The colour arising from the first cause is permanent, that from the second varies with every change of focus. We will therefore take them in this order.

First, the constant colour due to the presence of pigment. All may be roughly divided into ten groups, of which nine belong to the first class, and the tenth to the second. This is their proportion:—Colourless and more or less transparent, 12·4 per cent.; white, 7·2; yellow, 47·0; orange, 10·6; brown, 5·4; red, 3·2; pink to purple, 4·0; blue, 5·2; green, 2·8; and various colours, complementary or prismatic, 2·2 per cent.

The richness, translucency, purity, and brilliance of the colours baffles description. Some of the first group are purer than diamonds, some yellows excel the topaz, reds the ruby, purples the amethyst, greens the emerald, blues the sapphire; they are the jewels of the vegetable world.

The yellow and orange largely predominate, claiming about sixty out of every hundred, which, coupled with the presence of greens, seems to indicate that chlorophyll is responsible for the colour; and seeing that most of the remainder are browns and reds, we can pretty surely conclude that iron plays a large part in colouring pollen grains. The yellows and oranges range from the palest conceivable colour to the deepest tints. In

like manner the pinks and purples range over all those charming colours yielded by modern anniline dyes, lavender, lilac, heliotrope, claret, majenta, and crimson. These form a glorious group.

Most, if not all the whites; several blues, and some few from the other colour groups, are opaque, but by far the larger number of those coloured are transparent. Hence, sometimes reflected light must be used as well as transmitted light; indeed, both should be always used, as the first best reveals external characters, and the latter internal structure and composition as well as colour.

Second, those that owe their colour to some physical condition. Most of this class belong truly to the colourless group, others to the pale blues, and a few to some of the other groups. The conditions are, first, the presence of fine striæ on the Extine, which act as a grating and resolve the white light into its constituent coloured rays, yielding therefore exquisite prismatic colours, as in *Lycopersicum*, where the Extine is very finely and symmetrically scratched on each facet; second, varying thickenings of the Extine by very thin successive laminae, and so refraction does what reflection did by the striæ, viz., decompose the white light, as in *Alopecurus agrestis*, where the flattened sides covered by successive parallel layers yield a beautiful play of complementary colours; third, by varying densities in the parts of the pollen which causes the grains to present two colours, again generally complementary, as in *Anthyllis vulneraria*, where the two large eyes of the pearly white oblongs are lavender, whilst the edges of the muff are pale green. *Epilobium angustifolium* shows pale green ground with pink hairs; *Linaria cymbalaria*, pearly white ground with delicate mauve margin; Princes-Feather (*Amaranthus*) shows three discs with large circular craters of a yellowish-brown on a pale green field. Others, though more distinctly modified by the presence of colouring matter and by degrees of transparency, present most charming pictures, as *Armeria vulgaris*, cells yellow, teeth red; *Cypripedium insigne*, yellow ground crossed longitudinally by pale brown bands; *Calla Ethiopica*, pearly white with brown nucleus; *Narcissus poeticus*, dark nucleus on bright yellow field.

The opaque pollen of *Lonicera periclymenum* is unique, for its grains are coloured variously white, yellow, brown, and red, and sometimes even two colours are seen on one grain. The pollinia of *Oncidium variegatum* are beautifully coloured objects.

Good types of the various colours are:—YELLOW, *Tussilago farfara*, *Primula auricula*, *Stellaria nemorum*, *Syringa vulgaris*, and *Polygala vulgaris*; COLOURLESS, *Fuschia triphylla* and *fulgens*, *Lathyrus alphara* and *Heliotrope Peruvianum*; ORANGE, *Galanthus nivalis*, *Crocus aureus*, *Cucurbita ovifera*, *Passiflora cœrulea*, *Salvia pratensis* and *Abutilon striatum*; WHITE, *Malva sylvestris*, *Dianthus caryophyllum*, *Pilocereus senilis*, *Oxalis acetosella*, and *Eucharis grandiflora*; BROWN, *Lathyrus latifolius*, *Pisum sativum*, *Aesculus hippocastanum*, *Mignonette*, and *Polygala purpurea*; BLUE, *Scilla Siberica*, *Agrophis nutans*, and *Symphytum officinale*; PINK, *Knautia arvensis*, *Penstemon*, *Epacris* and *Triticum vulgare*; PURPLE, *Onopordum acanthium*, *Centaurea cyanus*, and *Gladiolus cardinalis*; RED, *Saxifraga umbrosa*, *Dahlia superflua*, *Geraniums*, *Pelargoniums*, and *Lilies*; GREEN, *Epilobium angustifolium*, *Oenothera biennis*, *Draba verna*, and *Papaver argemone*.

MARKINGS OF POLLEN GRAINS. To beauty of form and colour is added beauty of sculpture and tracery—tracery often so intricate and sculpture with such gradations of relief that words fail, and even the pencil can do no more than give a general idea. This ornamentation seems quite distinct from the hairs and teeth, prickles and suckers, pollentube-pores and such like, already referred to; and from its liberal bestowal and richness of design seems like a luxury added over and above the claims of utility, to satisfy something beyond the wants of the plant, perhaps even to answer no subjective purpose at all, but an objective; to awaken, it may be, in us thoughts that may lead us from creature to Creator, and to recognise in this, so to speak, out of the way corner of nature the broad general truths:—that nothing lives wholly for self, and that after all and beyond all selfish or class purposes lies the great final purpose of all being, the “Glory of God.”

The richest diaperings of monkish manuscript or of Moorish art; the finest of geometrical tracery; the most skilful use of

boss, crotchet, bead, curve, scroll, and zigzag here find worthy rivals.

Rarely is the outline of the pollen perfectly smooth or the surface uniform, but facets are presented and outlines are broken, the boundary line flowing around in small or large waves, in crenations simple or complex, in serrations deep or shallow, wide or narrow. The surface is usually finely or coarsely dotted either by pores or pits below, or by granules or bosses above the general level; or it is ridged or furrowed generally longitudinally, rarely transversely; or it is covered with irregular sculpturings or more often with perfectly geometrical groups, breaking up the surface into such charming facets as are seen in *Luzula sylvatica* and the Stitchworts; or into circular or polygonal pits with walls bounding them and all generously carved or beaded, as in *Armeria vulgaris* and in the Lilies.

All the variations are produced by outward or inward thickenings of the Extine, and are best revealed respectively by the use of reflected and transmitted light. Thus *Begonia* presents a strong contrast of black and white under transmitted light, whilst *Cypripedium insigne* reveals the thickenings by change of tint, the yellow thin areas deepening to brown in the thick bands. The facets are sometimes revealed by the play of light showing variable bright spots under fine adjustment movements, as in *Primula farinosa*.

Both the thickness of the double cell wall and the fact that the colouring matter is sometimes confined to the cell contents may be revealed by the use of polarized light. Thus *Fritillaria* under such light shows the Extine and Intine as a transparent skin bounding each yellow grain. A similar result is yielded by *Sinapsis arvensis*.

Outward thickenings produce ridges, bands, reticulations, successive layers, bosses, and nipples, besides teeth and prickles short or long, single or in groups. These latter give endless variety and great beauty to the sculpturings proper. The commonest marking is a median cleft, which gives to the pollen the appearance of minature anther-heads or grains of wheat. The cleft is sometimes occupied by a line of cells as in *Horsechestnut*

and in *Saxifraga granulata*. By-the-bye how curiously persistent is the dual character throughout nature! Only about fifteen smooth ovals and three prickly out of my 194 were without this cleft clearly marked, whilst only eight out of the 91 spheres and discs exhibited it. Seven kinds of pollen, besides exhibiting this median cleft, have another at right angles, which imparts a cruciform character to the grains, but as these are all squares or rectangles they are probably compound, as *Anthyllis vulneraria*. Another group of cruciform grains is well represented by *Epilobium angustifolium*.

The commonest decorations are, first, longitudinal ridges and striæ, strings of beads or pores, broad bars and grooves, and in a few still broader bands and furrows. Sometimes these markings run transversely or diagonally, but in both cases their proportion is only six to 34; second, the whole surface is covered with small pits or granules, or with broad pits parted by ramparts which are often overflowed by the granular markings, showing that the hollows are thinings, not orifices. Amongst the first may be noticed the longitudinal wavy striæ of *Pentstemon*, the concentric wavy lines of *Fragaria vesca*, the slashes of *Galium cruciatum*, the clear transverse striæ of *Rhinanthus Crista-galli*, the transverse concentric bands of *Crocus aureus*, the fine annular striæ of *Saxifraga umbrosa*, and the still more beautiful annular markings of *Epilobium angustifolium*. The barred and banded groups find good representatives in *Persicaria bistorta*, *Polygala vulgaris*, *Symphytum officinale*, and the Asperulas, whilst the tesserae-like jacket of *Lysimachia nemorum*, and the prickly ridges of *Aster alpinus* command attention, as do still more urgently the lovely grains of *Salvia pratensis* and *Fuschia fulgens*.

From the pitted group may be quoted *Trifolium pratense* and *Impatiens*, as exhibiting large pores; *Pelargonium*, large circular pits with dots all over, giving a tessellated character; *Fleur-de-lis*, large irregular pits; *Hemerocallis flava*, *Agapanthus umbellatus* and *Amaryllis Sarnensis*, fine polygonal pits, the last showing bright centres with dark ramparts. *Lilium martagon* shows circular walled pits like the craters on the moon, but perhaps the most beautiful are *Lilium candidum*, *L. bulbiferum*, and *Armeria*

vulgaris. The two former show crenate margins, reticulated surfaces with polygonal dotted areas and ramparts exquisitely beaded, whilst the last adds a velvet pile as fringe to each rampart, at the same time cheveux-de-fris and veil. Undoubtedly the Thrift stands queen among the pitted pollen grains.

As examples of pollen presenting exquisitely carved facets, *Urtica dioica*, *Plantago lanceolata*, *Dianthus caryophyllus* and *D. barbatus*, *Stellaria nemorum* and *S. media*, are hard to beat. All show beautifully sculptured geometrical surfaces, but the first adds a circular central boss to each facet, and the last also a delicate fringe. Facets and polygonal form are as characteristic of *Caryophyllaceæ* as are oval form and large walled pits of *Liliaceæ*.

As regards the bearing of this study on classification, I will only say that, so far as the evidence of pollen alone is concerned, it is not easy to see why *Polianthus tuberosa* is grouped with the *Liliaceæ*, *Tropæolum Canariensis* with the *Geraniaceæ*, *Clematis tubulosa* with the *Ranunculaceæ*, etc., but on this matter more may be said another day.

EXPLANATION OF PLATE IV.

POLLEN-GRAINS.

No.

1. *Ilex Aquifolium*—trefoil grain.
2. *Geranium pusillum*—notched grain.
3. *Euphorbia splendens*—trefoil grain.
4. *Bryonia dioica*—trefoil grains, numerous.
5. *Oncidium variegatum*—two pollinia.
6. *Orchis mascula*—pollinia.
7. *Habenaria bifolia*—pollinia.
8. *Orchis maculata*—pollinia.
9. *Dendrobium nobile*—pollinia.
10. *Melampyrum pratense*—scatterers.
11. *Rubus cæsius*.
12. *Potentilla anserina*—grains, two sizes.

No.

13. *Dielytra* (*Dicentra*) *spectabilis*—notched grain.
14. *Plumbago capensis*—median cleft.
15. *Anthyllis vulneraria*—complementary colours.
16. *Allium ursinum*—very glossy.
17. *Viola odorata*—longitudinal striæ, glossy.
18. *Cypripedium insigne*—banded grains in gelatinous mass.
19. *Kalmia latifolia*—pollen tube.
20. *Echeveria glauca* or *secunda*—pollen tube.
21. *Euphorbia Jacquinæflora*—pollen tubes growing.
22. *Onopordon Acanthium*—amethyst ovals.
23. *Sedum occidentale*—a few trefoils.
24. *Lonicera Periclymenum*—opaque, bicoloured grains.
25. *Primula obconica*.
26. *Pentstemon digitalis*—longitudinal wavy striæ.
27. *Aster alpinus*—bands and prickles.
28. *Sarothamnus scoparius*, original spheres, later ovoids.
29. *Chenopodium Bonus-Henricus*—groups or many-faced.
30. *Asperula odorata*—bands.
31. *Equisetum arvense*—brown, hygroscopic spore.
32. *Abutilon venosum*—vary in size considerably.
33. *Fuchsia fulgens*—interlacing fibres.
34. *Dianthus Caryophyllus*—facets beautiful.
35. *Acacia ordoratissima*—discs.
36. *Mimulus luteus*—spiral grains.
37. *Salvia pratensis*.
38. *Epilobium augustifolium*—blue-green grains, many fine fibres.
39. *Polygala vulgaris*.
40. *Stellaria Holostea*.
41. *Heliotropium Peruvianum*.
42. *Polygala (purpurea ?)*.
43. *Cucumis sativus*.
44. *Stellaria media*.
45. *Lamium purpureum*.
46. *Nicotiana affinis*—cling in masses.
47. *Rumex obtusifolius*.

- No.
 48. *Serratula tinctoria*.
 49. *Gouslinea gauseria*.
 50. *Passiflora carulea*.
 51. *Pelargonium peltatum* (Ivy-leaved).
 52. *Bunium flexuosum*.
 53. *Lycopersicum* — (Xmas Cherry-Tomato).
 54. *Polygonum Convolvulus*.
 55. *Olea Europea*.

EXPLANATION OF PLATE V.

POLLEN-GRAINS.

- No.
 1. *Hieracium Pilosella*—ridges and prickles.
 2. *Dipladenia crassinoda*—spiral character.
 3. " " "
 4. *Cuphea platycentra*—discs, intine projections.
 5. " " " "
 6. *Luzula sylvatica*?—tetrahedrons.
 7. *Aloe variegata*?—leaves variegated.
 8. *Symphytum officinale*—blue grains.
 9. *Vaccinium Myrtillus*.
 10. *Spinacia oleracea*.
 11. *Carduus nutans*.
 12. *Armeria vulgaris*—single cell, floor in focus; grain-walls
 in focus.
 13. *Dahlia superflua*.
 14. *Imentophyllum miniatum*.
 15. *Eucharis grandiflora*—shows cells on surface.
 16. *Hemerocallis flava*—shows pitted surface.
 17. *Iris, Fleur-de-lis*—pitted surface.
 18. *Plantago lanceolata*—gem-like facets.
 19. *Stellaria nemorum*—delicate fringe.
 20. *Agapanthus umbellatus*—celled surface.
 21. *Epiphyllum truncatum, violaceum*—pitted surface.
 22. *Kniphofia (Tritoma) aloides*? (Flame Flower).
 23. *Asparagus plumosa*.

No.

24. *Lilium candidum*.
25. *Lilium bulbiferum*.
26. *Lilium rubrum*?
27. *Silene inflata*.
28. *Lilium martagon*.
29. *Convallaria majalis*.
30. *Amaryllis Sarnensis*.
31. *Arum maculatum* (Spotted-leaved).
32. *Dielytra* (*Dicentra*) *spectabilis*—grains adherent.
33. *Linaria Cymbalaria*.
34. *Crocus aureus*.
35. *Wistaria Chinensis*.
36. *Corydalis lutea*.
37. *Gladiolus cardinalis*.
38. *Scilla Sibirica*—deep blue.
39. *Vinca minor*.
40. *Oxalis acetosella*—adherent pollen.
41. *Petasites vulgaris*.
42. *Stellaria Holostea*.
43. *Stellaria uliginosa*.
44. *Pilocereus senilis*.
45. *Eranthis hyemalis*.
46. *Viola grandiflora*.
47. *Euphorbia splendens*.
48. *Impatiens* ——— Balsam.
49. *Polygonum* (*Persicaria*) *Bistorta*.
50. *Lapsana communis*.
51. *Triticum vulgare*.
52. *Polygonum aviculare*.
53. *Centaurea Cyanus*.
54. *Convolvulus Sepium*—the garden variety.
55. *Myosotis palustris*.
56. *Primula farinosa*.
57. *Bellis perennis*.
58. *Tussilago Farfara*.
59. *Abutilon insigne*.
60. *Scabiosa* (*Knautia*) *arvensis*.

No.

61. *Malva sylvestris*.
62. *Althea rosea*.
63. *Cucurbita ovifera*.
64. *Dielytra* (*Dicentra*) *spectabilis*—mother-cells.
65. *Fuchsia triphylla*—hairs.
66. *Lavandula vera*—fibres.
67. *Celosia cristata*—broken fibres.
68. *Oenothera biennis*—fine hairs.
69. *Epilobium*—(dwarf garden).
70. *Epilobium parviflorum*.
71. *Hedychium coronarium*.
72. *Iberis*—(Candytuft).
73. *Vaccinium Myrtillus*.
74. *Cestrum aurantiacum*.
75. *Anthyllis vulneraria*.
76. *Epipactis latifolia*.
77. *Spinacia oleracea*—two-sized grains.

The following gentlemen were elected members of the Club during the year 1894-95 :—

- | | | |
|-----------------------------|-------|--------------------------------|
| ANNE, MAJOR ERNEST | ..... | Victoria Square, Newcastle. |
| COMYNS, FRANK, M.A. | ..... | Grammar School, Durham. |
| DEVY, THOS. V., L.R.C.P. | ..... | Wolsingham. |
| ELLIS, REV. P. | ..... | The Vicarage, Kirkwhelpington. |
| FOWKES, WM. H. | ..... | Farningham House, Whitley. |
| ROBINSON, REV. F.G.J., M.A. | ..... | The Vicarage, Castle Eden. |
-

The following places were fixed for Field Meetings for 1895-96 :—

- | | | |
|--------------------|-------|---------------------------------------|
| MAY 23RD | ..... | Wansbeck Valley. |
| JUNE 18TH | ..... | Gilsland and Bewcastle. |
| JULY 10TH AND 11TH | ..... | Appleby. |
| AUGUST | ..... | Dredging Excursion off the Coast. |
| SEPTEMBER 14TH | ..... | Stanhope, Weardale. |
| OCTOBER 19TH | ..... | Seaton Delaval and St. Mary's Island. |

The following gentlemen were elected as Officers of the Club for 1895-96 :—

PRESIDENT.

Rev. Arthur Watts, Witton Gilbert.

VICE-PRESIDENTS.

T. W. Backhouse.

Rev. W. Johnson.

John Glover.

HON. TREASURER.

R. Y. Green.

HON. SECRETARIES.

Richard Howse

Thomas Thompson.

Faraday Spence.

COMMITTEE.

Prof. G. S. Brady.

Rev. J. M. Hick.

Wm. E. Branford.

G. H. Philipson, M.D.

E. J. J. Browell

John Philipson.

Joseph Cobb.

W. M. Pybus.

D. Embleton, M.D.

J. F. Spence.

George Harkus.

R. M. Tate.

ADDITIONS.

J. S. Forster.

Arthur T'ranah.

ABSTRACT OF TREASURER'S ACCOUNT OF TYNESIDE NATURALISTS' FIELD CLUB.

		Dr.		Cr.	
			£ s. d.		£ s. d.
1894.				1894.	
Jan.	To Balance in hand		11 18 6	Jan.	By J. Bell & Co.
	" Subscriptions		61 6 0		" "Journal.....
	" Transactions Sold		1 16 0		" Secretaries' Expenses.....
					" Postage and Sundries
				Dec. 31.	" Balance
			<u>£75 0 6</u>		
					<u><u>£75 0 6</u></u>

April 20th, 1895.—Payments examined with Vouchers and found correct,
ARTHUR TRANEH.

ARTHUR TRANAH, AUDITOR.

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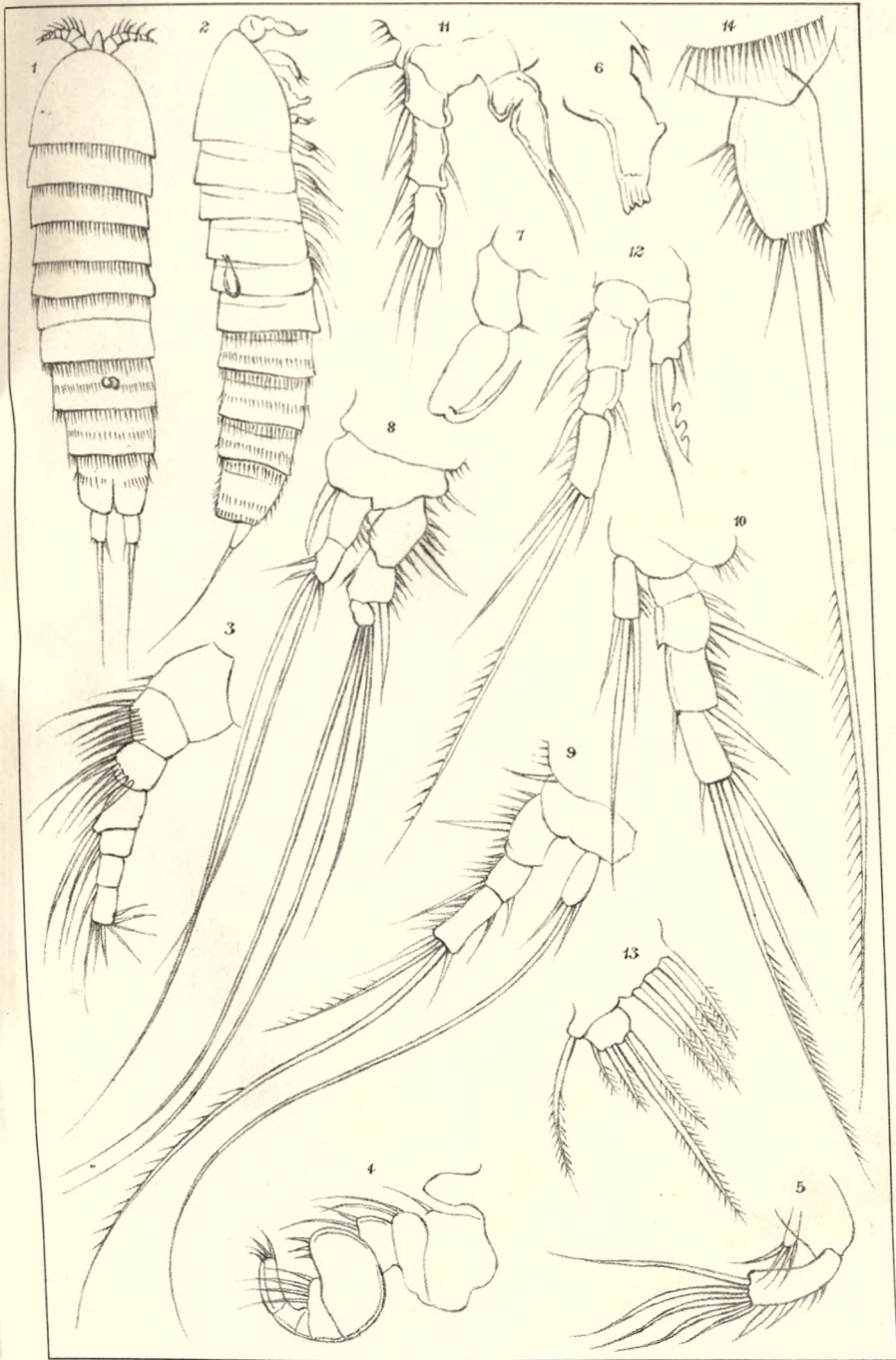
1891

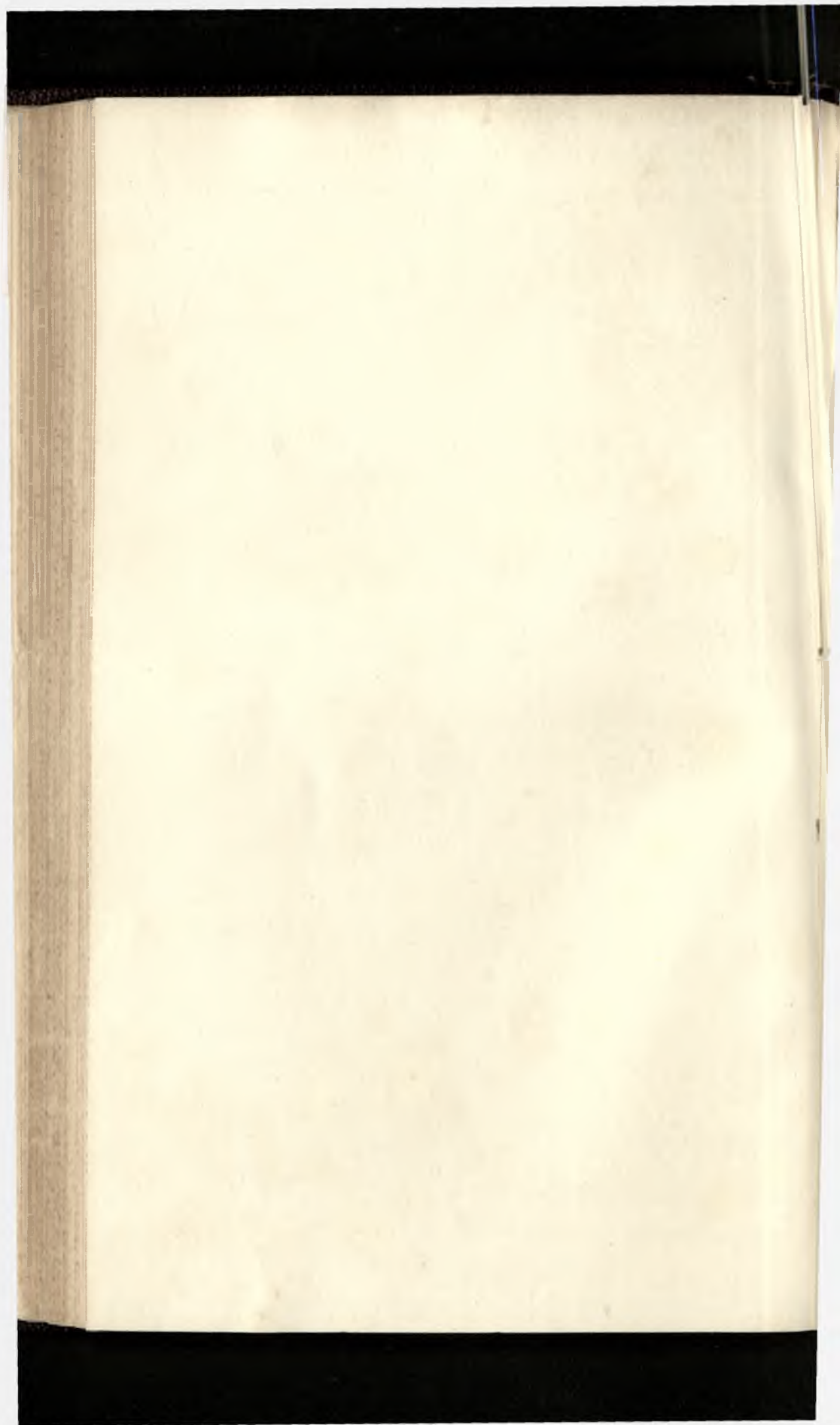
1891

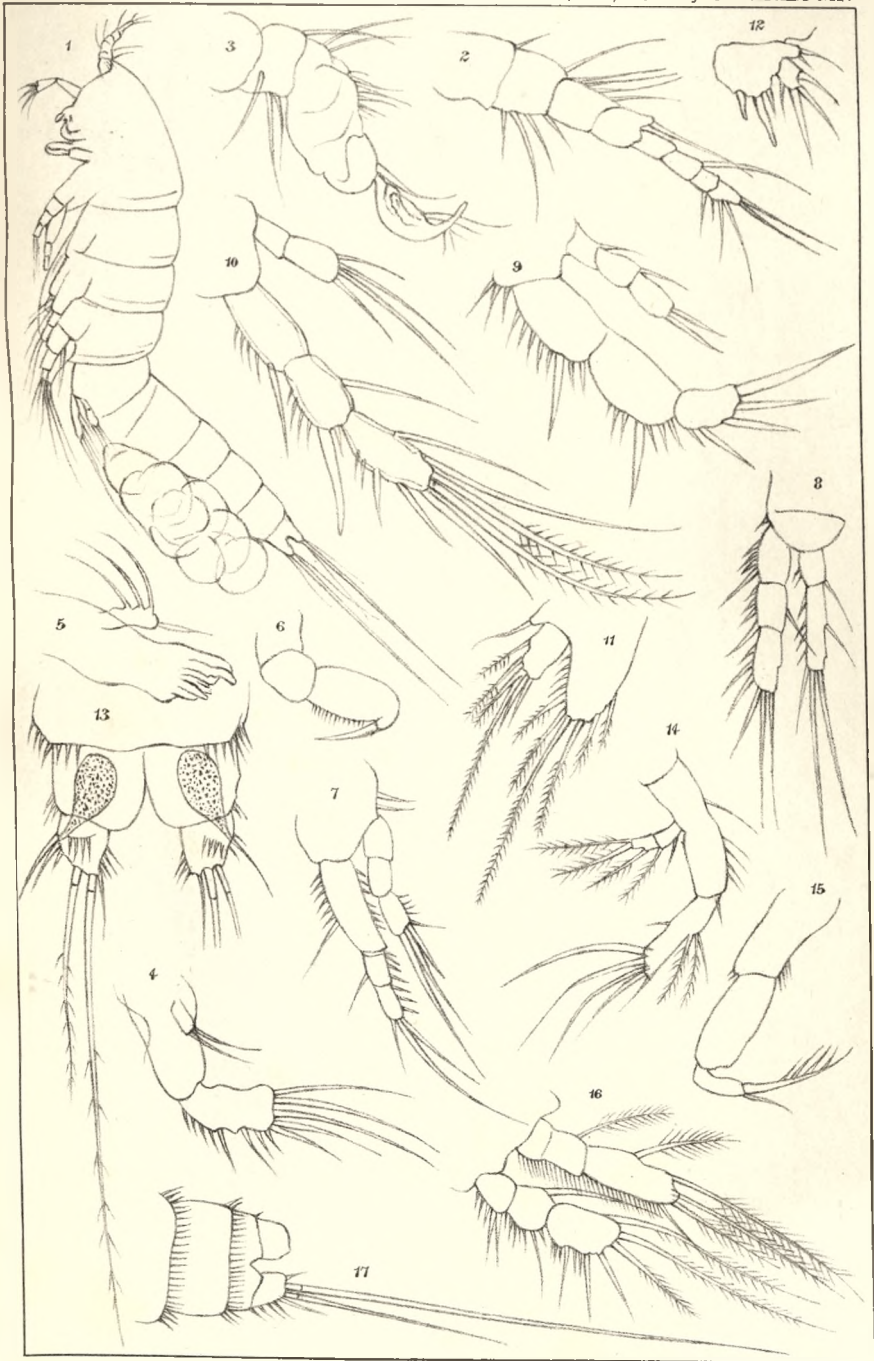
1891

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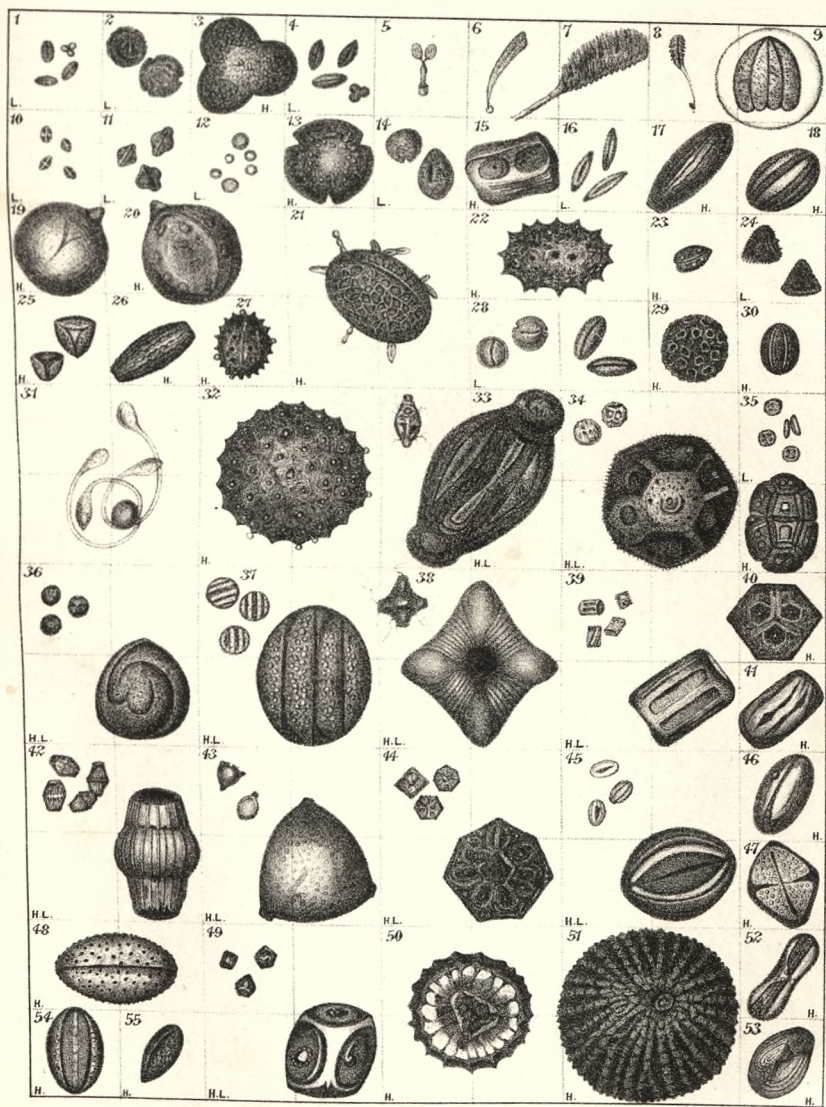
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ABSTRACT OF TREASURER'S ACCOUNT OF TYNESIDE NATURALISTS' FIELD CLUB.

Dr.		£	s.	d.
1894.				
Jan.	To Balance in hand	11	18	6
	„ Subscriptions	61	6	0
	„ Transactions Sold	1	16	0

£75 0 6

Cr.		£	s.	d.
1894.				
Jan.	By J. Bell & Co.	50	0	0
	„ „Journal”	13	10	4
	„ Secretaries' Expenses.....	5	16	0
	„ Postage and Sundries	0	5	6
Dec. 31.	„ Balance	5	8	8

£75 0 6

TREASURER'S REPORT.

April 20th, 1895.—Payments examined with Vouchers and found correct,

ARTHUR TRANAH, AUDITOR.

NATURAL HISTORY SOCIETY
OF
NORTHUMBERLAND, DURHAM, AND NEWCASTLE-
UPON-TYNE.

ANNUAL MEETING, 26TH SEPT., 1895.

REPORT FOR 1894-95.

In presenting their Report for the past year, the Committee have to mention that the general attendance of the public shews a slight diminution compared with former years—but it should be mentioned that the number of visitors to the Museum at holiday times was much in excess, as shewn by the receipts of previous years, and the attendance of excursionists from distant parts of the counties has been as usual very satisfactory. Probably the slight decrease in the receipts for the year has arisen from the greater number of young people than of adults who have visited the Museum during the year.

It will be seen from the Balance Sheet that some unusually heavy expenses have devolved upon the Society in the past year. To meet these the Committee have been compelled to transfer the John Taylor legacy of £180 to the revenue account, by which means the incurring of a small deficit has been avoided.

The desirability of increasing the present membership, which has suffered severe reduction during the last few years by the decease of many of the older, long-standing members, has been fully and carefully considered by the Committee, who after much consideration, recommend that an appeal be made by issuing circulars to all the principal residents in Northumberland, Durham, and Newcastle-on-Tyne, in the hope of enlisting

a wider interest in the welfare of the Society and assistance in carrying out the objects the Society have in view, namely, the completing the arrangement of the Museum by filling up the gaps in the present collection, and thus making them more useful to students and the general public. The Committee sincerely hope that their efforts in this direction may meet with the hearty co-operation of all the present members in these counties.

It may be mentioned here that the Education Department have formally recognized the value of Museums as Educational Institutions, and its regulations now permit scholars in elementary schools to visit Museums during school hours as part of their school work. It is to be hoped that teachers in elementary schools will take advantage of this regulation to bring their pupils more frequently to the Museum, and if the demand arises and the funds and space in the Museum allow, a series of more elementary educational cases might be arranged for the benefit of such visitors.

In former Reports the Committee have mentioned that they were engaged, in accordance with a proposal by the Rev. Canon Tristram, in forming a fund for the granting of one or more prizes for essays or other kinds of original research in Natural History, such fund to be styled the Hancock Prize fund, and to be awarded by the Society.—The Committee consider that a minimum capital of £200 would be required for this purpose, and the appeal which has already been made to the members and public has resulted in promised subscriptions to the amount of £168. The regulations for the management of this fund and the method of awarding it, are now under the consideration of a sub-committee, and further donations to complete the sum still required will be most gratefully received.

In the beginning of the present year it was decided to invite the members of the Museums Association to hold their Annual Meeting in Newcastle, in the month of July. This Association was organized a few years ago with the object of promoting friendly intercourse between the Curators and the Managers of Museums in distant parts of the country—to discuss topics and

papers relating to the management and arrangement of Museums, and to promote a system of exchanges of duplicate specimens, and generally to further the development of local and provincial Museums; such work being considered in accordance with and carrying out some of the objects aimed at by this Society, a cordial invitation was given to the members to visit Newcastle. The meeting was fixed to be held in the last week in July, and our distinguished Vice-President, the Rev. Canon Norman, was selected as President of the Newcastle Meeting. The members met on the 23rd July, in the Durham College of Science, in which rooms had been obligingly granted by the Council of the College to the Association, and the general meetings were held during four days in the Physical Lecture Theatre of the College. At the first meeting an excellent address was given by the President on the origin of the Natural History Society—the work done by its members and the members of the Tyne-side Naturalists' Field Club—and many details regarding the establishment of this Society and the growth of the Museum and its important collections. Afternoon visits, after the morning reading and discussion of papers, were made to Durham to visit the Cathedral and Rev. Canon Tristram's Collection, and to Burnmoor Rectory to see the President's extensive collections of Northern Invertebrata. A *Conversazione* and Reception of the Associates was held in the Museum on the Wednesday evening, and a visit to the Sunderland Museum, and an invitation to dinner by the Mayor of Sunderland, took place on the Friday evening. Numerous papers on important subjects connected with the organization and arrangement of Museums were read and discussed at the morning sittings, and notwithstanding the very unsettled and stormy state of the weather, which prevented the carrying out of contemplated excursions to the Durham coast, the Newcastle Meeting was considered to be, in the main object of such gatherings, very successful.

Two Evening Meetings were held in January and February in connection with the Tyneside Naturalists' Field Club, in the Committee Room. At the first meeting the Rev. Arthur Watts read an elaborate essay on the "Life History of Coal," which

was followed by a long discussion. The weather at the time was exceedingly stormy, so that not many members were able to be present. The second meeting was on 22nd February, when Prof. G. S. Brady read an interesting paper on "Entomostraca collected in the Solway District and at Seaton Sluice, Northumberland, during the Summer of 1894." Short notes were also read by the Curator on the Marsupial Mole, *Notoryctes typhlops*, captured in 1892, in the Northern part of South Australia, and recently presented to the Museum by Mr. Frank Sutherland. A note was also read on the White Ants from South Africa, and some novel specimens, presented by Mrs. Gethin, were exhibited at the meeting. The long continuance of severe stormy weather in the early months of the year operated much against the attendance at the Evening Meetings.

Through the generous donation of £1,500 by Lord Armstrong, the Committee have been enabled during the past year to complete the furnishing of the Bird-room Gallery, and the furnishing of the Upper and Lower West Corridors with suitable floor-cases and an extensive wall-cabinet, in which the large collection of Minerals and Rock specimens have been recently arranged. The removal of the Minerals from the floor-cabinets of the Geological Room has enabled the Curator to arrange the large collection of Fossil Fishes, bequeathed by the late Hon. Secretary, Mr. Wm. Dinning, in the floor-cases, and to display many specimens that were formerly kept in drawers. Also by the removal of the Rock specimens from the wall-cases of the Geological-room Gallery, room was made for the arrangements of the Collections of Recent, Tertiary, and Secondary Fossils in this gallery. The whole of the Wall-cabinets on the ground floor being now devoted to the Palæozoic Fossils, and chiefly to the extensive local collections of fossils from the Magnesian-limestone, Marl-slate, Coal-measure, and Carboniferous-limestone of the North of England, which are now more fully and adequately displayed.

With much regret we have to deplore the loss of several of our older, influential, and working members, especially Mr. Charles Adamson, at the mature age of 74. Mr. Adamson was at an early period connected with the Museum and with its

earliest working members through his father John Adamson, Esqr. (Secretary for many years of the Literary and Philosophical Society), who was not only an original member of this Society, and on its Committee from the first, but was also one of the few naturalists who, as members of the Lit. and Phil. Society, first organized a Museum in Newcastle in connection with that Society. He was an enthusiastic botanist and conchologist, as shown by the donation of plants and shells to the Museum in its infancy, and the portfolios of drawings of Shells presented by his son, the Rev. Edw. Hussey Adamson. In his early days, Mr. Charles Adamson devoted himself chiefly to researches in Ornithology, and became an accomplished and accurate observer, especially of the wading birds and the seasonal changes of plumage of this interesting group—his interesting notes "Scraps about Birds," being chiefly devoted to observations on the Waders and other Water-birds made through a long series of years at Prestwick Carr and on the coasts of Northumberland. In later years his attention was particularly drawn to the study of the Lepidoptera, by the large and rare collections of Butterflies sent by his eldest son, Lt.-Col. C. H. E. Adamson, from Burmah. Mr. Adamson served on the Committee for a long series of years, and afterwards was elected a Vice-President. He was an enthusiastic naturalist of the old-school type, which played so important a part in extending the pursuits of Natural History during the first half of the present century.

Mr. Thomas Bell, whose loss to the Society we also deplore, formerly took an active part as a member of the Committee in the affairs of the Society, until his removal from this district. He was an enthusiastic collector of the Lepidoptera, which pursuit he followed as a recreation and relaxation from business up to the last year. On removing from this neighbourhood he was elected a Vice-President of the Society.

DONATIONS.

Some rather interesting donations have been made to the Museum collections. The Mammalian series has been enriched by the gift of a fine specimen of the rare Marsupial Mole,

Notoryctes typhlops, by Master Frank Sutherland. It is all the more interesting to our collections as it was caught on the sand-hills at Idracoura Station, near the Finke River, in the Northern Territory of South Australia, by Mr. Herbert J. Sutherland, and was one of the first specimens of this new Marsupial taken, and is one of the rarest discoveries made in Australia in recent years. A. H. Straker, Esq., of Stagshaw House, Corbridge, presented a fine skull of *Rhinoceros bicornis*? and two skins and skulls of *Neotragus Kirkii* from Somaliland. The proprietor of Sanger's Circus, L. G. Sanger, Esq., presented a fine young Lion, which had been killed in the circus by its companion. This Lion has been carefully preserved by Mr. John Jackson, and through the kindness of an unknown friend, per Mr. R. Y. Green, a valuable case has been presented to the Society for its exhibition. Mr. J. Ewen, St. Mary's Island, sent a very fine young Seal, *Phoca vitulina*, caught alive on the Island in August, 1894.

During a visit to the Upper Nile district last winter, Mr. R. C. Clephan fortunately obtained a very fine example of the Bichir, *Polypterus bichir*, a rare ganoid fish, peculiar to North Africa in the Rivers Nile and Gambia, which is now with the increase of traffic becoming rarer every year in the lower parts of the Nile. The great interest attaching to this fish is that it is almost the only representative in the present period of a large group of fishes that flourished and were characteristic of the Carboniferous and Devonian Systems of the early Palæozoic Rocks. Mr. Robson, of Derwenthaugh, presented a very large Grey Mullet, 26 inches in length, caught in the Salmon Nets near Dunston Battery.

About thirty birds have been presented during the year, of which most have been set up and added to the Collection in the Bird Room. Among these is a fine adult example of Sabine's Gull, *Zema Sabinii*, in summer plumage, from the Arctic regions, presented by R. N. Kerr, Esq., of Dundee. A very fine Golden Eagle, captured in Perthshire, was presented by Bryan Cookson, Esqr.; and George Crawhall, Esqr., presented a female Peregrine Falcon, caught in the South of Scotland. Mr. T.

Thompson sent us a fine example of the Red-necked Grebe from Holy Island, and Mr. John Duncan has from time to time contributed several interesting Water Birds from the Northumberland Coast.

C. J. Leyland, Esqr., of Haggerston Castle, Beal, obligingly sent a fine example of Mantell's Apteryx, *Apteryx Mantelli*, which had been living at Haggerston for some years, and which now forms part of the fine series of Struthious Birds in the gallery of the Bird Room. A detailed enumeration of all the donations of Reptiles, Insects, and other objects presented to the Museum during the past year will be found appended to this Report, as also a list of the Books and Transactions received in exchange from other learned Societies.

The following is a list of New Members elected during the year 1894-95 :—

GEORGE ALLAN	9, Osborne Villas.
JOHN BIDGOOD, B. Sc., F.G.S. ..	9, Richmond Ter., Gateshead
GEORGE ELPHICK, M.R.C.V.S. ..	1, Brandling Park.
WILLIAM FRANCIS.....	20, Collingwood Street.
Rev. HY. PALIN GURNEY, M.A., F.G.S.	Durham College of Science.
PROF. R. HOWDEN ...	College of Medicine.
GILBERT HOWSE	Cullercoats.
ALEXANDER MEEK, B.Sc., F.Z.S.	Durham College of Science.
PROF. G. R. MURRAY, M.D.....	College of Medicine.

HONORARY MEMBER.

HENRY TUKE MENNELL.....	Croydon, a former Honorary Secretary of Nat. Hist. Soc.
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ABSTRACT OF MINUTES.

ANNUAL MEETING, 9TH OCTOBER, 1895.

W. A. WATSON-ARMSTRONG, ESQ., IN THE CHAIR.

The Minutes of last Annual Meeting were read and confirmed.

The Chairman moved the adoption of the Report, which was seconded by the Rev. Principal Gurney, and carried unanimously.

The Hon. Treasurer's Financial Report was read by the Secretary, and unanimously adopted.

The List of Officers for 1895-96 proposed for election was read by the Secretary.

Major Anne moved and Mr. R. Cooke seconded that the gentlemen now proposed be elected officers of the Society for 1895-96.

Mr. E. J. J. Browell proposed and Mr. J. Philipson seconded that a cordial vote of thanks be given to the Chairman. The vote of thanks was carried with acclamation.

THE HONORARY TREASURER IN ACCOUNT

Dr.

CURRENT ACCOUNT FROM 30TH JUNE

1895.	RECEIPTS.	£	s.	d.
June 30.	To Balance of last Account	70	11	1
	„ Members' Subscriptions	274	16	9
	„ Admission Fees	154	4	0
	„ Interest on Stock :—			
	Newcastle Corporation, 3½ per cent.			
	Stock (less Income Tax)	£67	14	10
	Wear Commissioners, 4½ per cent.			
	Stock (less Income Tax)	21	15	6
	Tyne Commissioners' Consolidated			
	Fund at 4 per cent.	77	8	5
			166	18 9
	„ Deposit Receipt for £180, No. 22361,			
	transferred to Current Account ...	180	0	0
	„ Interest on ditto	2	4	5
			182	4 5
	„ Guides to Muscum sold		3	13 8

£852 8 8

WITH THE NATURAL HISTORY SOCIETY.

1894, TO 30TH JUNE, 1895.

Cr.

1895.	PAYMENTS.	£	s.	d.	£	s.	d.
June 30.	By Salaries and Wages:—						
	Richard Howse	200	0	0			
	Joseph Wright	100	0	0			
	Wm. Vout	67	12	0			
	Albert Spencer	54	12	0			
	Mrs. Atkinson	26	0	0			
					448	4	0
	„ Incidental Expenses:—						
	Coal	5	19	0			
	Coke	20	15	0			
	Gas	6	11	9			
	Water	5	15	2			
	Advertisements	1	1	0			
	Taxes	6	17	2			
	Insurances	23	3	0			
	Electric Lighting	10	8	5			
					80	10	6
	„ Tradesmen's Accounts:—						
	Dinning & Cooke	8	14	6			
	Gurney & Jackson	1	10	0			
	John Bell	2	13	6			
	Beck & Sons	6	8	4			
	Walker & Son	1	10	0			
	Ferguson	1	9	10			
	G. G. Laidler	50	3	11			
	J. Jackson	22	15	0			
					95	5	1
	„ Sundries:—						
	Paid to Hon. Sec. T.N.F. Club,						
	Moiety of Publishing Act	50	0	0			
	Disbursements by J. Wright	20	12	3			
	Lichen Herbarum, Rev. W Johnson	1	6	0			
	Cheque Books	0	10	0			
					72	8	3
	„ Balance in Bank				156	0	10
					£852	8	8

THOS. THOMPSON,
HON. TREASURER.

Examined and found correct.

SAM. GRAHAM, }
E. O. REID, } AUDITORS.

THE HONORARY TREASURER IN ACCOUNT

DR. CAPITAL ACCOUNT,

1895.		£	s.	d.
June 30.	To Invested in Newcastle Corporation Irredeemable Stock at $3\frac{1}{2}$ per cent., as per last Capital Account	2000	0	0
„	Invested in River Wear Commission Funded Debt at $4\frac{1}{2}$ per cent., as per last Capital Account.....	500	0	0
„	Invested in Tyne Commissioners Consolidated Fund at 4 per cent., as per last Capital Account.....	2000	0	0
		<u>£4500</u>	<u>0</u>	<u>0</u>

FITTING ACCOUNT,

1894.		£	s.	d.
June 30.	To Balance in Messrs. Lambton & Co.'s Bank, Grey Street ..	691	11	0
Dec. 31.	„ Interest on ditto	4	8	0
1895.				
June 29.	„ Interest	2	1	9

£698 0 9

WITH THE NATURAL HISTORY SOCIETY.

30TH JUNE, 1895.

Cr.

1895.	£	s.	d.
June 30. By Newcastle Corporation Irredeemable Stock at 3½ per cent, as per Certificate No. 260	2000	0	0
„ River Wear Commission Funded Debt, at 4½ per cent., No. 967	500	0	0
„ Tyne Commissioners Consolidated Fund at 4 per cent., Mortgage No. 5948	2000	0	0

 £4500 0 0

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct, 29th August, 1895.

 SAM. GRAHAM, }
 E. O. REID, } AUDITORS.

30TH JUNE, 1895.

1894.	£	s.	d.
Oct. 12. By Cash, Messrs. Robson & Sons	170	8	0
Nov. 15. „ do. Messrs. Sopwith & Co.	40	10	9
1895.			
Jan. 10. „ do. Messrs. Robson & Sons	160	0	0
Mar. 14. „ do. Messrs. Sopwith & Co.	80	14	0
„ 18. „ do. Miss Wright.....	1	7	0
June 14. „ do. Messrs. Robson & Sons	2	7	6
„ 30. „ Balance in Bank... ..	242	13	6
	£698	0	9

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct, 29th August, 1895.

 SAM. GRAHAM, }
 E. O. REID, } AUDITORS.

OFFICERS OF THE NATURAL HISTORY SOCIETY, 1895-96.

The following Gentlemen were elected Officers of the Society for 1895-96.

PATRONS.

His Grace the Duke of Northumberland.
The Right Rev. the Lord Bishop of Durham.
The Right Rev. the Lord Bishop of Newcastle.

PRESIDENT.

The Right Honourable Lord Armstrong, C.B., F.R.S.

VICE-PRESIDENTS.

The Right Honourable the Earl of Ravensworth.
The Right Honourable the Earl Percy.
Sir M. White Ridley, Bart., M.P.
Sir Lowthian Bell, Bart., F.R.S.
Sir Andrew Noble, K.C.B., F.R.S.
Sir James Joicey, M.P.
The Worshipful the Mayor of Newcastle.

D. Embleton, Esq., M.D.

R. R. Dees, Esq.

G. H. Philipson, Esq., M.D.

John Daglish, Esq.

J. W. Swan, Esq., F.R.S.

D. O. Drewett, Esq.

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E. J. J. Browell, Esq.

J. A. Woods, Esq.

Alex. S. Stevenson, Esq.

I. G. Dickinson, Esq.

W. A. Watson-Armsirong, Esq.

W. D. Cruddas, Esq., M.P.

Rev. Canon Norman, F.R.S.

Prof. G. S. Brady, M.D., F.R.S.

George E. Crawhall, Esq.

Rev. Principal H. P. Gurney, M.A.,
F.G.S.

HON. TREASURER.

Thomas Thompson, Esq.

HON. SECRETARIES.

A. H. Dickinson.

Prof. M. C. Potter.

COMMITTEE.

Mr. H. T. Archer.

Mr. Robt. C. Clephan.

Mr. Samuel Graham.

Mr. R. Y. Green.

Mr. N. H. Martin.

Prof. G. R. Murray.

Mr. W. M. Pybus.

Mr. John Pattinson.

Mr. John Philipson.

Mr. Wm. B. Reid.

Prof. Wm. Somerville.

Mr. J. F. Spence.

AUDITORS.

E. O. Reid.

Samuel Graham.

HONORARY CURATORS,

1895-96.

ZOOLOGY.

VERTEBRATA.

D. Embleton, M.D.
Alex. Meek, B.Sc.
Samuel Graham.

Geo. L. Crawhall.
Thos. Thompson.
E. O. Reid.

INVERTEBRATA.

Rev. Canon Norman.
N. H. Martin.

Prof. G. S. Brady.

BOTANY.

Rev. Henry Fox.
Rev. Wm. Johnson.
C. E. Stuart.

Prof. M. C. Potter.
J. Bidgood, B.Sc.

GEOLOGY AND MINERALOGY.

E. J. J. Browell
J. Daglish.
E. J. Garwood.
J. W. Kirkby.

Prof. G. A. Lebour.
Jno. Pattinson.
Rev. Principal Gurney.
Prof. P. P. Bedson.

CURATOR.

Richard Howse.

KEEPER OF THE MUSEUM.

Joseph Wright.

LIST OF EXCHANGES AND DONATIONS TO THE MUSEUM
AND LIBRARY
OF
THE NATURAL HISTORY SOCIETY,
FROM JULY 1ST, 1894, TO JUNE 30TH, 1895.

AMERICAN SOCIETIES.

UNITED STATES OF AMERICA.

Albany :—*New York State Library.*

Regent's Report, 45, 46 for 1891-92.

Boston :—*Society of Natural History.*

Proceedings, Vol. 26, Parts 2, 3. Nov. 1893—May, 1894.

Memoirs, Vol. 3, No. 14. 1893.

Occasional Papers, Vol. 4.

Geol. of the Boston Basin, Vol. 1, Part 2, and Maps

Boston :—*American Academy of Arts and Sciences.*

Proceedings, New Ser., 20, 21.

The Academy.

Cambridge :—*Museum of Comparative Zoology, Harvard College.*

Bulletin, Geol. Ser., Vol. 16, No. 15.

„ Vol. 25, Nos. 7, 8, 9, 10, 11, 12.

„ „ 26, No. 1, 2.

„ „ 27, No. 1.

Annual Report of the Curator. 1893-94.

Report on Exploration off the West Coast of Mexico, Central and South
America, (xii. *Holothuroidea*). *Prof. Alex. Agassiz.*

New York :—*Academy of Science and Lyceum of Nat. History.*

Vol. 6. Index.

Annals, Vol. 7, Nos. 6-12. Index.

„ „ 8, „ 4, 5. 1895.

The Academy.

Philadelphia :—*Academy of Natural Sciences.*

Proceedings, Part 3. 1893.

„ „ 1, 2, 3. 1894.

The Academy.

Philadelphia :—*American Philosophical Society.*

Proceedings, Vol. 32, No. 143. May, 1893.

„ „ 33, „ 144.

„ „ 33, „ 145.

„ „ 33, „ 146. Dec., 1894.

The Society.

Salem :—*American Association for Advancement of Science.*

Proceedings, 42nd Meeting, Madison, Wiscon., 1893.

The Association.

St. Louis:—Academy of Science.

Transactions, Vol. VI., Nos. 9-17. 1893-94. *The Academy.*

Washington:—Smithsonian Institution: Bureau of Ethnology.

10th, 11th and 12th Annual Reports, 1888-89, 1889-90, and 1890-91.

3 Bulletins, viz. :—

Paymunsky Indians of Virginia.

The Maya Year.

Wakashan Language (Bibliography).

Contributions to American Ethnology. Vol. IX.

List of Publications of Bureau of Ethnology.

Washington:—Smithsonian Institution: Contributions to Knowledge.

Reports for 1892 and 1893.

Miscellaneous Collections :—

Geographical Tables. R. S. Woodward, 1894.

Varieties of the Human Species.

Bibliography of Aceto-acetic Ester.

The Institution.

Washington:—Smithsonian Institution, U.S. National Museum.

Report of U.S. National Museum. 1892.

Proceedings, U.S.N.M., Vol. 16. 1893.

Bulletins, No. 43.

Monograph of North American Bats.

The Institution.

Washington:—United States Geological Survey.

12th Annual Report. Part 1 (Geology), 1890-91.

„ „ „ 2 (Irrigation).

13th „ „ „ 1. 1891-2, Report of Directors.

„ „ „ 2. Geology.

„ „ „ 3. Irrigation.

Mineral Resources of the U.S.A. for 1892 and 1893.

Monographs, XIX., XXI., XXII.

Bulletins, 97-117.

The Director of U.S. Geol. Survey.

Washington:—Department of Agriculture.

Bulletin, No. 8. North American Fauna (Pocket Gophers).

The U.S. Department of Agriculture.

SOUTH AMERICAN STATES.

Uruguay, Monte Video:—Museo Nacional.

Anales, Part 2. 1894.

The Director.

BRITISH SOCIETIES.

Berwick-upon-Tweed:—Berwickshire Naturalists' Club.

Vol. 14, Part 2. 1895.

The Club.

Cambridge University:—Philosophical Society.

Proceedings, Vol. VIII., Parts 3, 4.

The Society.

*Cardiff:—Naturalists' Society.*Report and Transactions, Vol. 26, Part 1, 2. 1893-5. *The Society.**Dublin:—Royal Society.*

Transactions, Vol. IV., Part 14; Vol. V., Parts 1, 2, 3, 4.

Proceedings, Vol. VII., Part 5; Vol. VIII., Parts 1, 2.

Edinburgh:—Geological Society.

Transactions, Vol. VII., Part 1. 1894.

Edinburgh:—Botanical Society.

Transactions and Proceedings, Vol. XX., Part 1. 1894.

Edinburgh:—Scottish Meteorological Society.

Journal, 3rd Ser., No. X.

*The Society.**Greenwich:—Royal Observatory.*

Magnetical and Meteorological Observations, 1891.

*The Astronomer Royal.**London:—British Museum, Cromwell Road, Kensington.*

Catalogue of Snakes, Vol. 2. 1894.

Monograph of Mycetozoa, by Arthur Lister.

*The Trustees of British Museum.**London:—Nature.*

From June 30th, 1894—June 30th, 1895.

*The Publisher.**London:—Quekett Microscopical Club.*Journal, Vol. 5, 2nd Ser., No. 35, Vol. 6, No. 36. 1894-5. *The Club.**London.*

Rhoplocera Exotica, Parts 29, 30, 31, 32. 1894-5.

*Purchased.**London:—Zoological Society.*

Proceedings, Parts 2, 3, 4. 1894.

" " 1. 1895.

Transactions, Vol. 13, Parts 9, 10.

*The Society.**Manchester:—Literary and Philosophical Society.*

Report of Council. 1893-4.

Memoirs and Proceedings, 4th Ser., Vol. 8, No. 3.

" " " " 9, " 1, 2.

*The Society.**Manchester:—Microscopical Society.*

Transactions and Annual Report for 1893.

*The Society.**Newcastle-on-Tyne:—Institute of Mining & Mechanical Engineers.*

Transactions, Vol. 43, Parts 5, 6.

" " 44, " 1, 2, 3.

Annual Report, 1893-4.

Report of the Flameless Explosive Committee, 1894. *The Institute.**Northampton:—Northamptonshire Nat. Hist. Soc. and Field Club.*

Nos. 57-60, for 1894.

The Society.

Norwich :—*Norfolk and Norwich Naturalists' Societies.*

Transactions, Vols. IV., V. 1884-94.

The Society.

Plymouth :—*Plymouth Institute.*

Report and Transactions, Vol. 11, Part 4. 1893-94.

The Institute.

Shildon, Co. Durham.

Herbarium of Lichen-Flora of North of England. Rev. W. Johnson.

Fasciculi I., II., III., IV. I and II.

Mr. Richd. Howse.

III. and IV.

Purchased.

York :—*Yorkshire Philosophical Society.*

Annual Report for 1894.

The Society.

COLONIAL SOCIETIES.

AUSTRALIA.

Adelaide, South Australia :—*Australasian Association for the Advancement of Science*

Report of 5th Meeting, Adelaide. 1893.

The Association.

Sydney, N.S.W. :—*Royal Society.*

Journal and Proceedings, Vol. XXVII. 1893.

Sydney, N.S.W. :—*Australian Museum.*

Report of Trustees for 1893.

CANADA.

Halifax, Nova Scotia :—*The N.S. Institute of Natural Science.*

Proceedings and Transactions, Vol. 1, Part 3, 2nd Ser. 1893.

The Society.

Montreal :—*Natural History Society.*

Canadian Record of Science, Vol. 5, No. 8.

The Natural History Society, Montreal.

EUROPEAN SOCIETIES.

FRANCE.

Paris :—*Museum d'Histoire Naturelle.*

Bulletin Nos. 1, 2, 3. 1895.

AUSTRIA.

Prague :—*Archiv. der Naturwissenschaft Landesdurchforschung von Böhmen.*

Band 7, No. 1.

„ 8, „ 5.

„ 9, „ 1, 2, 4.

The Society.

Vienna :—*Verhandlungen der K. K. Zool-Botan. Gesellschaft in Wien.*

Jahrgang, 1894, Band XLIV., Quartals 1, 2, 3, 4. 1894.

„ 1895, „ XLV., Heft 1, 2, 3, 4, 5.

The Society.

DENMARK.

Copenhagen :—*Videnskabelige fra Naturhistoriske Forening i Kjobenhavn.*

Meddelelser for Aarat, 1894.

The Society.

GERMANY.

Saxony, Dresden :—*Der Isis.*

Abhandlungen. July—Dec., 1893.

„ Jan.—June, 1894.

The Society

NORWAY.

Bergen :—*Bergens Museums.*

Aarsberetning, 1893.

The Director of the Museum.

Christiania :—*Videnskabs-selskab. etc.*

Forhandling, 1-21. 1893.

Oversigt for 1894. N.B. (No. 9. Norges Ascidie simplices).

SWEDEN.

Stockholm :—*Kongliga Svenska Vetenskaps-Akademiens.*

Handlingar (Memoirs), 4to, Band 25, Parts 1, 2. 1892.

Bihang (Supplement), 8vo, 19. 1-4.

The Academy.

Upsala :—*University of Upsala (Geological Institute).*

Bulletin, Vol. 1, Parts 1, 2.

„ „ 2 „ 1.

The Institute.

MISCELLANEOUS.

Tufts' College, Mass. Development of Lungs of Spiders. O. L. Simmons.

Tuft College Studies, No. 3.

The Director.

Two MS. Catalogues of Nests and Eggs, and Eggs of British Birds.

Four MS. Lists of Nests and Eggs, and Eggs of British Birds.

B.O.U. Catalogue of British Birds.

Frederic Raine, Esq.

Three original letters written to his children by Thomas Bewick, Engraver,

Newcastle-upon-Tyne, 1807, 1813, 1814? two from Chillingham and

one from the Forth, Newcastle, 4th Sept., 1807.

Presented by E. B. Ward in the name of the family of the late Robert Ward.

MAMMALS.

A Seal, *Phoca (Callocephalus) vitulina*, L., ♂ immature, caught alive at St. Mary's Island, August 1894. Mr. J. Ewen, St. Mary's Island

Skull of African Rhinoceros, *R. bicornis*, and two skins and skulls of

Neotragus Kirkii, shot by A. H. Straker, Esq., in Somali-land.

A. H. Straker, Esq., Stagshaw House.

Marsupial Mole, *Notoryctes typhlops*, Sterling, from South Australia.
(Captured with others by Mr. Herbert J. Sutherland at Idracowra Station,
on the Finke River, Northern Territory of South Australia, 1892-3).

Master Frank Sutherland, Sydenham Terrace.

Long tailed Field Vole, from Preston, North Shields. Mr. J. Duncan.

A fine example of a young Lion about four years old, killed by its companion, 14th May, in the Circus on the Leazes, Newcastle-on-Tyne.

Lord George Sanger, Esq.

BIRDS.

Three Roseate Terns, *Sterna Dougali*, one male, two females, near Holyhead,
N. Wales.

Mr. James Oliver.

Common Godwit, *Limosa rufa*, Briss, ♂ Holy Island. Mr. Richd. Howse.

Shieldrake, *Tadorna vulpanse* ♀ Fenham Slake.

Guillemot, *Uria troile*, St. Mary's Island.

Two Black-headed Gulls, *L. ridibundus*, Monkseaton.

Greater Black-backed Gull, *L. marinus*, Newton-by-the-Sea.

Herring Gull, *L. argentatus*, Newton-by-the-Sea.

Black-headed Gull, *L. ridibundus*, Monkseaton.

Brent Goose, *Anser brenta*, Beadnell.

Cormorant, *Phalacrocorax carbo*, ♀ immature, Newton-by-the-Sea.

Two Common Gulls, *L. canus*, immature and mature winter, Monkseaton.

Ringed Dotterel, *Charadrius hiaticula*, Cullercoats.

Puffin, *Fratercula arctica*, ♂ large specimen, Fenham Flats.

Heron, *Ardea cinerea*, Kirkcudbrightshire.

Teal, *Anas crecca*, ♀ Seaton Sluice.

Two Lesser Black-backed Gulls, *L. fuscus*, ♂ ♀ mature, Northumberland.

Mr. John Duncan.

Iceland Gull, *L. leucoptera*, ♀ immature, Newton-by-the-Sea. Purchased.

Two Fulmars, *Procellaria glacialis*, ♂ caught near Redcar, Oct., 1894.

Purchased from Mr. Pearce Coupe.

Tinamou, *Tinamus vermiculatus*, from Plains of Bogatá, Columbia.

Mr. S. J. Da Costa.

Mantell's Apteryx, *Apteryx Mantelli*, ♂ kept alive at Haggerston Castle,
Northumberland.

C. J. Leyland, Esq., Haggerston Castle.

Golden Eagle, *Aquila fulva*, ♂ shot at Loch Rannoch, Perthshire.

Bryan Cookson, Esq., Oakwood, Wylam.

Little Auk, *Mergulus alle*, Marske-by-the-Sea.

Purchased from Mr. Pearce Coupe.

Glaucous Gull, *Larus glaucus*, ♂ Marske-by-the-Sea.

Presented by Mr. Pearce Coupe.

Sundry Birds' Eggs for the Raine Collection. F. Raine, Esq., Hyères.

- Sabine's Gull, *Xema Sabinii*, summer plumage, mature, Davis Straits.
Mr. R. N. Kerr, Dundee.
- Red-necked Grebe, *Podiceps ruficollis*, winter plumage, Holy Island.
Mr. Thos. Thompson, Winlaton House.
- Buzzard, *Tierra del Fuego.* *Mr. P. Hobbs.*
- Three Nests of Weaver Bird from neighbourhood of Calcutta.
Master Guy Clephan.
- Peregrine Falcon, *Falco peregrinus*, Kirkcudbrightshire.
Mr. Geo. E. Crawhall.
- Egg of Barn-door Fowl, with circular opening at small end, not covered with shell but only a thin film, laid at the Mains Farm near Warkworth.
Mr. John Short, Newton Hall, Felton.

REPTILES.

- A large Viper killed at Gibside. *Mr. Johnson, Byer Moor, Burnopfield.*
- A small foreign Snake, caught in a fruit warehouse in Newcastle.
Mr. John Fulton, Jesmond Road.
- Skin of Lizard, Pietermaritzburg, Natal.
Mr. F. Fearne, Neale, Pietermaritzburg.
- Skin and rattle of Rattlesnake, from California. *Mr. R. Y. Green.*
- Specimen of Blind-worm, Shotley Bridge. *Mr. John Jackson.*
- Vertebral column of large Snake, Darjeeling, India.
Mr. W. F. Henderson.
- Snake Skins from S. Africa. *Mrs. Gethin.*

FISHES.

- Rostrum of Saw-fish *Mr. G. R. Rome, Eldon Street.*
- Two specimens of the Scad, *Caranx trachurus*, from the trawlers, North Shields. *Mr. Wm. Cumming.*
- Jaw of Porbeagle, *Lamna Cornubica*, caught near Trow Rocks.
Mr. J. Duncan.
- A Sapphirine Gurnard, *Trigla hirundo*, caught off the mouth of the Tyne.
Mr. R. Howse.
- Muller's Topknot, *Rhombus hirtus*. *Mr. D. Robinson, High Bridge.*
- Large specimen of Grey Mullet, *Mugil capito*, caught in a salmon net at Dunston Battery on the Tyne. *Mr. Robert Robson, Derwenthaugh.*

MOLLUSCA, INSECTS, ETC.

- A few specimens of Anodon, from a pond in Bushbridge Park, Godalming.
Mr. W. Cosens Way.
- Two specimens of *Helix pomatia*, from Glion; five of *Lithodomus dactylus*, from Toulon. *Mr. F. Raine, Hyères.*
- Bone of Cuttlefish from Mediterranean, and other specimens.
Mr. G. R. Rome.

Limapontia depressa, Seaton Sluice; *Actæonia corrugata*, Sea-Houses, North Sunderland

Prof. G. S. Brady.

Specimen of the Bichir, *Polypterus bichir*, and specimens of Unionidæ from the Upper Nile.

Mr. Robt. C. Clephan.

A small collection of Shells collected on the coast of South Africa, at Port Alfred, 1894.

Mrs. Gethin, Gorseland, Camberley.

A small collection of Insects from South Africa.

Mrs. Gethin, Gorseland, Camberley.

A small Longicorn Beetle, *Astynomus ædilis*, Winlaton, and a specimen of

Sawfly, *Sirex gigas*, ♀ Bishop Auckland.

Mr. John Duncan.

Nest of Wasp, *Vespa*, from Riding Mill.

Mr. Ernest Scott.

Three singular Cocoons of a Moth, from the River Plate.

Mr. W. M. Pybus.

Specimens of Beetles from Corsica.

Mr. F. Raine, Hyères.

Scarabæus sacer from Upper Egypt.

Mr. R. C. Clephan.

Sawfly, *Sirex gigas*, Barrow-in-Furness.

Mr. John Duncan.

A bunch of Barnacles, *Lepas anatifera*, attached to a glass bottle floating in the sea off the North Coast.

Mr. Pape, North Shields.

A group of *Lepus fascicularis* attached to vesicular float of their own formation. Washed on shore near Saltburn-by-the-Sea, Oct. 25, 1894.

Mr. M. L. Thompson, Saltburn.

BOTANY.

A small collection of Plants from the neighbourhood of Campbelltown near Sydney, N.S. Wales.

Mr. Matthew Swinburne, St. Thomas Place.

Fruit of the Doum Palm from Upper Egypt.

Mr. R. C. Clephan.

Six specimens of *Carex incurva*, Lightf., from Holy Island.

Gathered and presented by Prof. Daniel Oliver.

1894.

MINERALS AND FOSSILS.

July 21. Slab of shale with casts of *Anthracosia robusta*, *A. acuta*, and *Microconchus carbonarius*, Busty Bank Seam, Consett Iron Co., Derwent Pit.

Mr. Nathan Thompson.

Sept. 18. Two plaster casts of *Bothriolepis Canadensis*, one of *Pterodactylus crassirostris*, and one of *Mesosaurus tenuidens*, Albania, South Africa.

The Rev. Canon Norman.

Oct. 6. Specimens of "Cone-in-Cone" and some pieces of Shale with long lath-shaped Crystals of Selenite, from Marshall-Lane Tunnel, Leeds.

Mr. George Irving.

Oct. . Specimens of Coal, Basalt, etc., from the Hawkesbury District, New South Wales.

Mr. Walton Brown.

Nov. 27. Specimens of "Cone-in-Cone" from the shale above the Beaumont Seam, Duntson Colliery.

Mr. Nathan Thompson.

1895.

- Jan. 11. *Myalina crassa* juv.—from the Ironstone-Shale Bed, Redesdale.
Mr. John Dunn, per Rd. Howse.
- „ 26. A block of “Ganister” and a piece of Fire-clay.
J. Gregory & Co., Deepcar, near Sheffield.
- „ 28. Pieces of Precious Opal from Queensland.
Fred. Ralph Carr, Lympston, Exeter.
- Feb. 11. Syenitic Granite—1, from Syene, Upper Egypt, 2, from Statue of Raamses 2nd; 3 and 4, from 2nd Pyramid; Diorite from broken Statue of Khafra, builder of 2nd Pyramid; Igneous Rock fragment picked up near the Pyramids; pieces of Tertiary Limestone,—pieces from Temple of Deir el Bahr; pieces from Pyramids of Gizeh shewing mode of joining the stones; and pieces from outside of Pyramid; pieces of Nummulite Limestone, Alabaster, etc., from Egypt.
Robt. C. Clephan.
- „ 21. Granite from Cottonwood Canyon, Utah (the Mormon Temple built of this stone); Stalactite from Cash Valley, Utah.
Mr. Joseph Ridley, U.S. Am.
- Mar. 11. Fossil Teeth of several species of Shark from the Carolina Phosphate deposits
Mr. G. Morley, Byker.
- April 13. *Anthracosia* and *Anthracoptera* and pieces of “Cone-in-Cone” from the shale above the Beaumont Seam, Dunston Pit.
Mr. N. Thompson, The Teams.
- „ „ Specimens of Whin (Dolerite?) from a dyke under the Town Moor.
Mr. Stephenson.
- May 18. Fossil Shells, Bones of *Ichthyosaurus*, Wood, etc., from the Main-Limestone (Middle Lias), Cleveland.
Chas. Wm. Ware, Grosvenor Place.

1894.

ETHNOLOGY.

- Aug. 29. A large stone Adze or Celt.
J. D. Scott, Esq.
- Nov. . A piece of old Wooden Water-pipe from Saville Row, formerly used to convey water from the Moor to the Town.
W. G. Laws, Esq.
- 1895.
- Feb. 5. A Balance for Weighing Guineas.
R. Y. Green, Esq.

VIII.—*On a Portion of a Raised-Beach on the Fulwell Hills, near Sunderland.* By D. WOOLACOTT, B.Sc. (Durham), Honours Medallist in Geology and Physiography, South Kensington.

A RAISED-beach, which probably occurs at two distinct levels, and two sea-worn caves have been recorded as occurring at the Whitburn Lizards on the eastern part of Cleadon Hills, and since they are closely connected with the subject of this paper it will be well to briefly notice them.

According to Professor Lebour the exposure of the raised-beach, which occurs at a lower level, is a typical example of one, being traceable along the eastern side of Cleadon Hills from Whitburn to Marsden, and almost completely round them. ⁽¹⁾ The village of Cleadon, which lies rather over one hundred feet above sea-level, is built upon it, as the Geological Drift Maps of Sunderland and district clearly shows. It has lately been well exposed in a gravel pit made to the west of Cleadon Hall, near the road between Cleadon Lane station and Cleadon village. At the present time a deposit of gravel about ten feet thick occurs, resting on a bed of yellow sand, which is distinctly false bedded, and of which about seven feet is exposed. Professor Lebour informed me some time ago that rolled flints of a large size had been found in this gravel, several of which I have since collected out of the same bed.

The other exposure, which occurs at a slightly higher level on the same hills, has only been noticed on the north-eastern side of them, good sections of it, which Mr. R. Howse studied, being exposed some years ago in a Railway cutting at Whitburn Lizards. The Railway runs along the hundred feet contour line at this place. ⁽²⁾

On the eastern side of these hills a sea-worn cave was discovered in 1878, whilst another was found close to it a year later. They both lie at a height of one hundred and forty feet above sea-level. ⁽³⁾

To the south of Sunderland beds of sand and gravel, in some places false bedded, occur resting on boulder-clay. They can be traced along the coast from Hendon to a distance beyond Seaham Harbour, being well exposed near the Salterfen Rocks, where beds of yellow sand more than twelve feet in thickness can be seen overlying the boulder-clay. ⁽⁴⁾

While examining the Magnesian-Limestone at Fulwell Quarries, I incidentally saw that the workmen, in clearing a ledge for blasting purposes, were cutting through a superficial deposit of gravel and sand. This proved to be a raised-beach, two splendid sections of which are at present exposed on the north side of the hill on which these quarries are, and therefore on the side which faces the Cleadon Hills, on which the raised-beach and sea-worn caves that have been already noticed occur. Between these two hills there is a long stretch of low ground about a mile in width. This is occupied by boulder-clay and other superficial deposits, which evidently fill up a pre-glacial valley of denudation.

Fulwell Hill lies about one and a half miles to the north of Sunderland, and reaches a height of two hundred and thirty feet. It is composed of Magnesian-Limestone, belonging to the compact, earthy, and Crystalline Limestone of King, and the Upper division of Howse.

The best section of the raised-beach occurs at a height of about one hundred and forty feet above sea-level, and consists of every gradation between a fine sand and a coarse gravel. The bedding can be more or less distinctly seen throughout the whole section, the wedge-shaped nature of it being specially noticeable. The sand, often containing washings of clay, occurs in a gravel which increases in coarseness to the bottom of the section. Above the deposit there lies a layer of soil and brown clay rather more than a foot in thickness. The first section shows the nature of this portion of the exposure.

This passage upwards from a coarse shingle to a fine deposit of gravel and sand would seem to indicate that the sea-shore was gradually sinking as the beach was being formed.

The alteration in the character of the deposit, that takes place

in the higher parts of the section on the eastern side of it, is also very interesting. It can be seen to pass very sharply from a very coarse shingle into a fine gravel and sand. The nature of this change is shown in the second section.

The pebbles that form the coarse shingle are principally composed of Magnesian-Limestone, some of which are very large. In the higher parts of the deposit few of other composition occur, but as it descends the hill, the proportion of other pebbles increases till they form the major portion of the deposit. Pieces of Carboniferous Limestone and Grit, coal, felsite, and whin, all of which have probably been derived from the boulder-clay of the district, are present along with those of Magnesian-Limestone. They all bear traces of having been water-worn for some time; indeed, several pieces of the latter rock, which have been derived from the concretionary layers of that formation, are perfect spheres. Since finding flints in the gravel at Cleadon, I have searched for them in this deposit, and have obtained several in the portion that the men are at present working. The occurrence of flints in this deposit, as well as at Cleadon, is worthy of further investigation.

In many places the pebbles have been cemented together by materials derived by the percolation of water from the Magnesian-Limestone ones of the deposit. Near the cliff, which will be noticed shortly, this cemented material was in one part as hard as concrete. Another feature worthy of notice is the decomposition of the last-mentioned pebbles, whenever the deposit partakes of a clayey nature.

At one interesting point, as shewn in the third section, the raised-beach can be seen resting on a typical, hard boulder-clay, which is undoubtedly in situ, and contains some scratched and glaciated boulders. The Magnesian-Limestone takes a small synclinal bend, and in the trough so formed a section of that clay, about sixty feet long and reaching ten feet in thickness, is exposed with a portion of the gravel resting directly on it. The clay, which in all probability covered the whole surface of the limestone⁽⁵⁾ on which the raised-beach now rests, has been denuded away except in this hollow. In all other parts of the

section the deposit lies directly on the surface of the limestone, which is smooth and evidently sea-worn.

At its highest point on the west, the deposit is stopped by a vertical cliff, which is about four feet high in the portion at present exposed, but in one part, according to the workmen, it reached nearly eleven. This is undoubtedly the same as the low terraced cliff shown in the section in Mr. J. W. Kirkby's Paper "On the occurrence of Sand-Pipes in the Magnesian-Limestone," to which fuller reference will be made later.⁽⁶⁾ The fourth section shows the nature of this cliff and the character of the deposit occurring near it.

There is nothing to indicate the existence of this cliff in the nature of the surface of the ground. Against the face of it pieces of Magnesian-Limestone which are not sea-worn lie, but about two feet from it this changes abruptly into a very coarse shingle. This appears to be the old sea-cliff, and it is remarkable that its height above sea-level should be about the same as the sea-worn caves on Cleadon Hills. The deposit of gravel and sand appears to mark the opposite shore of the arm of the sea, which once covered the low-lying ground between Fulwell and Cleadon Hills, stretching right round the latter, while Boldon Flatts and all the low-lying ground in the vicinity was submerged.⁽⁷⁾ From the contour of the land it would seem probable that this would be connected with the Tyne near Jarrow Slake, and further down that river.

I have traced the deposit round on to the east side of the hill for a quarter of a mile; on this face a layer of very fine soft sand from three to six feet in thickness occurs. The bedding can be distinctly seen, but few pebbles occur in it: a little higher up the hill it passes into a shingle similar to the one already described, but very little of this is exposed.

In Mr. J. W. Kirkby's Paper a similar deposit of sand is shown to have occurred on the south side of the quarry, but none of it is exposed on that side of the hill at the present time.⁽⁸⁾ Thus the deposit must have extended on the north, east, and south side of Fulwell Hills, and in all probability extended right round them. During the time therefore that all

the low ground around Cleadon and Fulwell Hills lay beneath the sea, these were both probably islands.

When standing on the top of the last-named hills and looking down towards the sea and Sunderland, it is evident, unless we assume that a very local rising of the land took place, that all the low-lying ground along the north-east coast of Durham would probably be submerged at the same time; and we have evidence of this in and near Sunderland. Near Tunstall Road in that town beds of sand and gravel occur resting on boulder-clay; whilst to the south of it similar beds occur all along the coast⁽⁹⁾ as before stated, and it is more than probable that the deposit on Fulwell Hills is the raised-beach of one of the arms of the sea in which these beds were deposited, and the upper parts of the boulder-clay re-arranged by marine currents. From the large number of pebbles characteristic of that clay found in the raised beaches on Cleadon and Fulwell Hills, it is apparent that this clay must have undergone a great amount of denudation.

From the regularly bedded nature of the deposit on Fulwell Hills, and the manner in which it lies, it seems to have been but little disturbed since its formation; the rising of the land through one hundred and forty feet since then therefore appears to have been very uniform and gradual.

Mr. Blythe and I have found a few fragments of shells in this deposit. They occur principally in a very fine layer of gravel near the bottom of it, one or two specimens were, however, collected in the coarser gravel, but as a rule they are very much broken up. The following have been identified: *Cyprina islandica* and *Littorina* (?).

It may also be worthy of notice that the beach at present forming in front of the boulder clay at Hendon is very similar to the raised one on Fulwell Hills.

In the Paper by Mr. J. W. Kirkby, before referred to, a series of sand-pipes, or tubular cavities filled with sand, are noticed as occurring on the slopes of Fulwell Hills, and, although I have not seen any of these pipes, he undoubtedly deals with the same deposit as that now described. He does not treat of it

as a raised beach, but refers to the sea-worn surface of the limestone at one place.⁽¹⁰⁾

My best thanks are due to Mr. James, manager of Fulwell Lime-Works, for giving me permission to study the section at my convenience, and also to Mr. Blythe for examining the deposit on some occasions with me.

REFERENCES.

1. Professor Lebour's "Geology of Northumberland and Durham," p. 19.
 2. Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne, 1877-9, p. 364.
 3. Mr. R. Howse on "Old Sea-caves and Sea-beach" at Whitburn, in the same Transactions, 1877-9, p. 361.
 4. See Geological Drift Map, New Series, No. 21.
 5. Mr. J. W. Kirkby "On the occurrence of Sand-Pipes in the Magnesian Limestone of Durham." *The Geologist*, 1860, p. 295.
 6. Section in Mr. J. W. Kirkby's Paper. *Geologist*, 1860, p. 294.
 7. Professor Lebour's "Geology of Northumberland and Durham," p. 19.
 8. Section in Mr. J. W. Kirkby's Paper. *Geologist*, 1860, p. 329.
 9. See Geological Drift Map, New Series, No. 21.
 10. *Geologist*, 1860, p. 295.
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EXPLANATION OF PLATE VI.

SEC. 1. Section of raised-beach at Fulwell Quarries resting on Magnesian-Limestone, and consisting of a deposit of gravel and sand, covered with brown clay and soil.

Scale: $\frac{1}{4}$ of an inch to 1 foot.

SEC. 2. Section to show manner in which deposit of gravel passes abruptly into one of fine sand, as it passes down the side of the hill.

Scale: $\frac{1}{10}$ of an inch to 1 foot.

SEC. 3. Section to show portion of raised-beach resting on boulder-clay with Magnesian-Limestone beneath. The section faces up the hill.

α —Deposit of sand and gravel similar to that in the first section, but which has been cleared away by the workmen.

Scale: $\frac{1}{16}$ of an inch to the foot.

SEC. 4. Section to show old sea-cliff with breccia of Magnesian-Limestone (α) against it, passing abruptly into beds of gravel and sand, which rest upon the Magnesian-Limestone.

Scale: $\frac{1}{10}$ of an inch to 1 foot.

ADDRESS TO THE MEMBERS OF THE TYNESIDE
NATURALISTS' FIELD CLUB.

READ FOR THE PRESIDENT, THE REV. ARTHUR WATTS, F.G.S., F.R.G.S.,
AT THE FORTY-NINTH ANNIVERSARY, HELD IN THE COMMITTEE
ROOM OF THE NATURAL HISTORY SOCIETY ON 5TH DAY MAY, 1896.

LADIES AND GENTLEMEN,—It is my honour, a second time, to render you a Presidential Address; and that honour is to me enhanced by the fact that it is given at the beginning of the Jubilee year of this Club's existence; the first of what, we all trust, will prove a series of Jubilees, for the love of nature and of nature's God should never die out in the human race.

My first duty is to speak of our Club's work in 1895. We held six Field Meetings and a week's meeting of the Museums' Association. At all of the former I was present, and at most of the latter, so can speak of direct knowledge.

FIRST MEETING, Thursday, 23rd May. A good beginning; fourteen present, all meaning business; and a glorious day. Little delay at Morpeth before off up Wansbeck Valley to Angerton in the hands of two splendid guides in Mr. Egdell and Mr. W. Davidson, head master of Morpeth Grammar School. To the latter we owe much, but can owe no more, as he was, a few months later, called hence. Ere reaching Angerton Station we passed the site of an ancient lake, extending once from Meldon to Middleton. A long mile, and we were at Bolam; at least all that remains of its once Castle, Rectory, Church, inn, "and 200 slated houses" (how many thatched is not on record), with its weekly market and yearly fair. A better deserted village England cannot show. Except Lord Decie's House, the Rectory and Church, all is gone save a few walls, two doorways, and a few earthworks. The low towered Saxon Church of St. Andrew was seen to advantage under the guidance of the genial Incumbent, the Rev. R. E. Thomas, who indicated the xith., xivth., and later centuried features. The fine views northward were enjoyed from the nicely-kept churchyard.

Promptly Lord Decies had granted leave to go over his house, but most found the little lakelet and island more attractive. There the rooks had justified their name by robbing two ducks' nests, but we saw one with nine eggs belonging to a Caroline Summer-Duck, and another of a hybrid, half Mallard, half Call Crested-Duck. The pond is wired for protection against the foxes.

The scanty remnants of the Castle, close by, and the surrounding British earthworks next got limited attention, as we all made our way to the artificial Bolam lake, once bog, and its adjoining heronry. The keeper, Mr. White, conducted us, to the evident alarm and annoyance of the parent-birds, to the four nests, all that remain of fourteen, last year, in the heronry; perhaps in consequence of the exceptionally long and severe winter just ended. Some carefully inspected a cart load of sticks, once a heron's nest; another, and yet another, for the trees carrying them had been felled.

A second British camp on State Hill drew the attention of some, and after the lightest of light refreshments, we reluctantly left Bolam for Meldon, some diverging to visit Gallowhill Hall, suggestive of the fate of mosstroopers (when caught), but most making for the "Fox and Hounds," as hungry as hunters.

By the kindness of Mr. Clayton Swan, Meldon House and gardens were enjoyed under Mr. Finlay's guidance, who also exhibited his unrivalled private collection of Moths and Butterflies, which deserved more attention than we could give. A scramble back to Meldon Station, and Morpeth reached, the "Black Bull" did as little for its reputation, as Mr. Hopper did much, in opening his fern and orchid houses to the party, and so ended a most enjoyable if somewhat fatiguing day. It was a Naturalists' day; the Botanists got little out of the common, save a few bog plants; but all got abundant sunshine, fresh air, exercise, fine views and genial company.

SECOND MEETING, Tuesday, 18th June. A very early train to Gilsland and a wet morning, so only eight sat down to breakfast at the Shaws' Hotel. Armed with umbrellas and mackintoshes

we drove off in a drizzle, and had our reward, for the sky cleared and we had no more rain till night. Birdoswald, with its Roman station, was passed, and then the meagre ruins of Triermain Peel-house. At Askerton a stop was made, some Wall-rue (*Asplenium Ruta-muraria*), and other ferns gathered, and the winding stairs of the Castle mounted, charming views were got over Cumbrian hills, Solway Firth, and South Scotland. Seats resumed, the wilds of bleak Spadeadam waste were enjoyed at a distance, a few *Orchis latifolia* were secured, and then all eyes centered on the Castle which marked our goal, Bewcastle. Once an important place, now a house or two, the Church and Rectory, an inn and a farm, with the ruins, are all that remain. The "Lime Kiln Inn" offered its best and could no more. Kirkbeck crossed, the boundary of the ancient British camp and its outlying earthworks were patrolled; the stone walls of the subsequent Roman camp traversed, and the still later Norman Castle leisurely examined, when all gathered at the foot of the earliest Christian English Cross in the kingdom. Once a cross some seventeen feet high, like its only sister at Ruthwell, now a slender pillar fifteen feet high, tapering from a two feet square at the base to a sixteen inch square at the broken summit. The top was broken even in Camden's time, 1607, and an insertion in his book at the Bodleian Library, Oxford, records its recovery. The beautiful designs on the four faces of the shaft are wondrously well preserved, and on it, in Runic characters, one may yet spell out the earliest known words in the English language.

Besides the names of such well-known persons as Oswy, Wilfrid, Alefrid, Ecfrit, and Cyneburga, we find "kings, kinges, preast, sowl, this, beacon, sett, ean (one), and at least twice, the name of Jesus. By this cross, 1895 joins hands with 670, and let us hope hearts too. When these features had been carefully examined, the President gave a brief historical sketch. This cross was set up in the year 670 in what was then, as it is now, a churchyard; when the English nation was not yet born, but was quickening to the birth; when Jute, Saxon, and Angle with British help were merging into Englishmen, and Britain

into England. This cross links us directly to those far away times where history melts into mystery. With it we are in the company of two royal houses, those of Northumbria and Mercia; of good King Oswy's sons, Alcfrid, Ecfred and Elfwine; of fierce Penda's daughters, Cyneburga and Kineswitha, and their brother Wulfhere; of saintly Etheldreda and imperious, wilful Wilfred; of sweet-voiced Cædmon, and the Venerable Bede, fathers respectively of English poetry and English history. Oh! we were in goodly company, 167 years before England became united under one king, and in the very year when Theodore began his work of forming an united Church in our land.

But for a cutting east wind we should have lingered longer to let this goodly cross endow those old histories with life. Though the actors have long crumbled to dust, the witness, battered, still stands erect. But the year before, Wilfrid had astonished prince and peasant with his glass windows at Ripon, and this same year Cædmon was singing his sweet songs to Hilda at Whitby, whilst two years after Queen Etheldreda exchanged crown for veil, and the very next year Bede was born by Sunderland. Still a few years, and Ecfred's Northumbrians rush through South Scotland and Ruthwell gets its beautiful English cross, which the Angles leave, happily in Christian hands, when they in turn are driven back by British arms, losing their brave and good King Ecfred in battle.

The runes on the cross probably tell us, on the west and south sides, besides the words "Jesus Christ" over a figure in high relief:—"This slender beacon Hwaetred, Wothgar and Olfwolthu set up in memory of Alcfrith, a king and son of Oswy, in the first year of Ecfreth, king of this realm." On the north side we read "Wulfhere, king of the Mercians, Cyneburga (wife of Alcfrid) and Kineswitha (both sisters of Wulfhere)."

After entering the plain and forlorn church, a reluctant last glance at the cross was given and a botanical hunt was made. Then driving back to Gilsland, of necessity by the same route, we all dined together, then elected three new members, when most returned to Newcastle, but a few still lingered at attractive Gilsland. Besides the plants already referred to, may be

mentioned, as found by Mr. Cobb, *Equisetum sylvaticum* and *palustre*, *Saxifraga aizoides*, and *Euphorbia cyparissias*.

THIRD MEETING, a double one, Thursday, 11th, and Friday, 12th July, at Appleby, when the accommodation of the comfortable Tufton Arms was not severely taxed. The earlier arrivals had visited the quaint yet cheery quadrangle of St. Ann's Hospital; the ivy-clad venerable keep and charming walks and gardens of the Castle, besides the sturdily-loyal obelisk by the Castle gate, the ancient Moot Hall, handsome Market Cross, the narrow weinds, and the venerable Church of St. Lawrence, with its unique cloister, ere I arrived. We had a somewhat grim laugh over the spurious Roman stones opposite the old Grammar School. After dinner the fineness of the evening tempted us to a stroll to beautiful Bongate. Crossing the stream and passing the mill, we reached St. Michael's, to find a church with a south transept, but instead of a north one, there stood the Church's picturesque square tower. Returning into the Station Road, a fair circuit of the town was made and a real Bull-ring seen *in situ*.

Next day, after breakfast, High-Cup Nick was reached on foot by Murton and Harbour-Flat, under the skilful guidance of Mr. Faraday Spence, one of the Secretaries. The day proved lovely, hence commanding views were obtained of the hills of the Lake district, and the ever-changing lights and cloud-shadows added another charm. Late specimens were gathered of *Primula farinosa* and *Pinguicula*, and curious rounded concretion-like masses of brown jelly, varying considerably in size, were found completely coating the stones in some streams. Some Grass of Parnassus was picked, but the great treat of the day was to watch the graceful flights and listen to the troubled cries of a pair of Peregrine Falcons, who were alarmed for their young through the desire of some of our party to get a good look at the nest. It is rare now-a-days to find falcons nesting in our neighbourhood. May I add, the young falcons are well and assiduously trained by the parent-birds. Their education begins early. Daily are their flights lengthened, and then they are

taught to strike their quarry thus:—One of the parents will shoot up with the quarry followed by her eager youngsters; suddenly it is dropped, when down they dash and rarely does it reach the ground. Of course the quickest stoop secures the prize. Thus they soon learn to care for themselves, and as soon as ever they can do this, they are ruthlessly driven off the old domain, and are not allowed to return or there would soon be a famine in the land.

After a tough scramble the head of High-Cup Nick was reached, and a few specimens of *Sedum Rhodiola* secured, when the party, after resting awhile and enjoying the wide and varied landscape, returned by Dufton Fell and Pike to the Black Bull at Dufton, where is some fine old china and a well preserved, though worm-eaten, "Piggin," made 200 years ago. Showers somewhat lengthened the miles between Dufton and Appleby, which place was, however, reached in due time, passing the new Grammar School and many a rose-clad cottage with well-stocked and well-cared-for garden. Most of the party returned home that evening, all well pleased with the visit.

MUSEUMS' ASSOCIATION WEEK, July 23rd to 27th. The members of our Club joined heartily in the efforts made to secure a pleasant as well as a profitable week for the Museums' Association, which this year honoured Newcastle by holding here its Annual Meeting, and by electing our good friends and oft-time Presidents, the Rev. Canon Norman, as its President, and the Rev. Canon Tristram and W. A. Watson-Armstrong, as its Vice-Presidents. The Local Committee, which was a strong one, catered well for our guests, and Prof. M. C. Potter, as Secretary, was indefatigable.

At the opening meeting on Tuesday, July 23rd, in the Physical Lecture Theatre of the College of Science, Dr. Norman delivered a Presidential Address, which was requested to be printed. On Wednesday, after a busy morning, Durham Cathedral and Castle were visited under the guidance of Dr. Tristram, and the party drank tea with Mrs. Tristram before returning to Newcastle for the *Conversazione* in the Hancock Museum. At

the Cathedral the recently-discovered apsidal terminations of nave and aisles were eagerly and curiously scanned.

On Thursday the morning was again devoted to business, but the afternoon was spent in visiting the President's extensive and unique collections at Burnmoor Rectory, when all reassembled for the Association dinner at the County Hotel, Newcastle.

Again the morning was wholly devoted to business on Friday, and the afternoon to mixed pleasure and profit, but the pleasure was somewhat marred by heavy rain-showers, which led to some re-arrangement of the programme, and one of which shortened a visit made to the peculiar botryoidal Magnesian rocks at Roker. Mrs. Cameron and other Sunderland ladies kindly provided tea in the Mayor's Chamber, after which the Museum and Winter Garden were seen under the guidance of R. Cameron, M.P.

A reception and dinner by the Mayor of Sunderland in the Town Hall practically ended, and well ended, the programme, for the projected excursion for Saturday, to the Roman camp of *Cilurnum*, at Chollerford, fell through. The kindly hospitality extended to the Association by Sunderland will not readily die out of the memories of those privileged to partake of it. How was it Sunderland stood alone?

FOURTH MEETING, Thursday, August 22nd. This was a departure from the ordinary Field Meeting, as our *field* was, for this day, the sea. We skirted the coast for about twenty miles, from the mouth of the Blyth river to Coquet Island, spending, however, most of the time in Druridge Bay. It was the largest, and in more respects than one, the most successful meeting of my Presidency, and that largely through the labours, willing labours, of our late President, John Foster Spence, who, we all deeply regretted, was prevented from joining us by severe family affliction. The unavoidable absence of Prof. Brady was another cause of regret. The party numbered twenty. The day was glorious, and the sea a dream, over which the fog veil fell fitly as the day closed and we reached our landing place 9.15 p.m., having been at sea from 9 a.m.

In the early part of the day a slight and shifting fog had

added a charm, by giving us momentary picturesque peeps at the coast as we crossed Camboise Bay, passed Newbiggin, and reached the gleaming sands of Druridge Bay. After that, brilliant sunshine and a perfectly smooth sea, was the order of the day.

By various routes the party had assembled at Blyth Quay, were welcomed cheerily by Mr. John Dent and conducted on board his steamer, the "Livingstone," generously placed by him at the service of the Club. His experience and knowledge, as also those of Mr. Storey, the Fisheries' Inspector, were ungrudgingly placed, throughout the day, at the command of the whole party, who freely and thankfully availed themselves of this second act of generosity. We had hoped to have made this a dredging expedition, but were obliged to be content with a trawl. The beam was let down five times, but got fouled the last time. The four successful trawls yielded us examples of the Angler or Devil-fish, *Lophius piscatorius*; Plaice, *Platessa platessa*; Dab, *Platessa limanda*; Sole, *Solea solea*; Turbot, *Rhombus maximus*; Skate, *Raia Batis*; Gurnard, *Trigla gurnardus*; Haddock, *Gadus aeglefinus*; Whiting, *Merlangus merlangus*; a small Cuttle-fish, *Loligo media*; a large pink Medusa and many Crabs, but nothing exceptional. Both external and internal parasites were obtained from the fishes, and bottled in considerable numbers. Samples of the bottom were got, in five-fathom water, in the south part of Druridge Bay, off Cresswell, and in rather less depth, in the north part of the same bay, near Coquet Island. These have not yet been carefully examined. The brilliance and play of colours, and the peculiar metallic lustre, especially on Gurnet and Haddock, when newly caught, were a revelation to more than one. Line-fishing afforded much amusement, and was very successful. One Gurnet, caught by a spoon-bait, had two small Plaice alive in its mouth when hauled on deck. The stomachs of a few fish of each kind were examined. Some were found empty, others made it manifest that each kind has its special and favourite food. Thus the Plaice feed on *Psammodus* almost entirely; Dabs on Swimming Crabs, small Cuttle-fish, and some small Shell-fish, but not on *Psammodus*; Sole on

Sand-eels, centipede-like worms, etc., but neither on Crabs nor *Psammodus*; whilst the prey of the Gurnet was small Fish, Eels, Dabs, Plaice, etc. Enormous Tape-worms were rooted on the walls of the stomach of every Turbot, in great tufts, the tangled mass almost filling the cavity; a gruesome sight. The Shell-fish were swallowed entire, and the angular character of the shell fragments showed they were broken by muscular action crushing them against each other.

After the first trawl a table was rigged up on deck, and full justice was done to Mr. Dent's varied and ample spread, not only by the party, but also by a great flock of gulls, who had evidently heard the call to dinner, and by their scrambles and screams over the fragments added a new attraction. After the third trawl came a welcome invitation to tea, in the Captain's cabin, and soon after we turned homewards, making a splendid run, till, near Blyth, the fog made it necessary to go with caution.

With a hearty vote of thanks to Mr. Dent, and signs of our gratitude to the crew, we made our way to the station with the hope that other similar expeditions await us in the near future, and with the certainty that no finer day, smoother sea, nor more genial host can ever fall to our lot.

FIFTH MEETING, Monday, September 30th. A fine day. We were nine. Upper Weardale was chosen because it was expected that the new line from Stanhope to Wearhead would then be open, but delays had arisen early in the year, so Stanhope became our place of meeting instead of Westgate or St. John's.

Most of the party arrived on Saturday, and under Mr. Spence's guidance explored the celebrated marble quarries of Frosterley, and wandered over Fatherley Hill and Collier Law.

Pretty Stanhope Burn afforded charming Sunday walks. On Monday I and others arrived, and we visited Church and Market Cross and Castle, with its grounds; strolled along Stanhope Burn and Wear, and then on the invitation of the Bishop of Richmond, Dr. Pulliène, drank tea with the ladies of his family on the lawn, after being shown over the Rectory, once the home of the celebrated Bishop Butler. Its pictures and venerable curiosities

were duly admired, the figs pronounced excellent and the garden charming. One fig-tree is exceptionally large, and the grounds possess a White Poplar of enormous size considering it is only seventy years old. In the Castle grounds is a Spindle-tree, *Euonymus Europæus*, of extraordinary size, not a shrub but a veritable tree, which attracted immediate attention by its peculiar and brilliant flower-like fruit. Through the prolonged dry and altogether exceptionally hot weather of September this year, flowers were scarce, but seed-vessels were abundant and excellent, and foliage particularly fine and large. Crossing the road by its peculiar bridge, in the remoter Castle grounds lay a derelict eloquent of the past, in an ancient mail-coach, such as last century delighted in. It looked even now almost worthy of finding a home in some museum.

SIXTH MEETING, Friday, October 25th. Again we were nine, and again our last visit was with the Starlings to St. Mary's Island, but they were in less numbers than last year. Bright weather, with some tooth in the air, made the walk from Hartley Station to Seaton Delaval Hall, thence to Seaton Sluice, and on to the island, a real pleasure, enlivened by the discovery of a Hedgehog and two dead birds, the latter probably victims to telegraph wires.

At the Hall the ancient kitchen, the habitable rooms, and some of the old paintings were hurriedly scanned in the west wing, and then the great hall, saloon, spiral staircases of the two towers, and various rooms above and below were explored. Wandering through the deserted and ruined walls of this central block, admiring its handsome style and ample proportions, regretting that so fine an English home should stand desolate and forlorn, it was a positive relief to enter the little Church adjoining, and see its quaint and beautiful xiith century work well cared for. The President pointed out the unusual separation of chancel from choir and nave, and particularly the filling up of the one ancient window left in the north wall. The Church was *en fête*, as the Bishop of Newcastle (Dr. Wilberforce) was coming that afternoon to consecrate an addition to the Churchyard.

After lunching at Seaton Sluice, St. Mary's Island was soon reached. There a formal meeting was held, new members elected, and a most interesting paper read on Spiders, by the Rev. J. E. Hull, of North Shields, who is busy with a new Catalogue of Durham and Northumberland Spiders (since completed), and published in our Transactions, vol. xiii. Even then forty-seven new to our two counties had been found, and two entirely new to science, which are being named, and shortly will be properly described.

A vote of thanks, tea, and then a rush for the train at Whitley, and the year's rambles were over. It only remained to separate with mutual good wishes for next year's Jubilee meetings.

In concluding my address, let me say I rejoice to feel that our Society has been able to earn, during my Presidentship, the gratitude of the Black-headed Gulls; for when the Newcastle and Gateshead Water Company found themselves, for sanitary reasons, compelled to stop the breeding of the Black-headed Gulls on the islands in their reservoir at Hallington, they courteously agreed, in response to a letter from me, to receive a deputation from our Society, and gave such assurance that they would show every consideration possible to the birds, consistent with the maintenance of a supply of pure water, that I felt sure the gulls were not in hostile, but in kindly and sympathetic hands. And so it has proved, for the colony has not been destroyed, but has only had to move its quarters, and is still in the neighbourhood.

And now, ladies and gentlemen, it only remains to me to render my most hearty thanks for the distinguished honour you have done me by a second time electing me your President. Conscious of my short-comings, I have the satisfaction of feeling that I have not only done my best to make the year's meetings pleasant and profitable, but that you also have abundantly shown that those efforts, however imperfect, have not been wholly unsuccessful.

The following gentlemen were elected members of the Club during the year 1895-96:—

BROWN, REV. W. McLEAN... 22, Hawthorn Road, Gosforth.
INGRAM, WM. J. BEDE College, Durham.
UFFORD, J. M..... 20, Lancaster Street, Newcastle.

FIELD MEETINGS, 1896.

(JUBILEE YEAR).

MAY 20TH Ovingham and Whittle Dene.
JUNE 10TH Farne Islands.
JULY 10TH Bardon Mills, Muckle Moss, etc.
AUGUST (Special)... Dredging Excursion off the Tyne.
,, 24TH..... Beal for Haggerston, Holy Island, etc.
SEPTEMBER 25TH... Excursion to English Lakes.
OCTOBER 9TH..... Whitburn and Roker.

The following gentlemen were elected as Officers of the Club for 1896-97 :—

PRESIDENT.

Rev. Canon Tristram, F.R.S. (Durham).

VICE-PRESIDENTS.

T. W. Backhouse.

Rev. W. Johnson.

John Glover.

EX-OFFICIO VICE-PRESIDENTS.

D. Embleton, Esq., M.D.

A. S. Stevenson, Esq., J.P.

Rev. Canon Norman, F.R.S.

Rev. J. M. Hick, B.A.

E. J. J. Browell, Esq., J.P.

John Philipson, Esq., J.P.

Prof. G. S. Brady, F.R.S.

J. F. Spence, Esq., J.P.

G. H. Philipson, Esq., M.D.,
D.C.L.

Rev. Arthur Watts, F.G.S.

HON. TREASURER.

R. Y. Green.

HON. SECRETARIES.

Richard Howse

Thomas Thompson.

Faraday Spence.

COMMITTEE.

Prof. G. S. Brady.

Rev. J. M. Hick.

Wm. E. Branford.

G. H. Philipson, M.D.

E. J. J. Browell

John Philipson.

Joseph Cobb.

W. M. Pybus.

D. Embleton, M.D.
George Harkus.

J. F. Spence.
R. M. Tate.

AUDITORS.

J. S. Forster.

Arthur Tranah.

ABSTRACT OF TREASURER'S ACCOUNT OF TYNESIDE NATURALISTS' FIELD CLUB.

Dr.		£	s.	d.
1895.				
Jan.	To Balance in hand	5	8	8
	„ Subscriptions	59	19	7
	„ Natural History Society on account of printing Transac- tions	50	0	0
	„ Sale of Transactions	5	4	6
		<hr/> £120 12 9 <hr/>		

Cr.		£	s.	d.
1895.				
Jan.	By John Bell printing Transactions	26	0	0
	„ „Journal”	15	0	0
	„ West & Son, Engravers	6	10	6
	„ Hindmarsh, Commission	3	14	0
	„ Secretaries’	4	8	6
	„ Year Book, Scientific Societies..	0	6	0
Dec.	„ Balance	64	13	9
		<hr/> £120 12 9 <hr/>		

TREASURER'S REPORT.

April 23rd, 1896.—Payments examined with Vouchers and found correct,

ARTHUR TRANAH, AUDITOR.

X.—*Life History of Coal.* By the Rev. ARTHUR WATTS, F.G.S.
Read at a Joint Evening Meeting of the Natural History Society
and the Tyneside Nat. Field Club, held on Jan. 31st, 1895.

SUPPOSING the province of a Natural History Society to be as wide as nature itself, we may consider Coal a fair subject for a paper, and the more so as this particular rock belongs to the class of organic rocks; rocks that are the product of organized beings, animal or vegetable; in this case vegetable. Many siliceous rocks being diatomaceous are also of vegetable origin, though others are of animal origin, being formed by Sponges or by Radiolarians. Many, nay even most calcareous rocks fall into the same group, being of animal origin, the product of Foraminiferæ, Mollusca or Zoophytes; whilst there is strong reason for believing that some, at least, of the ferruginous rocks are of animal origin.

We do not propose, to-night, to deal with all the Carbonaceous rocks which are of organic origin, but with those only which, from their economic value to man, are known as Coal; and, indeed, with only one phase of that substance, the phase covered by the words "*Life-history.*" We would justify the title of this paper, "*Life-history of Coal,*" on double grounds,—first, because Coal is the gift of Life, and of nothing else; and second, because it has truly a life of its own.

That Coal is the gift of life, it is scarcely necessary for me to prove to you, many of whom are as familiar with the vegetable fossils as with the chemical composition of Coal. You will all doubtless at once grant there was a time when no Coal existed on the earth. Its constituent parts, carbon, oxygen, hydrogen, and nitrogen did, but not Coal. These constituents were in the air then as now. The air itself consists of two of them, oxygen and nitrogen. No natural air is dry, and the aqueous vapour thereof supplies another factor in hydrogen, besides increasing the oxygen. And as all air holds some carbonic acid gas (CO_2),

the fourth constituent, carbon, finds a place there. Other elements are there, and in past times in very different proportions to those of to-day, but these particular four were always there, so that truly every seam of Coal that the earth's crust now holds, whatever its age, has first of all been overhead in our atmosphere. And, but for life, there it must have remained. There is no other known force which could fetch the constituents thence and make them Coal. Living fingers had to stretch upwards and take the Coal bit by bit through long centuries out of the air to clothe the earth's surface, first as vegetation, in all its endless beauty of form. All the Coal of the world has thus been rescued from the air by vegetable life.

Having adorned the surface, vegetation dies, gets buried, it may be deeper and deeper, till now we find some seams of Coal many, many fathoms deep in the crust. The history of every seam of Coal is; first, invisible in the atmosphere; second, on the earth's surface, in all the variety and beauty of root and trunk and branch, of leaf and flower and fruit; and third, in the earth's crust, a gleaming mass of black diamonds. Thus vegetation is and has been one great agency, by which the gases of our earth take solid form in one group of combinations, the carbonaceous. In like manner, animal life is ever taking substances in solution from the waters of the world and turning them into solids of another group of combinations, the calcareous.

These two forms of existing life, the vegetable and the animal, are evidently branches from one stock, and as we come down to the parent stem the dividing line becomes very difficult to trace, so intricate is the dovetailing, so shadowy the line. They are and have always been co-operative friends, mutually accommodating each other, ever since the animal branch started budding.

We, from man to mouse, from fish to fly, from animalcule to whale, the whole animal world are manufacturers, from birth to death, of carbonic acid gas. We take in carbon by our alimentary canals, we take in oxygen by our respiratory organs, and within ourselves they develop heat in bringing about the chemical union of these two elements, and then we turn the manufactured article out into the air for the benefit of our relations the vegetable

world. They stretch out green, hungry fingers to seize the carbonic acid gas; within themselves break up the compound, undoing our work, to fix the carbon, and for our accommodation set free the oxygen, thus returning the compliment. Within the living tissues of the plant this carbon is brought into union with those gases, oxygen, hydrogen, and nitrogen, in such proportions that the product is first wood and then Coal. Life acting through the tissues of the plant is able to use heat and light as the means of bringing about the chemical union of these elements into the organic compounds which form wood. In other words, heat and light by the living plant are converted into chemical action and there remain sealed up. But when the resultant chemical compound is hereafter resolved into its elements, the heat and light so used are restored in their original state and amount. The mutual convertibility of the physical forces and the indestructibility of these forces is beautifully illustrated thereby, and at the same time is demonstrated the superiority of life to any or all of these forces, which become its servants. So from the air the small acorn weighing a few grains becomes the mighty oak weighing many tons, because it is gifted with life. And the residuary legatee of the vegetable world, mother earth, ultimately receives a bed of Coal, so the earth is richer by the labours of these, as it should be by those of all living things, not excepting man. Is man by his mining and manufactures, etc., writing unconsciously a new chapter in the Earth's history?

We take in carbon by our alimentary canals, for black as carbon is, it is ever entering our bodies, strangely enough, in a white disguise. It is odd, but true, that most of the whitest things we know consist largely of carbon: milk, flour, lard; paper and wood; bone and ivory; chalk and marble. But we are digressing. *Revenons à nos moutons.* By the death of the plant we get Coal. The *death* of the vegetable is the *birth* of Coal.

And now we are going to claim for Coal a life of its own. We do not expect all to grant it, but we do hope for a patient hearing and careful consideration. All turns on the definition of life.

The chemist can tell us all the elements of wood, but he cannot make a piece of wood, though he has the elements in abundance. That is because *life* is needed to the making. In the same way, knowing the constituents of Coal and having them in abundance, still he cannot make a piece of Coal. Why? I can only answer as before: because life is needed to the making. What is life? Is there no life but what we know as vegetable or animal? Or can we go back through these branches to a common stock whence they sprang; nay more, go, so to speak, *below* vegetable life to rock life, to elemental life; and *above* animal life to higher forms of life, with embodiment in planet or sun; in solar system or stellar universe, or in all creation? The Christian, at least, cannot say *No*, in the latter direction; nor the Materialist perhaps in the former. Who will presume to limit the bounds of life by human experience, by human appreciation? Somehow, where I see growth, I expect life of some kind in the thing itself. Where I see purpose, plan and aim, I expect life either in itself or in the agent which employs it. These I seem to see in Coal.

When may *matter* be said to live? When it has a definite duty assigned to it, a distinct purpose to fulfil, a particular part to play. Coal has all this.

Is life evidenced by orderly progressive movement, by the definite pursuit of certain ends through a cycle of events variable only within certain limits? Coal does this exactly.

Is life bounded on the one hand by Birth, on the other by Death? Coal is.

Are the successive phases of life: infancy, youth, prime, old age? Coal goes through these.

Must life start with a time of weakness, pass gradually into full strength, and then declining again into weakness pass thence into silence, out of which silence again to emerge, and in its descendant retread the old path? Coal does this.

Is that alive whose work can be cut short, which, in other words, can come to a premature end? Coal can.

It begins life within the womb of its parent the living vegetable. Its parent dies at its birth. It too may die in its infancy. It must be buried to live. Exposure kills it. The peat of

to-day was living vegetable yesterday. Peat is baby-coal, so is wood. Ask the chemist the constituents of either and then of Coal. Brown Coal and lignite are the boy-coal. Bituminous or common Coal is the young man in the prime of life. Anthracite has passed the prime, is getting feeble with age. Graphite is the old man.

The Irish peasant or Highland cotter asks of peat warmth and light and gets them, especially the first, enough for his simple wants. He is asking help of a child.

The Devonshire potter asks of the Bovey-Tracey lignite more help in his artistic calling and gets it from the boy, whose age has brought character and strength. We may ask of our Newcastle Coal anything that Coal can give and get it readily:— Warmth in our homes, light in our streets, colours in our dress, flavourings in our food, saccharine in our ailments. We are asking help of a man, and manly is the response. Do not ask as much of Anthracite, he has gone some distance down hill, but there is fire in the old man yet; only give him time to start and he will warm you thoroughly well, though he can no longer laugh over his work. But as for the venerable Graphite, tottering on verge of the grave, what may you ask of him? Warmth, sweetness, colour, light? Ah, no. He has none to give; and yet not quite none. True; no physical light, but in the blacklead pencil he can give light to the mind, can catch the fleeting forms for the artist; can make the thought of one the common property of all; can lead the child of man into intellectual light. Coal, in his old, old age is not useless. Remember when, this cold night you reach home, and the sturdy young fellow from between the bars of your grate smiles you a welcome, his smiles are returned doubled by the old man from hob and fender.

Is not this career of Coal strangely like life? Once buried the peat or wood must pass as we must, on from youth to age, it cannot stop at any stage, but must become brown Coal, common Coal, steam Coal, Anthracite, Graphite. What if it must be buried to live? What if its life period must be measured by a million of years? Has all life time-limits, much less human time-limits? Vegetable life seeks and gets occasionally a much

broader time-measure than animal life ; Coal gets a measure still larger ; the earth immensely larger still ; and that of the sun makes one feel dizzy to contemplate.

We make bold to claim that all the carbon, at least during this present life phase of our earth's history, is performing a definite duty which is assigned to it, as we human beings and other animals have a duty assigned to us, and as the vegetable world has a duty assigned to it. That as whilst we are performing a duty we live, so whilst discharging a duty carbon lives, passes through a life-phase if you will. Before it reached that phase it may have had other duties not connected with what we understand by life ; after it has passed that phase, there may be, probably is, some other duty to discharge, as remote from what we consider life as the former was. In the earth's history there certainly was a time when carbon could not play the part it now does in connection with the vegetable and animal life of the world, but who will dare to say it led an idle or purposeless existence then, when the waters of the world were yet in the air, and the oldest stratified rocks were yet unformed ? So when we look forward into the future to earth-conditions similar to those existent on our moon, we face a time when animal and vegetable life must cease to be, but carbon will still exist and doubtless for some purpose. We say it will have passed through its life-phase so far as our earth is concerned.

So, in like manner, Silica and other elements of our earth will each at some time have a phase to pass through similar, though not necessarily identical, with that of carbon ; will pass through its life-phase. And that which is true of the part is true of the whole. The earth itself is now passing through its life-phase (still using the word life in its ordinary restricted form of vegetable and animal life). For the earth was once unfitted for such life and will again be unfit. Yet the period before was immeasurably greater than this life period can be, and the after period will perhaps be as much longer. Now we may reasonably ask : Was the earth, as an entity, dead, till animal life existed ? Will it again be dead when these cease to be ? Are the infancy and boyhood of the earth, death ? Is its old age, death, and

only the period of its prime, life? Has not the earth lived from its birth, and will it not live till it ceases to be an earth?

Every planet in our solar system has had a beginning and will have an end, and somewhere between these two events every planet has passed or will pass through a life-phase similar to that which we know here, or logic finds no place in the heavens and analogy is there a snare.

The inevitable deduction from all this is, that if we limit life to the animal and vegetable worlds we are assuming the work of Nature to be purposeless through long æons of time, both before and after this recognized life period, and over vast fields of space. Is it not more reasonable that life other than vegetable and animal does exist, and makes its home on the earth and elsewhere in due course,—some, perhaps, from a human point of view lower in grade, some higher, rising as through that of angel or archangel to culminate in God himself?

NATURAL HISTORY SOCIETY
OF
NORTHUMBERLAND, DURHAM, AND NEWCASTLE-
UPON-TYNE.

ANNUAL MEETING, 14TH OCTOBER, 1896.

REPORT OF THE COMMITTEE FOR 1895-96.

THE past year of the Society, which has been of an uneventful character, has closed with a membership of 276, being a net increase of fourteen members. Twenty-four new members have been elected during the year, six have resigned, and the Society has lost four more of its elder members by death. It must be pointed out that the increase of members is due partly to the circular which, in accordance with the resolution passed at the last Annual Meeting, was issued to the leading residents of Northumberland, Durham, and Newcastle-upon-Tyne. While this circular has not immediately resulted in so large an increase of members as might have been expected, the Committee still hope that its distribution may lead to a wider interest being taken in the welfare of the Society.

The attendance of the public has been, on the whole, much the same as in past years, though on some of the public holidays unusually large numbers have availed themselves of the opportunity of visiting the Museum.

During the year a special outlay has been caused by the repainting of the wood and iron work on the outside of the Museum and the building generally has been kept in a proper state of repair. Notwithstanding the somewhat heavy expenditure which this has entailed, the Committee are glad to report

that they have a balance in hand of £120 : 9 : 7 at the end of the present financial year.

It had long been felt that the temperature of the Museum in winter was insufficient for the comfort of visitors and the proper preservation of the collections, and the Committee accordingly consulted Mr. F. W. Rich, who advised them to increase the heating power by adding a new boiler to the heating apparatus, and to lay down additional coils and to cover the return coils which run underneath the floors of the building with a boiler composition for retaining the heat. This work has now been accomplished with a very satisfactory result, though the more effective heating secured, of course necessitates a greater consumption of fuel and an additional outlay.

It has also been found necessary to erect a chimney specially for the boiler house, which was an improvement much needed and strongly recommended by the Architect, as in the past the flues from the boilers have been carried into the chimney of the Caretaker's house, thereby rendering some of the walls and rooms uncomfortably hot.

HANCOCK PRIZE.—During the year the Committee have received the Fund collected for the Hancock Prize, which Fund has been invested in the names of the Trustees of the Society, and is held by them under the following regulations, which were adopted by the Committee at their meeting in April last:—

REGULATIONS.

1. The Trustees of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne shall be the Trustees of the Fund.
2. The Fund shall be invested and the income shall be used to provide annually one or more prizes of books or scientific apparatus.
3. The Committee of the Natural History Society shall be the managers of the said Fund and the income thereof, and the prizes shall be awarded by examiners nominated by them. Such Committee shall have power to delegate

their duties to a Sub-Committee of not less than three persons, who may or may not be members of the said Natural History Society.

4. The prizes, each of which shall be known as the "John Hancock Prize," shall be awarded for the acknowledgment of field observations in Natural History, whether Botany, Ornithology, Entomology, Molluscan or other forms of life, or Geology.
5. The object of the Fund is not to form a passion for collecting but to stimulate observation and consequent research. The prize shall therefore be offered for the best account of a ramble, with special reference to the common objects noticed in the fields, in the woods, or by the sea-shore.
6. It shall be a direction to the examiners that the prize shall be awarded not for technical knowledge or literary research, but for observation such as can be exercised by persons of ordinary education without special training.
7. The competitors shall be residents for the time being of the Counties of Northumberland, Durham, or Newcastle-upon-Tyne.

Your Committee have, in accordance with the above Regulations, advertised the existence of this Fund, and they have also printed circulars with the conditions under which the essays are to be sent in, and they trust that the announcement and distribution of this prize annually may in some way act as an encouragement to and stimulate the outdoor study of Natural History, for which the late Mr. John Hancock, whose name is associated with this Fund, was so strong an advocate.

It seems desirable to mention that the subscriptions to the Hancock Prize Fund were given chiefly by Mr. Hancock's personal friends and a few others to whom he was well known as an enthusiastic Ornithologist and Naturalist.

The Committee have also to state that during the past year they have had applications for the loan of specimens for teaching purposes from several teachers, and have thus been enabled to lend some of their duplicate specimens to teachers of public and

private schools; and they gladly welcome these applications from those who are desirous to have the use of such specimens for the giving of object lessons in Natural History in schools.

The rooms of the Museum have been used during the year by the Mayor for the purpose of a Reception and Conversazione, which he gave to the members of the Reformatory and Refuge Union on their meeting in this city.

The following valuable donations, which may be specially mentioned, will shew that the collections of the Society have been considerably added to in several departments during the year. Frederic Raine, Esq., formerly of Durham, who has several times previously contributed largely to the collection of British Birds' Nests and Eggs, and to the collections of Insects, by presenting his extensive collections of these to the Society, has again generously presented an almost complete collection of European Butterflies, chiefly collected and mounted by himself during his residence in the South of France. This collection includes nearly 300 species and varieties of European Lepidoptera, many of them very rare, from the Alpine districts of France and Corsica, mounted and arranged in convenient glass-topped boxes by his own hand and with the locality and date attached to each specimen. With these also was presented a large collection of Flies (Diptera) from the same parts of Europe and several other interesting Insects. These most valuable collections will, it is expected, be soon arranged in suitable cabinets, where they will form an authoritative collections for reference to local Entomologists and others interested in this beautiful group of animals.

A small collection of African Lepidoptera has also been presented by C. E. Bell, Esq., from Mandala, Nyassaland, in British Central Africa. Other departments of the collection have also been added to.

During the year the Bird Collection has been gradually increased by interesting specimens presented by George E. Crawhall, Esq.; Alfred Allhusen, Esq., of Beadnell Tower; Mr. Thomas Thompson; Mr. John Duncan, and others, who have sent many desirable additions to the local collection of Birds.

A small series of Land Shells from Natal, containing some interesting additions to the Molluscan Collection, and a collection of Marine Shells from the South and South-east Coast of South Africa were presented and sent by Henry E. Burnup, Esq., of Pietermaritzburg, Natal; and J. Dacosta, Esq., has given to the Society a few interesting Shells from Lake Tanganyika and others from tropical South America.

The Rev. John E. Hull contributed a collection of eighty-one species of British Spiders, which will form a good nucleus for a more extensive collection of this interesting but rather neglected and despised group of animals, whose often beautiful forms are almost unknown, and whose utility in the economy of nature is almost unrecognised and uncared for. It is therefore with some pleasure we acknowledge this small collection, the more so as it is accompanied with a careful Catalogue of this group of animals, which has just been contributed to the Natural History Transactions by the Rev. Gentleman named above, and has recently been published in Vol. XIII., part 1.

A most important, extensive, and carefully-named Herbarium of British Plants, formed and named by the Rev. H. E. Fox, of Durham, has lately been presented by that gentleman on the occasion of his leaving Durham to reside in the South of England. It contains also a large number of European Plants and forms a valuable addition to the present Herbarium of the Society, with which it will be incorporated. It will not be irrelevant to mention that the generous donor of this collection is a relative of the late George Townsend Fox, Esq., of Westoe, who in 1827 compiled and edited a "Synopsis of the Newcastle Museum" a short time before the Natural History Society was formed, and before the contents of the Allan Museum were handed over to the custodianship of the newly-formed Natural History Society in 1829.

Very few donations have been received for the Ethnological Collections, but an important collection of Ancient Pottery discovered in Egypt in 1894, by Prof. W. Flinders Petrie, has been obligingly presented by that gentleman. This collection consists of fifty-six examples of carefully-made Jars, urn-shaped, and

other vessels supposed to belong to a race which invaded Egypt 3,000 years B.C., and of which no authenticated account has yet been published.

The Geological Collection has been increased by a small collection of Fossil Plants and Shells, forming part of a collection made on the Yorkshire Coast by the late T. L. Gooch, Esq., late of Gateshead, and presented by R. R. Redmayne, Esq.

Through the exertions of L. W. Adamson, Esq., a picture of "John Hancock at Work in his Studio," painted by the late H. H. Emmerson, was purchased by a number of subscribers who, under the suggestion of Mr. Adamson, offered the picture to the Society. This picture was formally presented to the Committee in the Hancock Room of the Museum by the Chairman of Subscribers, Mr. L. W. Adamson, and accepted on behalf of the Committee by Dr. Embleton in March last. This picture is now exhibited in the East Corridor of the Museum.

A series of interesting Photos, illustrating the remarkable Geological Sections of some parts of the Coast of Ireland, were presented to the Museum by Mr. H. Bolton, of the Owen's College Museum, during the visit of the Museum's Association to Newcastle in 1895.

The Library has been increased by about 150 parts and vols. of Transactions, received chiefly in exchange with other Societies.

A full list of all the donations presented during the year will be appended to this Report.

The following ladies and gentlemen have been elected members of the Society during the year 1895-96:—

Harry Benson, Denehurst, Jesmond Park, East.

Joseph Cook, North Biddick Hall, Washington, County Durham.

Bryan Cookson, Oakwood, Wylam-on-Tyne.

Harold Cookson, " "

Mrs. Isabella Lilley Cowen, Blaydon Burn House, Blaydon-on-Tyne.

Robert Brown, 5, St. Thomas Place, Newcastle.

E. C. Craster, Beadnell Hall, Chathill, Northumberland.

Chas. Wm. Metcalfe Dale, 12, Lovaine Place, Newcastle.

Axel F. Ericsson, Mayfield, Jesmond, Newcastle.
J. C. J. Fenwick, M.D., Longframlington, Morpeth.
George Fleming, South Bank, Jesmond, Newcastle.
John Hancock, Eldon Street, Newcastle.
George P. Hughes, Esq., J.P., Middleton Hall, Wooler.
Alex. Laing, 12, Sydenham Terrace, Newcastle.
Thomas Lawson, 1, St. Mary's Terrace, Newcastle.
T. W. McDowall, M.D., Northumberland County Asylum,
Morpeth.
George William McLean, 3, Jesmond Villas, Newcastle.
Mrs. Newall, Ferndene, Gateshead-on-Tyne.
F. S. Newall, Birtley Hall, Chester-le-Street.
John E. McPherson, Bellenden House, Newcastle.
F. J. Snowball, Esq., Seaton Burn House, Northumberland.
L. Sowerby, Chollerton House, Wall-on-Tyne.
Thomas Spencer, The Grove, Ryton-on-Tyne.
James E. Woods, Low Gosforth House.

HON. MEMBER.

Rev. Henry E. Fox, M.A., London.

WITH THE NATURAL HISTORY SOCIETY.

1895, TO 30TH JUNE, 1896.

Cr.

1895.	PAYMENTS.	£	s.	d.	£	s.	d.
June 30.	By Salaries and Wages:—						
	Richard Howse	200	0	0			
	Joseph Wright	100	0	0			
	Wm. Vout	67	12	0			
	Albert Spencer	54	12	0			
	Mrs. Atkinson	26	0	0			
					448	4	0
	„ Incidental Expenses:—						
	Coal	6	13	0			
	Coke	27	4	4			
	Gas	5	10	11			
	Water	4	17	2			
	Electric Lighting	11	13	2			
	Advertisements	2	6	6			
	Income and Land Taxes	6	17	2			
	Insurances	23	3	0			
					88	5	3
	„ Tradesmen's Accounts:—						
	Robson & Sons	1	5	0			
	Dinning & Cooke	17	4	8			
	Gurney & Jackson	1	17	0			
	G. G. Laidler	50	0	0			
	Walker & Son	1	18	9			
	John Bell & Co.	1	13	3			
	Middlemas Bros.	2	4	5			
	Beck & Son	1	12	6			
	Adw. Reid & Co.	0	11	0			
	J. Jackson	24	12	6			
					102	19	7
	„ Sundries:—						
	Joseph Wright	1	0	6			
	Packing Butterflies	19	3	10			
	Carriage Do.	5	6	6			
	Museums Assoc. Subscriptions ...	1	1	0			
	Bird's Skin and Egg, Tinamou ...	1	0	0			
	Cheque Book	0	10	0			
					31	14	10
	„ Balance in Bank				120	9	7
					£791	13	3

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct.

SAM. GRAHAM,	}	AUDITORS.
E. O. REID,		

THE HONORARY TREASURER IN ACCOUNT

Dr.

CAPITAL ACCOUNT,

1896.		£	s.	d.
June 30.	To Invested in Newcastle Corporation Irredeemable Stock at $3\frac{1}{2}$ per cent., as per last Capital Account	2000	0	0
„	Invested in River Wear Commission Funded Debt at $4\frac{1}{2}$ per cent., as per last Capital Account.....	500	0	0
„	Invested in Tyne Commissioners Consolidated Fund at 4 per cent., as per last Capital Account.....	2000	0	0
		<u>£4500</u>	<u>0</u>	<u>0</u>

FITTING ACCOUNT,

1895.		£	s.	d.
June 30.	To Balance ..	242	13	6
Nov. 20.	„ Cheque from Lord Armstrong	500	0	0
Dec. 31.	„ Interest on Account	1	15	6

£744 9 0

WITH THE NATURAL HISTORY SOCIETY.

30TH JUNE, 1896.

CR.

1896.	£	s.	d.
June 30. By Newcastle Corporation Irredeemable Stock at 3½ per cent., as per Certificate No. 260	2000	0	0
„ River Wear Commission Funded Debt, No. 967, at 4½ per cent.	500	0	0
„ Tyne Commissioners Consolidated Fund at 4 per cent., Mortgage No. 5948	2000	0	0
	<hr/> £4500 0 0 <hr/>		

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct.

SAM. GRAHAM,	} AUDITORS.
E. O. REID,	

30TH JUNE, 1896.

1895.	£	s.	d.
Aug. 15. By Cash, Sopwith & Co.....	70	0	0
„ 15. „ do. G. G. Laidler	19	10	0
Nov. 14. „ do. Sopwith & Co.	24	7	4
Dec. 12. „ do. Dinning & Cooke, on Account	180	0	0
1896.			
Feb. 13. „ do. Hewitson	2	18	7
„ 13. „ do. Dinning & Cooke	119	13	11
„ 14. „ do. Middlemas Bros.	215	19	7
„ 15. „ do. Heron	2	19	1
„ Balance as per Bank Book	109	0	6
	<hr/> £698 0 9 <hr/>		

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct, 29th August, 1895.

SAM. GRAHAM,	} AUDITORS.
E. O. REID,	

OFFICERS OF THE NATURAL HISTORY SOCIETY, 1896-97.

The following Gentlemen were elected as Officers of the Society for
1896-97, viz. :—

PRESIDENT.

Lord Armstrong, C.B., F.R.S.

VICE-PRESIDENTS.

The Earl of Ravensworth.	W. A. Watson-Armstrong, Esq.
Sir Lowthian Bell, Bart., F.R.S.	W. D. Cruddas, Esq., M.P.
Sir Andrew Noble, K.C.B., F.R.S.	E. J. J. Browell, Esq.
Sir M. W. Ridley, Bart., M.P.	Prof. G. S. Brady, M.D., F.R.S.
The Mayor of Newcastle.	I. G. Dickinson, Esq.
R. R. Dees, Esq.	John A. Woods, Esq.
D. Embleton, Esq., M.D.	G. H. Philipson, Esq., M.D.
D. O. Drewett, Esq.	John Daglish, Esq.
Joseph W. Swan, Esq.	Rev. Canon Norman, F.R.S.
H. N. Middleton, Esq.	George E. Crawhall, Esq.
Alex. S. Stevenson, Esq.	Rev. Principal Gurney, D.C.L.

HON. TREASURER.

Thomas Thompson, Esq.

HON. SECRETARIES.

A. H. Dickinson.		Prof. M. C. Potter.
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COMMITTEE.

H. T. Archer.	John Pattinson.
R. C. Clephan.	John Philipson.
Samuel Graham.	W. M. Pybus.
R. Y. Green.	J. F. Spence.
Prof. G. R. Murray, M.D.	Bryan Cookson.
N. H. Martin.	Alexander Meek.

AUDITORS.

E. O. Reid.		Samuel Graham.
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HONORARY CURATORS,

1896-97.

ZOOLOGY.

VERTEBRATA.

D. Embleton, M.D.
Samuel Graham.Thomas Thompson.
Alexander Meek.

INVERTEBRATA.

Rev. Canon Norman.
N. H. Martin.Alexander Meek.
Prof. Wm. Somerville.

BOTANY.

Rev. H. E. Fox, London.
Rev. Wm. Johnson.Prof. M. C. Potter.
C. E. Stuart.

GEOLOGY.

E. J. J. Browell.
J. Daglish.
E. J. Garwood.J. W. Kirkby.
Prof. G. A. Lebour.
Jno. Pattinson.

CURATOR.

Richard Howse.

KEEPER OF THE MUSEUM.

Joseph Wright.

LIST OF EXCHANGES AND DONATIONS TO THE MUSEUM
AND LIBRARY

OF

THE NATURAL HISTORY SOCIETY,

FROM JULY 1ST, 1895, TO JUNE 30TH, 1896.

AMERICAN SOCIETIES.

UNITED STATES OF AMERICA.

Albany :—*New York State Library and Museum.*

Regent's Report, 47, for 1893.

Boston :—*Society of Natural History.*

Proceedings, Vol. 26, Part 4. Nov., 1894—May, 1895.

„ Vol. 27, pp. 7-14.

Memoirs, Vol. V., Nos. 1, 2, 1895.

Boston :—*American Academy of Arts and Sciences.*

Proceedings, New Ser., 22.

The Academy.

Cambridge :—*Museum of Comparative Zoology, Harvard College.*

Memoirs, Vol. 18, No. 15.

„ „ 19, No. 1.

Bulletin, Geol. Ser., Vol. 28, No. 1.

Bulletin, Vol. 27, Nos. 2, 3, 4, 5, 6, 7.

„ „ 29, Nos. 1, 3.

Annual Report of the Curator. 1894-95.

Prof. Alex. Agassiz.

Chicago ;—*Academy of Sciences.*

Bulletin, Vol. 2, No. 11.

38th Annual Report for 1895.

The Academy.

Meriden, Conn. :—*Scientific Association.*

Transactions, Vol. VII., 1895.

The Museum.

New York :—*Academy of Science and Lyceum of Nat. History.*

Transactions, Vol. XIV.

Annals, Vol. 8, Nos. 6-12. 1895.

Memoirs, Vol. 1, Part 1.

The Academy.

Philadelphia :—*Academy of Natural Sciences.*

Proceedings, Parts 1, 2, 3. 1895.

The Academy.

Philadelphia :—American Philosophical Society.

Proceedings, Vol. 33, No. 147. Jan., 1895.

„ „ 34, „ 148.

„ „ 34, „ 149.

Transactions, Vol. 18, Part 2, New Ser.

The Society.

Philadelphia :—Wagner Free Library.

Transactions, Vol. III., Part 3. March, 1895.

The Director.

Rochester, N.Y. :—Academy of Science.

Proceedings, Vol. 2, Brochure 3, 4. 1894-5.

The Academy.

Salem :—American Association for Advancement of Science.

Proceedings, 43rd Meeting, Brooklyn, N.Y. 1894. *The Association.*

St. Louis :—Academy of Science.

Transactions, Vol. VI., No. 18.

„ „ VII., Nos. 1, 2, 3.

The Academy.

Washington :—Smithsonian Institution : Bureau of Ethnology.

3 Bulletins, viz. :—

Archæological Investigations in James and Potomac Valleys.

Sionan Tribes of the East.

Chinook Texts.

Washington :—Smithsonian Institution: Contributions to Knowledge.

An Account of the Origin and History of the Smithsonian Institution.

Miscellaneous Collections :—

971. Index of Cerium and Lanthanum.

972. „ „ Didymium.

980. On the Densities of Oxygen and Hydrogen.

989. Composition of Expired Air.

The Institution.

Washington :—Smithsonian Institution, U.S. National Museum.

Report of U.S. National Museum. 1893.

Proceedings, U.S.N.M., Vol. 17. 1894.

Bulletins, No. 48.

The Institution.

Washington :—United States Geological Survey.

14th Annual Report, Part 1. Geology.

„ „ „ 2. Accompanying Papers.

Monographs, XXIII., XXIV.

Bulletins, 118-122.

The Director of U.S. Geol. Survey.

Washington :—Department of Agriculture.

Bulletin, No. 6. The Common Crow.

„ „ 8. The Jack Rabbits.

The U.S. Department of Agriculture.

SOUTH AMERICAN STATES.

Uruguay, Monte Video :—Museo Nacional.

Anales, Part 4. 1896.

The Director.

BRITISH SOCIETIES.

Berwick-upon-Tweed :—Berwickshire Naturalists' Club.

Vol. 15, Part 1. 1896. Index to Vol. 14.

*The Club.**Cambridge University :—Philosophical Society.*

Proceedings, Vol. VIII., Part 5; Vol. IX., Part 1, 2.

*The Society.**Cardiff :—Naturalists' Society.*

Report and Transactions, Vol. 27, Part 1.

*The Society.**Dublin :—Royal Society.*

Transactions, Vol. V., Parts 5-12; Vol. VI., Part 1.

Proceedings, Vol. VIII., Parts 3, 4.

Edinburgh :—Geological Society.

Transactions, Vol. VII., Part 2.

Edinburgh :—Scottish Meteorological Society.

Journal, 3rd Ser., Nos. XI., XII., for 1893-94.

*The Society.**Glasgow :—Natural History Society.*

Transactions, New Ser., Vol. IV., Part 1. 1892-94.

*The Society.**Greenwich :—Royal Observatory.*

Magnetical and Meteorological Observations, 1892.

Reductions, Part 3. Temperature of the Air, 1841-1890.

*The Astronomer Royal.**Leeds :—Yorkshire Naturalists' Union.*

Transactions, Part 19. Yks. Carb. Flora.

*The Society.**Liverpool :—Literary and Philosophical Society.*

Proceedings, Vols. 44-49, for 1890-95.

*The Society.**London :—British Museum, Cromwell Road, Kensington.*

Catalogue of Fishes, Vol. 1, 2nd ed.

Catalogue of Burmese Spiders.

Guide to the British Mycetozoa. A Lister.

An Introduction to the Study of Rocks. L. Fletcher.

Fossil Plants of the Wealden, Part 2. A. C. Seward.

Catalogue of Birds, Vol. 25. *Gaviæ and Tubinares.*" " 27. *Chenomorphæ, Crypturi, Ratitæ.*" of Fossil Fishes, Vol. 3 *The Trustees of British Museum,*

London :—Nature.

From June 30th, 1895—June 30th, 1896.

*The Publisher.**London :—Quekett Microscopical Club.*

Journal, 2nd Ser., Vol. 6, Nos. 37, 38. April, 1896.

*The Club.**London.*

Rhopalocera Exotica, Parts 33, 34, 35, 36, 37.

*Purchased.**London :—Zoological Society.*

Proceedings, Parts 2, 3, 4. 1895. Part 1. 1896.

Transactions, Vol. 13, Part 11; Vol. 14, Part 1.

*The Society.**Manchester :—Literary and Philosophical Society.*

Memoirs and Proceedings, 4th Ser., Vol. 9, Nos. 3, 4, 5, 6.

" " " " 10, " 1, 2, 3. *The Society.**Newcastle-on-Tyne :—Institute of Mining & Mechanical Engineers.*

Transactions, Vol. 44, Part 4, 5, and Appendix.

" " 45, Parts 1, 2, 3.

Report of the Flameless Explosive Committee, Parts 2, 3.

*The Institute.**Northampton :—Northamptonshire Nat. Hist. Soc. and Field Club.*

Nos. 61–64 and Index for 1895.

*The Society.**Sildon, Co. Durham.**Harbarium of Lichen-Flora of North of England* by Rev. W. Johnson.

Fasciculi V., VI.

*Purchased.**York :—Yorkshire Philosophical Society.*

Annual Report for 1895.

The Society.

COLONIAL SOCIETIES.

AUSTRALIA.

Sydney, N.S.W. :—Royal Society.

Journal and Proceedings, Vol. XXVIII. 1894.

*The Society.**Sydney, N.S.W. :—Australian Museum.*

Report of Trustees for 1894.

Records, Vol. II., Nos. 6, 7.

The Trustees.

CANADA.

Halifax, Nova Scotia :—The N.S. Institute of Natural Science.

Proceedings and Transactions, Vol. 1, Part 4, 2nd Ser. 1895.

The Society.

Montreal:—Natural History Society.

Canadian Record of Science, Vol. 6, Nos. 3, 4, 5, 6, 7, 8.

*The Natural History Society, Montreal.**Ottawa, Canada:—Geological Survey of Canada.*

Annual Report, New Ser., Vol. VI. 1892-3.

Palaeozoic Fossils, Vol. III., Part 2.

Maps. Sheet No. 11, S.W. *Nova Scotia*.E. Townships Map (*Quebec*). N.E. $\frac{1}{4}$ sheet.Rainy River Sheet (*Ontario*).Sheets 25-No. 38, incl. *Nova Scotia*.

Maps 364-372 incl. Auriferous Creeks, Cariboo Mining District. British Colombia.

Contributions to Canadian Palæontology. Vol. 2, Part 1. (*Fossil Insects*).
Dr. G. M. Dawson, Director.

EUROPEAN SOCIETIES.

BELGIUM.

Brussels:—Société Royale Malacologique.

Annales, tome XXVII. 1892.

Procès-verbal. Nov., 1892—May, 1895.

The Society.

FRANCE.

Paris:—Museum d'Histoire Naturelle.

Bulletin Nos. 4, 5, 6, 7, 8. 1895; No. 1. 1896.

AUSTRIA.

Prague:—Archiv. der Naturwissenschaft Landesdurchforschung von Böhmens.

Band 9, Nos. 3, 6; Band 10, No. 1. Geol. Karte.

*The Society.**Trencsin:—Natural History Society.*

Yahresheft. 1894-95.

*The Society.**Vienna:—Verhandlungen der K. K. Zool-Botan. Gesellschaft in Wein.*

Jahrgang, 1895, Band XLV., Heft 6, 7, 8, 9, 10; Vol. XLVI., Heft 1, 2, 3, 4, 5.

The Society.

DENMARK.

Copenhagen:—Videnskabelige fra Naturhistoriske Forening i Kjøbenhavn.

Videnskab for Aarat, 1895.

The Society.

GERMANY.

Saxony, Dresden :—Der Isis.

Abhandlungen, July-Dec., 1894; Jan.-June, 1895.

The Society.

NORWAY.

Christiania :—Videnskabs-selskabet, etc.

Forhandlingar, Aar. 1894.

Oversigt, Parts 1-11, for 1894.

Skrifter, 11 parts, 1894.

The Society.

RUSSIA.

Kieff :—Natural History Society.

Transactions, tome XIII., Parts 1, 2.

,, ,, XIV., Part 1.

The Society.

SWEDEN.

Stockholm :—Kongliga Svenska Vetenskaps-Akademiens.

Handlingar (Memoirs), Bandet 26, 27.

Bihang (Supplement), Bandet 20, No. 1-4. 1895.

Ofersigt (Bulletin), Nos. 51-52. 1894-95.

Om Sveriges zoologiska hafstation Kristineberg.

The Academy.

MISCELLANEA.

Photos of Irish Scenery.

H. Bolton, Esq., Manchester.

Calendar for Session 1895-96.

*Rutherford College, Ruth Lane.*Morphology and Classification of Panropoda, etc. Tufts' College Studies,
No. 4

Report and Proceedings of Museums Association, Newcastle, 1895.

Catalogue of British Animals (Radiata) in British Museum. *Purchased.*Catalogue of Plants, Easter Duddington Lodge, 1894. *Faraday Spence.*

Horn Measurements and Weights of the Great Game of the World.

Rowland Ward, F.Z.S.

ZOOLOGY.

MAMMALS.

Young Porpoise, *Phocaena communis*, from North Sea, Northumberland coast.*Messrs. Phillips, Barras Bridge.*Head of Fallow Deer, *Cervus dama*, L.*Mr. J. Stephenson.*Two specimens of Water Vole, *Arvicola amphibius*, L., from an Island in
the Humber, infested with them.*Rev. J. H. Fowler, D.C.L., etc., Durham.*

Stoat from Ruby Mines Farm, Greenside, Ryton.

Seymour Bell, Esq., Eldon Square.

Skeleton of Rabbit taken out of a wall, Comyn's House, Quayside, Newcastle

Mr. John Jackson, York Street, Newcastle.

Weasel killed at Whitley Quarries.

Mr. John Duncan.

BIRDS.

Young Sandpiper, *Actitis hypoleucos*, Woolsington Lake. June, 1895.

Mr. John Jackson.

A few Birds' Eggs from South Africa and Clutch of Black-headed Gull's Eggs from Whitsun Moor, Wooler.

Mr. W. H. Dodds, South Africa and Newcastle.

Goatsucker, *Caprimulgus Europæus*, near Ross, Herefordshire. 30, 7, 1895.

Fred. V. Wallis, Cloughton House, near Ross.

Undulated, Green Parroquet, *Melopsittacus undulatus* (cage-bird).

D. Embleton, Esq., M.D.

Dunlin, first plumage, killed at Marsden, 8th August, 1895.

George F. Bell, Newcastle.

Eggs of a Green Parrot? (cage-bird).

Mr. Thomas Sinclair, Byker.

Cormorant, *Phalacrocorax carbo*, L., Newton-by-the-Sea. Sept., 1895.

Lapwing and Starling, near Cullercoats. Sept., 1895.

Mr. John Duncan, Monkseaton.

Eight Bird Skins from Basutoland, South Africa.

Mr. W. H. Dodds, S. Africa.

Two crops of young Red Grouse containing leaves of *Calluna* (Heather); one with a few Insects. *Hy. Stobart, Esq., per Geo. E. Crawhall, Esq.*

Two examples of Richardson's Skua, shot at St. Mary's Island (one light plumage, the other dark). Sept. 24th, 1895.

Mr. M. H. Dawson, Newcastle.

Arctic Tern (changing to winter dress), St. Mary's Island. Oct. 2, 1895.

Little Gull, *Larus minutus*, immature, St. Mary's Island. Oct. 1, 1895.

Wigeon ♂ immature, Seaton Sluice.

Grey Plover, immature, Seaton Sluice. Oct. 12, 1895.

Purple Sandpiper, *Tringa maritima*, St. Mary's Island. Sept., 1895.

John Duncan.

Richardson's Skua (in the down), Orkney. July, 1895.

Major Ernest Anne.

Long-eared Owl (skin) shot in Scotland. 1895.

Mr. Arthur F. Davis, London.

Weaver Bird (cage specimen).

Mrs. Ward, Osborne Avenue.

Hoopoe, *Upupa epops*, found dead in the garden at Beadnell Tower, Northumberland. Oct. 26, 1895. *Alfred Allhusen, Esq., Beadnell Tower.*

- Herring Gull, *Larus argentatus*, ♂, St. Mary's Island. Nov., 1895.
 Ringed Guillemot, *Uria troile* var. *ringvia*, Whitley Sands. Nov., 1895.
 Water Rail, *Rallus aquaticus*, Tynemouth. Nov. 12, 1895. John Duncan.
 Geosander ♂ in the Moul, Rothbury. Oct., 1895.

W. H. Walker, Jarrow.

- Female Pheasant, assuming the male plumage, shot at Featherstone Castle.
 Oct., 1895. Hope Wallace, Esq., per Major E. Anne.

- Greater Black-backed Gull, ♂, *Larus marinus*, immature, Fenham Slake,
 Nov., 1895.

- Common Scoter, ♀, *Oidemia nigra*, St. Mary's Island. Nov. 1895.

- Long-tailed Duck, *Harelda glacialis*, ♂, juv, St. Mary's Island. Nov., 1895.

John Duncan.

- Skin of Tinamon, *Tinamotis Bonapartii*, and an Egg of Tinamou from Bogotá,
 South America.

Purchased.

- An albino variety of Java Finch.

Mr. Alfred Hume.

- Fulmar, *Fulmarus glacialis* (L.), shot at the mouth of the Tyne. Oct., 1895.

In Exchange per Mr. John Duncan.

- Starling var. (kept three years in a cage) at Monkseaton. Dec., 1895.

Mr. John Duncan.

- Two Eiders, ♂ and ♀, winter dress, mature. Jan., 1896.

J. F. Blackett, Esq., Newcastle.

- Scap Duck, ♂, *Fuliga marila*, near Haydon Bridge. Jan. 25, 1896.

- Teal, ♂, mature, Haydon Bridge. Jan., 1896. Geo. F. Crawhall, Esq.

- Complete Nest of Magpie, *Pica caudata*, built in the centre of a bunch of
 Mistletoe on the branch of an Apple-tree, at Kingsland, Herefordshire,
 taken by Mr. H. T. Williams, on the 11th May, 1895.

Wm. Mark Pybus, Esq.

- Redwing, *Turdus Iliacus*, L., caught during the severe winter, Jan., 1895,
 and has lived in confinement to the present time, 1896, when it was
 killed by rats.

- Head of Rook with malformed, long upper mandible, shot at Alnmouth,
 April, 1892, in good condition.

- Lesser Black-backed Gull, ♀, with the Ova well developed; six larger
 than the others and size of peas. April, 1895.

- Razor Bill, *Alca torda*, ♂, caught in a Salmon Net at St. Mary's Island.

- Cardinal Grosbeak, *Cardinalis Virginianus* (cage-bird).

- Hawfinch, young, killed against Greenhouse at Styford Gardens, Riding
 Mill-on-Tyne. June, 1896.

- Peewit, young, Cullercoats. July, 1896.

John Duncan.

- Grey Phalarope, *Phalaropus fulicarius* (L.) ♀ ? in summer plumage (stuffed
 bird, locality unknown).

James Pool, Heaton.

Snipes' Nest with four Eggs, from a bog at Ruby Mines Farm near Green-side, Ryton-on-Tyne. *Seymour Bell, Esq.*

REPTILES AND FISHES.

Rounded mass of Roe or Eggs of a Wolf-fish from a Shields Trawler. Dec., 1895. *Messrs Phillips, Barras Bridge.*

Three Gurnards, *Tripla sp. indet.*, from Trawlers. *Richard Howse.*

Head of Wolf-fish, Trawlers, North Shields. *Messrs. Phillips, Newcastle.*

Skull of Shark, *sp. ignot.*, brought up in a Trawl-net off the Tyne.

North Shields.

A Torpedo Ray, *Torpedo hebetans?* caught in a Trawl-net off Sunderland.

June 18, 1896. *Mr. J. V. Henderson, Clayton Street, Newcastle.*

Variety of the Common Haddock (*very pale yellow skin, spot indistinct*).

Mr. Wm. Cummings, Gateshead.

Portion of Skull of Trigger-fish (*Siluroid fish*) from Barbadoes.

Mrs. H. B. Watson, Millfield House.

Three-bearded Rockling, caught on a line at the end of South Pier, South Shields. May 4, 1896. *Dr. Drummond, South Shields.*

Jaw of Shark, caught on Coast of Florida, U.S., America.

Capt. Gilbert Howse, Cullercoats.

Specimen of Hagfish or Sucker, with three Eggs, found inside a Codfish, North Shields. May 8, 1896. *Mr. F. H. Phillips.*

MOLLUSCA.

Ten specimens of the following Land and Water Mollusca:—

One *Bulimus (Borus) oblongus*, Müll., Bogotá.

One *Orthaliscus Adamsoni*, Gray, Bogotá.

One *Helix (Isomeria) orcas*, Koch, Cauca, S. of Colombia.

One *Helix (Solaropsis) Gibsoni*, Pfr., Bogotá.

One *Cyclotus angulatus*, Sow., Cauca.

One *Neothauma Tanganyikense*, Smith, Lake Tanganyika, Centr. Africa.

One *Lanistes purpurens*, Jones, Lake Victoria Nyanza.

Two *Limicolaria Martinsiana*, Smith, Lake Tanganyika.

One *Spatha Tanganicensis*, Smith, Lake Tanganyika.

S. J. Da Costa, Esq., London.

Eight species of Marine Land Mollusca from Natal, S. Africa:—

Ianthina fragilis and *I. globosa* and *Ostræa cucullata*.

Bullia sulcata, Recoc; and *Venus verrucosa*.

Achatina granulata, Maritzburg, Natal.

Achatina Burnupi, Sm., Drakenberg, Natal (5,600 feet).

Achatina simplex, Lady-Smith, Natal.

Henry C. Burnup, Esq., Pietermaritzberg, Natal.

INSECTS.

Small collection of *Lepidoptera* from British Central Africa.

C. E. Bell, Mandala, Nyassaland, Cent. Africa.

Large Tick found on a Tortoise.

Mr. John Duncan.

A collection of eighty-five species of British Spiders chiefly from Durham and Northumberland.

Rev. John E. Hull, M.A., North Shields.

A large and valuable collection (290 species and var.) of Butterflies (*Lepidoptera diurna*) and a large collection of Flies (*Diptera*), collected chiefly in the South of France and Corsica by F. Raine, Esq.

Presented by Frederic Raine, Esq., Hyères, Var, France.

BOTANY.

Ectocarpus æcidioides, R., on young fronds of *Laminaria hieroglyphica* at Filey, June, 1895.

E. M. Holmes, Esq., Pharmaceutical Society, London.

Small Branch of *Eucalyptus globulodus*? in fruit, Cape Town, S. Africa.

Mr. R. E. Kay, Manor House Road, Newcastle.

A large collection of British and European Plants, comprising the Herbarium of the Rev. H. E. Fox, of Durham, and a small collection of N. Zealand Plants.

Presented by the Rev. H. E. Fox, M.A., London.

Nut of the Seychelle Palm. *Mrs. Hardcastle, Chester Crescent, Newcastle.*

FOSSILS AND MINERALS.

Productus giganteus, from Little Mill Quarries, Northumberland.

Mr. Geo. Wilson, Rennington.

A few rough *Agates* and piece of *Zeolite* from Basutoland, S. Africa.

W. H. Dodds, Esq., Newcastle and S. Africa.

Small collection of Chalk-Marl Fossils, Rottingdean, near Brighton, and *Trigonias* from Portland Oolite.

John I. Clarke, Gosforth.

Specimen of *Asterophyllites foliosa*, L et H., Charlotte Pit, Benwell.

Mr. W. Buchan.

Specimens of *Mesotype* and *Datholite*? from Giants' Causeway, Antrim.

Mr. T. Dickinson.

A Slab of Mineral deposited from Water in the Ann Pit, Walker Colliery, taken from some backing deals put into the Pit about 1845; removed Sept., 1895.

Mr. Walter Brown.

Piece of *Stigmara* found in the Roman Camp at "Æsica," on the Roman Wall.

Mr. Gibson, Black-Gate Museum.

A piece of cherty, Carboniferous-Limestone.

J. Maling, Esq.

Specimens of Specular Iron from Elba. April 18, 1896.

Capt. Gilbert Howse.

Specimen of *Cyclopteris* from shale above the "Yard-seam," Shiremoor Colliery. *Mr. J. Taylor, Shiremoor.*

A collection of Fossil Plants and Shells from the Yorkshire Coast, made by the late T. L. Gooch, Esq., Low Fell, Gateshead.

R. R. Redmayne, Esq., per Prof. Lebour.

Jaws of Red Deer and of *Sus scrofa* from the silt, bed of the Tyne.

Wm. Page, Esq.

ETHNOLOGY.

Two Cases of Egyptian Pottery (sixty-six examples) belonging to a Race which invaded Egypt 3,000 B.C., discovered by Prof. W. Flinders Petrie in 1894. *Prof. W. Flinders Petrie.*

Two Indian Arrow-Heads from U.S., America.

Newby S. Green, Esq., per R. Y. Green, Esq.

Two Limestone Moulds for Casts (? Egyptian).

Mrs. Hardcastle, Chester Crescent.

Walking Stick "Kerry" from Basutoland.

W. H. Dodds, S. Africa and Newcastle.

MISCELLANEOUS.

A large Case for the Lion killed in Sanger's Menagerie.

A friend, per R. Y. Green, Esq.

XII.—*On the British Species of Entomostraca belonging to Daphnia and other allied genera.* By GEORGE STEWARDSON BRADY, M.D., LL.D., F.R.S. (Plates VII.—X.)

SINCE the publication of Dr. Baird's classical work on the British Entomostraca in 1850 nothing has appeared in print respecting the British species of *Daphniæ* except casual and fragmentary notices, and even of these not very many. Dr. Baird himself published in the "Edinburgh New Philosophical Journal" an article on the Food of freshwater Fishes, in which a new species of *Daphnia* was described. Mr. D. J. Scourfield has contributed some interesting papers to the "Journal of the Quekett Microscopical Club" and the "Journal of the Linnean Society," which deal partly with *Daphniæ*; Mr. Thomas Scott has noticed certain species in the Annual Reports of the Fishery Board for Scotland; Dr. Creighton has published a list of Irish species in the "Irish Naturalist," and Mr. T. V. Hodgson a list of the British Cladocera in the "Journal of the Birmingham Natural History and Philosophical Society." Dealing with matters of embryology and physiology rather than morphology, Messrs. Hardy and McDougall have published in the "Proceedings of the Cambridge Philosophical Society" a paper on the "Structure and functions of the alimentary canal of *Daphnia*," and Sir John Lubbock in the "Philosophical Transactions" one on "Two methods of reproduction in *Daphnia* and on the structure of the Ephippium." This very small list embraces, so far as I know, all the existing literature of the British *Daphniæ*, excepting only short papers in popular serials. Much, however, has been published on the Continent. Among the more important memoirs are those of Professor G. O. Sars, which, as to European species, are unfortunately devoid of illustrations. Equally valuable are the various monographs of Schoedler, Daday de Dees, Hellich, Richard, Eylmann, Stingelin, and others, while the older and more elaborate monograph of Leydig—"Naturgeschichte der Daphniden"—is in itself a storehouse of information on the morphology and physiology of the group. From across the Atlantic

we have Herrick's work on the "Entomostraca of Minnesota," embracing not only *Daphniæ* but all other groups of fresh-water species, and various shorter memoirs by other American observers.

The *Daphniæ* are not only a very attractive and interesting, but from the point of view of the systematic zoologist, a very perplexing group. Whatever series of animals or plants one may take up for detailed study, he very soon finds numerous intermediate and apparently incomprehensible forms which, if the generally received ideas of evolution have a sufficient foundation in fact, must be the inevitable outcome of natural processes. Nowhere, perhaps, is this more plainly visible than among the *Daphniæ*, and from this fact it arises that the number of species, so-called, which have been "made in Germany" and other places is so perplexingly great. Many of these species would, doubtless, tried by all morphological and physiological tests, prove untenable, but there will always be differences of opinion as to the values properly assignable to small structural peculiarities. The form of the head in various lacustrine *Daphniæ* affords a crucial example of this. The vertex in these animals varies very much in its development, some being broadly rounded and others drawn out more or less extensively into a conical peak, which may take on a fool's-cap or helmet shape. Upon the extent and character of this development many species have been founded, but inasmuch as connecting links between them may usually be found plentifully, it follows that specific distinctions based only, or even chiefly, on this character can scarcely be admitted as valid.

It is more than probable that a closer study of the *Daphniæ* of the British Lakes would in many cases reveal local differences sufficient distinctly to characterize the inhabitants of particular localities,—differences such as have been described by Sir Walter Buller in the case of the lizard (*Sphenodon*) inhabiting various islands adjoining the New Zealand coasts. Sir Walter says respecting this lizard, "It has become extinct on the mainland; and it is a very curious fact that, through long isolation it has become differentiated in colour in the several islands or groups

of islets which it inhabits. With the exception of a green form, exhibiting some structural modifications which I have dedicated to our great herpetologist, under the name of *Sphenodon Güntheri*, it has been found impossible to distinguish these forms except as local varieties, sufficiently well marked, however, to admit of their being referred to their respective island habitats. What are these, I would ask, but incipient species? Allowing sufficient time under the existing conditions of life, and reasoning by analogy, each island or group of islets must in the end possess a distinct species of *Sphenodon* exactly suited to its environment."*

Mr. Gulick, in his study of the shells of the Sandwich Islands, has found many well-marked local varieties, the result apparently of a prolonged isolation. And in the case of very variable species such as the common whelk, it would doubtless be possible for an expert to determine with tolerable accuracy the localities in which the more pronounced varieties in any collection had been taken. But though varying to a very remarkable extent, it is as yet impossible to point out definitely the distinctive local characters of lacustrine *Daphniæ*, such as *D. galeata* and *D. longispina*. The subject, however, is well worthy of study and would doubtless yield interesting results.

In not a few cases sexual differences afford a valuable aid to diagnosis, but in very many species the male has not yet been observed, one of the most remarkable facts in the Natural History of the Cladocera being the immense preponderance of females. The experience of every collector teaches him that he constantly finds ponds and ditches swarming with *Daphniæ*, and yet does not capture a single male amongst a whole netful of females. The prevalent method of reproduction is, indeed, not sexual at all but parthenogenetic, the female producing and detaching in rapid succession broods of young which are the result of the development, not of fertilized eggs, but of mere buds or "pseud-ova." The true fertilized eggs, when they occur, are contained in peculiar saddle-shaped cases, which go by the name of

* Illustrations of Darwinism; or the Avifauna of New Zealand, considered in relation to the fundamental Law of Descent with Modification, by Sir Walter L. Buller, K.C.M.G., D.Sc., F.R.S., &c. (Transactions of the New Zealand Institute, vol. XXVII., 1894).

"ephippia," and are usually set free late in the year by the death of the parent, remaining in the water over the winter and hatching out on the advent of light and warmth in the spring. The males, therefore, are not always available as helps in the determination of species, and even when they are to be found, it does not seem certain that the characters relied upon by some authors are always quite trustworthy.

The synonymy of the *Daphnia* is, as might be expected, very perplexing, and I have scarcely attempted to give more references than are necessary for identification: many species have been proposed which have ultimately been withdrawn by the authors themselves as being of no more than varietal value. But in a group where there exist between the recognized species so many intermediate forms, it becomes a matter of convenience and almost of necessity to admit specific and even generic names, which sometimes rest upon very small differences of structure. Such, for instance, is the genus *Hyalodaphnia*, which differs from *Daphnia* only in the absence of an "eye-spot"—a structure possibly of not very much importance, and of which we do not know the physiological significance.

I have received much valuable help from many friends in the preparation of this paper, and to the following my thanks are especially due—to Prof. G. O. Sars of Christiania; the Rev. Canon Norman, F.R.S., of Houghton-le-Spring; Mr. Thomas Scott, F.L.S., of the Fishery Board for Scotland; Mr. D. J. Scourfield, F.L.S., of Leytonstone, Essex; Dr. Creighton, of Ballyshannon, Ireland; and to Dr. H. J. Hansen, of the Copenhagen Zoological Museum.

The following list embraces the species and varieties here described or figured:—

Daphnia pulex, De Geer.

„ *obtusa*, Kurz.

„ „ var. *propinqua*, G. O. Sars.

„ *Schoedleri*, G. O. Sars.

„ *hamata*, G. S. B.

„ *longispina*, O. F. Müller.

„ „ var. *nasuta*, G. O. Sars.

- Daphnia longispina*, var. *major*, G. O. Sars.
 „ *lacustris*, G. O. Sars.
 „ „ var. *vicina*, Richard.
 „ *hyalina*, var. *pellucida*, G. O. Sars.
 „ *galeata*, G. O. Sars.
 „ „ var. *obtusifrons*, G. O. Sars.
Hyalodaphnia Jardinii, (Baird).
 „ *Kahlbergensis*, Schoedler.
Dactylura pubescens, G. S. B.
 „ *magna*, (Strauss).
Moina rectirostris (O. F. Müller).

GENUS DAPHNIA, O. F. Müller.

Daphnia pulex, De Geer, (Pl. VII., figs. 1-8).

- Daphnia pulex*, De Geer, Mém. Pour Servir. à l'Hist.
 Ins. 442, t. 27, figs. 1-4 (fide Baird).
 1850. „ „ Baird, Nat. Hist. Brit. Entom., p. 89,
 pl. VI., figs. 1-3, pl. IX., fig. 5.
 1860. „ „ Leydig, Naturgeschichte der Daphni-
 den, p. 117, pl. I., figs. 1-7.
 1861. „ „ G. O. Sars, Om de i Omegnen af Chris-
 tiania forekommende Cladocerer,
 p. 15 (separate copy).
 1871. „ „ Fric, Die Krustenthierc Böhmens, p.
 231, figs. 33a, b.

Female.—Seen from the side (fig. 1) the shell is subovate, somewhat narrowed toward the front and less so towards the posterior extremity, the middle of which is produced into a short stout spine: the height is equal to considerably more than half the entire length. The head is rounded off in front, its inferior margin forming a more or less deeply sinuated curve, which terminates in a slenderly produced, sharp beak: its posterior margin bearing the slight protuberance of the antennule with its sensory setæ. Dorsal margin only slightly arched in the middle, sloping with a gradual curve to the head, but much

more abruptly behind to the short but broad terminal spine; ventral margin strongly convex, its posterior portion usually fringed with minute spines, which are continued round the posterior extremity as far as the base of the terminal spine; the dorsal margin is much less strongly spinous; the two principal abdominal processes united at their bases (fig. 2*a*). The spines of the postabdomen twelve to fifteen in number and increasing only slightly in length from first to last; the terminal unguis has two serratures on its convex margin, while its concave margin is finely ciliated and bears near its base a series of about six principal curved spines (fig. 3), with another much more minute row immediately in front of them. The pseudova are often very numerous, varying from a few to as many as forty. Shell marked throughout with more or less conspicuous quadrangular reticulations. Eye of moderate size, situated near the front and toward the inferior margin of the head; eye-spot about half way between the eye and the posterior margin. Length,* 2-2½ mm. The ehippial female has the ehippial portion of the dorsal margin quite straight and a well-marked hump bounded by distinct notches, intermediate between it and the head; the terminal spine in a line with the dorsum instead of being median as in the pseudovial form.

Male.—Valves (fig. 4) narrower and more elongated than in the female, tapering towards the posterior extremity, which terminates in a moderately long median spine; height equal to half the length; dorsal margin gently arched in front of the middle, thence sloping in a nearly right line toward each extremity, ventral margin moderately arched, slightly sinuated near the middle. Antennule (fig. 5) long, subcylindrical, truncated at the apex, where it bears a few short sensory filaments and one larger hooked seta, which is about half as long as the peduncle. Postabdomen (fig. 7) wide at the base and tapered at the extremity; pre-anal spines about nine, rather longer behind than in front; terminal unguis similar to that of the female. There are two dorsal abdominal processes, one very short, the other about twice as long as the terminal unguis, directed backwards.

* The measurements of length are in all cases exclusive of the spine.

and rather densely pubescent.* The ventral margin of the valves (fig 6) is densely beset from the antennal notch to near the posterior margin with very long, fine hairs, some of which are plumose. Length, 1.6 mm.

This is a very generally distributed species—not only in the British Islands but on the Continent, inhabiting ponds, ditches, and small weedy pools rather than the larger expanses of lakes, where its place seems to be generally occupied by *D. longispina* or other allied forms. It is noted by almost all European authors, and Mr. Herrick styles it the “commonest of *Daphnias*” in the United States. But the specific name *pulex* having been applied to the commonest and first-described species, it is more than probable that other allied forms have been included, especially by the earlier authors, under the one specific name. Even more than in most other *Daphniæ* great allowance must here be made for variation in almost all directions. The amount of reticulation, shape and size of the shell, especially as to the projections of spine and rostrum, are very inconstant even in specimens from the same locality, while in those from different places the variations are, of course, liable to be greatly accentuated.

The drawings here given were made in the case of the female from specimens taken at Shotton (county Durham), those of the male from a pond at Whipscross Road, Essex. These latter were kindly sent to me by Mr. D. J. Scourfield, F.L.S.

Var. *brevispina* (Daday de Dees).

1888. *Daphnia brevispina*, Daday de Dees, Crustacea Cladocera Faunæ Hungaricæ, p. 119, pl. IV., figs. 13–15.

Mr. D. J. Scourfield has sent to me specimens taken in the neighbourhood of Birmingham, which are different in some respects from the ordinary form of *D. pulex*, and I think are the same as those described by Daday de Dees under the specific name *brevispina*. They do not, however, appear to me to require more than a varietal name. The spine is rather longer than that

* The verticillate arrangement of the hairs described by M. Jules Richard I have not been able to make out, except indistinctly in one specimen.

which I look upon as belonging to the typical *D. pulex*, and the principal abdominal processes are short, curved, nearly equal in length, and divergent: the whole animal of a deep brown colour.

***Daphnia obtusa*, Kurz., (Pl. IX., figs. 5-9).**

1874. *Daphnia obtusa*, Kurz., Dodekas neuer Cladoceren nebst einer Kurzen Übersicht der Cladocerenfauna Böhmens, p. 16, pl. 1, figs. 8-9 (separate copy).

Female.—Very like *D. pulex*, but smaller; the posterior spine almost obsolete, being rather a wide, acutely pointed angular prominence than a distinct spine (fig. 5): the lower margin of the head is deeply excavated, the beak small but acutely pointed: the prominence of the antennule very large and pouting: abdomen and post-abdomen (fig. 6) as in *D. pulex*, except that the marginal spines are fewer,—only about eleven in number. Length, 1·8 mm.

Male.—The valves of the male (fig. 7) are scarcely so much tapered at the hinder extremity as in *D. pulex*, and the abdomen (fig. 9) is destitute of the long dorsal process which normally characterizes that species: the marginal spines of the post-abdomen are only about seven in number. Length, ·85 mm.

For specimens which I refer to this species I am indebted to Mr. D. J. Scourfield, by whom they were taken in a pond at Totland Bay, Isle of Wight. I have also found it in a shallow pool on the line of the Roman wall near Garthside, Walton, Cumberland (July, 1897), and in a pond at Burpham, Sussex. Bishopton, county Durham (Rev. Canon Norman).

Professor G. O. Sars has kindly examined some of these specimens and agrees with me in referring them to *D. obtusa*, Kurz, at the same time expressing a doubt whether they are specifically distinct from *D. pulex*. The absence of any long dorsal abdominal process in the male is doubtless a very striking character, though the amount of specific value attributable to it is not by any means certainly ascertained, but if this point be disregarded it will be extremely difficult to maintain a specific distinction between the two species.

Var. *propinqua*. (Fig. A. and Pl. VIII., figs. 21, 22).

1895. *Daphnia propinqua*, G. O. Sars, On some South African Entomostraca raised from dried mud (Videnskabs-Selskabets Skrifter. I. Matematisk-naturv Klasse, 1895, No. 8), p. 9, pl. II., figs. 1-8.

1895. ? *Daphnia Jurinei*, Stingelin, Die Cladoceren der Umgebung von Basel (Rev. Suisse de Zool., T. III.), p. 197, figs. 2, 3.

1897. *Daphnia obtusa*, Kurz, var. *propinqua*; Richard, Revision des Cladocères, Deuxieme partie (Annales des Sciences Naturelles, 8e. Serie. Zool. T. II.), p. 262, pl. XXI., figs. 11, 19; pl. XXII., fig. 6; pl. XXIII., fig. 6.

In general character intermediate between *D. pulex* and *D. obtusa*. The lateral outline in the female is oval, the dorsal margin rather less boldly arcuate than the ventral. Head well

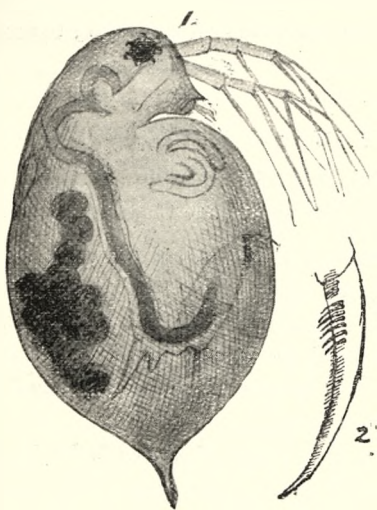


FIG. A.

Daphnia obtusa, Kurz, var. *propinqua*, Sars.

1. Female seen from right side $\times 28$.

2. Unguis of post-abdomen $\times 140$.

rounded in front, slightly concave below, and forming a continuous curve with the dorsal margin above, rostrum very short and sharp; antennular prominence very wide and rounded; spine short and fringed with short spinules, dorsal and ventral margins of the shell smooth or very slightly spinulose behind the middle. Eye large with prominent lenses. Abdomen and post-abdomen as in *D. obtusa*. Shell marked throughout with a decussated reticulation. Length, 2 mm.

I have seen but one male of this form, in the gathering from Bayhall; this has the short abdominal processes characteristic of *D. obtusa*, and appears to be the prevailing form of *Daphnia* in Kent and Sussex. In the spring of 1892 I found it abundantly as follows in ponds at Bayhall, Tunbridge Wells; Arundel and Angmering, Sussex. In the summer of 1897, in a shallow pool by the side of the Irthing at Walton, Cumberland, I took many specimens, all of them immature, which seem to be referable either to *obtusa* or its variety. One of these is figured in plate VIII., figs. 21, 22.

The figures of *Daphnia propinqua* given by Sars differ scarcely at all from the Bayhall specimens. The British form has the valve-margins rather less spinulose and the front of the head seems to be more fully rounded, but otherwise there is no material difference, except perhaps in size. But Sars reared his specimens artificially from dried mud, which may account for a smaller growth—1·8 mm. It may be noted that the figure of the male *Monoculus pulex*, given by Jurine (*Histoire des Monocles*), represents an abdomen with short processes corresponding to those of *D. obtusa*.

***Daphnia Schoedleri*, G. O. Sars. Pl. IX., figs. 1-4.**

1862. *Daphnia Schoedleri*, G. O. Sars, Om de i Omegnen af Christiania forekommende Cladocerer, p. 18.

This species approaches closely *D. pulex*, but the dorsal and ventral margins are much more boldly arched, and the spine is long, slender, and directed slightly upwards towards the dorsum. In all other respects it is like *D. pulex*, and Sars in his latest memoir makes it a variety of that species. Length of the female, 2·1 mm. The male I have not seen.

The only place in which I have found *D. Schoedleri* is Minstead Mill Dam, Hants, where I took it, not very plentifully, in June, 1890.

Prof. G. O. Sars has examined my specimens and considers them to be identical with his *D. Schoedleri*.

Daphnia hamata, n. sp. Pl. VII., figs. 9-17.

1884. ? *Daphnia minnehaha*, Herrick, A final report on the Crustacea of Minnesota included in the orders Cladocera and Copepoda, p. 59, pl. K, figs. 1, 2; pl. L, figs. 1, 2.

Female.—The outline as seen from the side (fig. 9) is subovate, the head well rounded in front, sinuated below, and produced into a wide truncated beak, the lower angle of which is sharp and much exserted. The dorsal margin is only very slightly curved, and its posterior extremity is extended into a long spine which is directed backwards and upwards: ventral margin boldly and evenly rounded; both margins are fringed from a little behind the middle with short spinules. The valves are pellucid, or nearly so, and are entirely covered with a square reticulation. In young specimens (fig. 11) the dorsum is straight, forming at its junction with the head an obtuse angle which bears four short, wide teeth, their points directed forwards (fig. 12). The antennules are small and scarcely distinguishable from the beak except by the presence of sensory setæ. The basal joint of the antennæ in adult or subadult specimens, and to a smaller extent the following joints also, have a scaly appearance owing to the presence of waved lines of minute bead-like hairs (fig. 17). The two principal abdominal processes are distinct, and behind these are two cushion-like prominences—all of them hispid; the marginal spines of the post-abdomen are eleven or twelve in number, short and subequal; terminal unguis rather deeply pigmented, bidentate on the convex margin, and on the concave margin bearing four or five large basal spines and a few bristles (fig. 16). The eye is placed near the middle of the head, and the eye-spot is not more than about one-half its diameter removed from it (fig. 10). Length of adult, 2.53 mm.

Male.—The head is simply rounded (fig. 18), the beak consisting of a minute rounded prominence which bears a single apical hair. The anterior dorsal angle of the shell is toothed almost as in the young of the opposite sex (fig. 13). Antennule short, cylindrical, otherwise as in *D. pulex*. Abdominal processes straight, not setiferous.

I have met with this species only in two gatherings made by

my friend the Rev. Canon Norman at Wallington, Northumberland, and in a pond near the East Gate of Lambton Park, county Durham. The Wallington specimens were the more numerous, but the males were very scarce, and no ovigerous females have been seen. The male antennule, as shown in fig. 13, is probably imperfect. Herrick describes it as having in *D. minnehaha* a long flagellum in addition to the shorter sensory organs.

M. Jules Richard looks upon *D. minnehaha*, Herrick, as being merely a variety of *D. pulex*, but his figure scarcely agrees either with that of Herrick or with the specimens here described. The fact that no ovigerous females have been seen suggests the idea that they may belong to an immature form of some other species. But the only British species which comes near them in general character is *D. pulex*, and no one has ever noticed in its young the peculiarities of *D. minnehaha* or *D. hamata*. For the present, therefore, I regard this as a distinct specific form, its salient characters being the position of the eye near the middle of the head, the large and obliquely projected posterior spine which, however, in the adult would probably become median in position, the 4-5 dentate dorsal angle of the male and immature female, the small antennule and smooth, straight abdominal process of the male.

Daphnia minnehaha of Herrick makes a very near approach to this form but differs in some details—particularly as to the head and antennules of the male.

Daphnia longispina, O. F. Müller, (Pl. VIII., figs. 11-19).

1785. *Daphnia longispina*, O. F. Müller, Entomostraca, p. 88,
pl. XII., figs. 8-10.

1850. „ *pulex*, var. Baird, Nat. Hist. Brit. Entom.,
pl. VII., fig. 3.

1860. „ *longispina*, Leydig, Naturgeschichte der Daph-
niden, p. 141, pl. II., figs. 13-20.

1871. „ „ Fric, Die Krustenthierc Böhmens,
p. 233, fig. 36.

Female.—The outline as seen from the side (fig. 14) is rather elongated and ovate, the length, exclusive of the spine, being equal to nearly twice the height. The head is rounded, though

somewhat flattened in front, its lower margin forming a long sinuated curve, and ending in a slender, subacuminate, conical beak, the posterior margin of which has a pouting prominence (fig. 15). Dorsal margin of the valves gently and evenly arcuate, ventral more evenly arched and slightly protuberant just at the base of the terminal spine; posterior extremity narrowed, ending in a long, slender spine which rises above the middle line and projects nearly straight backwards. The abdominal processes are short and separate (fig. 16), terminal unguis of the post-abdomen more or less pigmented, feebly bidentate on the convex edge, and bearing a continuous row of very fine hairs on its concavity (fig. 17). Pre-anal spines 12-15 in number, increasing gradually in length from before backwards (fig. 16). The antennal setæ are as usual biarticulate, and each seta has, a little beyond the median joint, a conspicuous black pigment-fleck (fig. 18). Length, exclusive of the spine, about 1.55 mm. The ephippial female is rather shorter in proportion to its height, and has a strongly angulated dorsal margin (fig. 19).

Male.—The male is smaller than the female, subrhomboidal in outline, with nearly straight dorsal and ventral margins, the terminal spine long, projected slightly upwards and springing from the postero-dorsal angle (fig. 11). The head is without a beak and is deeply sinuated beneath. Antennules truncated, bearing six apical setæ, all of which are very delicate, four being very short, the other two about twice as long, but not prehensile (fig. 12). Abdominal processes rudimentary; pre-anal spines about six or eight in number (fig. 13). Length, 1 mm.

In the surface waters of small lakes and tarns *Daphnia longispina* is probably the most abundant species of the genus, occurring not only as a pelagic form, but likewise very plentifully amongst shore weeds. But it is by no means confined to such localities, small pools and ponds often producing it in abundance. Specimens from different places vary considerably in minor points, and on these variations many so-called species have been founded. Professor G. O. Sars* now reckons as mere varieties of *longispina*

* Oversigt af Norges Crustaceer, med foreløbige Bemærkninger over de nye eller mindre bekendte Arter, p. 19 (1890).

no fewer than eleven forms which had been previously described by himself or other authors as distinct species, and with a little ingenuity it would be quite possible largely to increase this number.

I collected many years ago in Paston Lake, Northumberland, numerous specimens of a *Daphnia* which I thought might be referable to *D. lacustris*, Sars. Prof. Sars has kindly examined some of these, and in his opinion they do not belong to *D. lacustris*, but to "one of the numerous varieties of *D. longispina*, in this case one which forms a transition to *D. hyalina*." It would seem that *D. galeata*, Sars, together with *D. longispina* and its varieties, are by far the most abundant of our lacustrine *Daphniae*, but that while *D. galeata* often descends into the abysses of our deepest lakes, *D. longispina* seldom or never does so.

The species to which O. F. Müller referred in his original description of *Daphnia longispina* must remain doubtful; but the name is used by most authors with reference to a central type, round which are clustered numerous long-spined and round-headed varieties, which cannot be specifically separated by any permanent or well-marked characters. It would seem, therefore, unwise to disturb this general agreement by futile conjectures as to the species or variety which Müller really had in view.

Var. major, G. O. Sars (fig. B).

Daphnia longispina, var. *major*, Richard, Revision des Cladocères, p. 292, pl. 23, fig. 2.

Head small, occupying one-fourth to one-fifth of the entire length of the body; rostrum acute, not much reflexed; eye-spot very minute; dorsal and ventral margins of the valves boldly arched, dorsal margin having a gentle depression behind the head; spine long and slender, conspicuously bulging at its base on the ventral aspect: post-abdomen bearing fourteen or fifteen pre-anal spines. The limbs are of a deep brown colour (spirit-specimens) and the post-abdominal teeth and unguis are similarly coloured. Shell very distinctly reticulated. In no stage



FIG. B.

Daphnia longispina, O. F. Müller,
var *major*, Sars, $\times 16$.

of growth is the vertex produced into a spine, though there may sometimes be observed a small tooth at the antero-dorsal angle. Length, 3 millimetres.

The specimens here described were taken by the Rev. Canon Norman in Loch Rutton, Kirkcudbrightshire, and might almost, from their very marked characters, claim to rank as a distinct species. Professor G. O. Sars, however, has named, but not described, several varieties, and this seems to agree with M. Richard's figure and description of the variety *major*.

Var. *aquilina*, G. O. Sars, (Pl. X., figs. 9, 10).

1863. *Daphnia aquilina*, G. O. Sars, Zoologisk Reise i Christianias og Trondhjems Stifter, p. 24.

1890. „ *lacustris*, var. *aquilina*, Sars, Oversigt af Norges Crustaceer, etc., p. 33.

The original description of *D. aquilina* is as follows:—“*D. lacustri* perquam affinis sed diagnoscenda margine inferiore capitis incisuram profundam acutangulatam formante rostroque acuminato et valde prominente rostri aquilini instar retro curvato, testa a latere visa rotundato-ovata spinaque brevissima et debili. Animal colore obscuro-cæruleo saturato insigne. Longit. circit, $2\frac{1}{2}$ mm.”

In his recent revision Professor Sars adopts his specific name as a varietal name only. I am not by any means sure that the form here figured, from specimens taken by Mr. Thomas Scott, in Loch Arklet, Perthshire, is actually identical with the *aquilina* of Sars, but the head at any rate is very closely similar.

Generally it seems to have more in common with *D. longispina* than with *D. lacustris*. A gathering made by the Rev. Dr. Norman in Mochrum Loch, Wigtonshire, contains specimens of similar character.

Whilst these pages have been going through the press I have received from Mr. T. Scott a second very interesting gathering from Loch Arklet, containing females of the ordinary kind together with many males and ephippial females. This collection was made late in the season—November. The males are very similar to those from Paston Lake, Northumberland, which I have described and figured as *D. longispina*. Sars does not appear to have seen the male *aquilina*.

Daphnia lacustris, G. O. Sars, (Pl. X., figs. 19, 20).

var. *vicina*, Richard, (Pl. VII., figs. 18–21).

1862. *Daphnia lacustris*, G. O. Sars, Om de i Omegnen af Christiania forekommende Cladocerer (andet Bidrag), p. 19 (separate copy).

1896. „ *lacustris*, var. *vicina*, Richard, Revision des Cladocères (Annales des Sciences Naturelles), p. 307, pl. XXIV., fig. 1.

The typical form of this species (pl. IV., fig. 19) is very similar to *D. longispina*, but the head is flatter in front and the forehead more prominent in the eye-region, behind which the lower border of the head runs backwards almost in a straight line, and ends in a sharp but not very prominent beak, the hinder margin only slightly sinuated, protuberance of the antennule very slight. Spines of the post-abdominal laminae 9–12 in number; abdominal processes confluent at their bases, the anterior process very long, much longer than the terminal unguis. Base of the shell-spine without any anterior bulge. Length, 1.55 mm.

The form described by M. Richard, from Loch Leven specimens, as a distinct variety (*vicina*) is founded chiefly on the presence of a small tooth on the top of the head (pl. VII., fig. 21). This, however is a character of the young only, disappearing altogether in the adult (fig. 19).

In Loch Leven, Kinross, this species is found abundantly, and from that locality specimens have been kindly sent to me by the Rev. Dr. Norman and by Mr. T. Scott. From Loch Lomond also I have recently received specimens taken by Mr. Scott, and I think that others, taken also by Mr. Scott, in the Mill Loch, Mid Yell, Shetland, belong to the same species.*

I am indebted to the kindness of Professor G. O. Sars for specimens of *D. lacustris* from Maridals Vand, near Christiania. These, of course, may be taken as authentic examples of the species which was originally described by that accurate observer; and one of them is represented in plate X. of the present memoir. In some details it does not seem to agree with Sars' description, notably in the size and shape of the abdominal processes (fig. 20), which are said to be "much shorter than in *D. longispina*." The Paston Lake specimens—the abdomen of which is figured in plate VIII., fig. 16—show processes decidedly shorter than those of *D. lacustris*, and the Paston species is identified by Prof. Sars as "one of the numerous varieties of *D. longispina*, forming a transition to *D. hyalina*." I believe, however, that *D. lacustris* and *D. longispina* are really distinct species, and so far as the females are concerned—I have seen no males of *D. lacustris*,—I should be disposed to lay stress upon the following distinctions, which may perhaps best be contrasted in tabular form:—

<i>D. lacustris.</i>	<i>D. longispina.</i>
Head in the young bearing a vertex-tooth	Head in the young without a vertex-tooth
Forehead very prominent in the eye-region	Forehead not conspicuously prominent in the eye-region
Anterior abdominal process very long	Abdominal processes short and subequal
Shell evenly tapered at the base of the posterior spine	Base of the posterior spine distinctly bulging ventrally
[Colour blueish, Sars.]	[Colour greenish, Sars.]

* Mr. D. J. Scourfield, who has given me most valuable help in the study of Cladocera, finds in Warren Pond, Chingford, a form which is in every respect identical with the Norwegian types of *D. lacustris*.

Daphnia hyalina, var. *pellucida*, P. E. Müller, (Pl. X.,
figs. 14, 15).

1867. *Daphnia pellucida*, P. E. Müller, Danmarks Cladocera,
p. 116, pl. I., fig. 5.

1890. „ *hyalina*, var. *pellucida*, G. O. Sars, Oversigt
af Norges Crustaceer, pp. 10, 34.

1892. „ „ „ Scourfield, Some new Records of British
Cladocera (Journal of Quekett Microscopical Club, vol.
V., Ser. 2), p. 66, pl. V., fig. 1.

Female.—Outline as seen from the side subovate, with a very long, slender, and slightly curved spine. Head occupying about one-third of the length of the body, well rounded in front, ventral margin straight or very slightly sinuated and terminating in a slightly produced beak: dorsal border of the shell forming a continuous very gentle curve, somewhat flattened in the middle, ventral margin rather boldly convex. The post-abdominal spines are slender and simple except for a fringe of excessively delicate hairs; in front of the unguis is a marginal series of 10–12 curved setæ, progressively increasing in size from behind backwards: dorsal abdominal processes obsolete. Eye rather large, placed near the centre of the head; between it and the rostrum is generally visible a minute eye-spot. Shell often very distinctly chequered: in other cases nothing but a granulated structure is visible. Length, 1·8 mm.; height, ·9 mm.

Hab.—Duddingston Loch, near Edinburgh. For specimens from this locality I am indebted to the Rev. Canon Norman, F.R.S. I do not certainly know of its occurrence elsewhere in Britain, but the Duddingston specimens agree exactly with Swedish ones named by Professor Lilljeborg and sent by him to Dr. Norman.

This form was described by Dr. P. E. Müller as a distinct species under the name *Daphnia pellucida*. Dr. Müller has, however, more recently (*vide* G. O. Sars) withdrawn the specific name, considering it to be merely a variety of *D. hyalina*, Leydig. Mr. Scourfield has recorded the typical *D. hyalina* from several localities in Essex, and has kindly sent me specimens: they certainly approach very closely the variety here described.

Daphnia galeata, G. O. Sars, (Fig. C and Pl. IX., figs. 10-17).

1863. *Daphnia galeata*, G. O. Sars, Zoologisk Reise i Sommeren, 1862, p. 21.

1867. „ „ P. E. Müller, Danmarks Cladocera, (Naturhist. Tidsskrift. III.), p. 117, pl. I., fig. 6.

The characters which distinguish this species from *D. Kahlbergensis* are noticed further on: in other respects a description of the one form may very well be applied to both. It

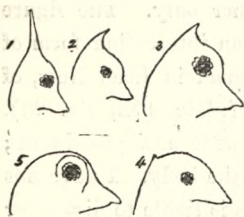


FIG. C.

Daphnia galeata, Sars, $\times 20$.
Different forms of head in specimens from Loch Vennachar, arranged in order of age.

may further be stated that the pigment spots which are so conspicuously developed in the antennal setæ of *D. longispina* are also present in *D. Kahlbergensis* and *D. galeata*, though not so distinctly, their position being sometimes indicated only by a thin transverse line. The size of *D. galeata* varies a good deal according to locality, the following being the length measurements of fully grown speci-

mens from English, Scottish and Irish stations: Windermere, 2.1 millimetres; Loch Oich, Inverness-shire, 3 mm.; Lough Erne, 1.9 mm. The Loch Oich examples are gigantic compared with others; they are also more deeply coloured and have the bulging at the base of the posterior spine which is seen also in *D. longispina*, but not elsewhere, so far as I know, either in *D. galeata* or *D. Kahlbergensis*.

Daphnia galeata occurs in vast numbers in most of the lakes of Great Britain and Ireland, both at the surface and in the greatest depths, but is usually most abundant at a considerable distance below the surface. Though first described by Prof. G. O. Sars from Norwegian specimens, and more recently by P. E. Müller in Denmark, it does not appear to have been found elsewhere on the Continent of Europe, the form found in Bohemia by Hellich, and called by him *galeata*, being probably referable to *D. Jardinii*. Neither does it seem to have been recognized in America. Herrick, in his "Entomostraca of Minnesota," gives *galeata* as a synonym of *hyalina*, but his figures evidently have nothing to do with the species now under consideration.

Var. *obtusifrons*, G. O. Sars, (Pl. IX., fig. 22).

1890. *Daphnia galeata*, var. *obtusifrons*, G. O. Sars, Oversigt af Norges Crustaceer med foreløbige Bemærkninger over de nye eller mindre bekjendte Arter., p. 33.

1897. *Daphnia galeata*, var. *obtusifrons*, Richard, Revision des Cladocères, pl. XXIV., fig. 17.

The varietal name *obtusifrons* has been applied by Prof. Sars to a form of *D. galeata* without cephalic spine, which he has found during the early months of summer only. The figure given by M. Richard closely agrees with an interesting form of *D. galeata* taken by the Rev. Canon Norman in Loch Ness, of the head of which I give an outline (plate IX., fig. 22). The beak, it will be seen, is extremely wide and prominent; though the head is small in proportion to the body. I have not been able to detect any eye-spot, but this is liable to disappear by prolonged maceration in spirit. In general shape the animal resembles the variety *major* of *D. longispina*, but it is very much smaller, almost colourless, and has no basal dilatation of the terminal spine. The number of caudal teeth is about twelve. Length, 1.6 mm.

I can scarcely think that this form is a permanent one, or that it represents more than a transitory condition dependent on growth or some peculiarity of environment, but without an accurate knowledge of life-history it is impossible to arrive at a satisfactory conclusion as to the relations of the almost innumerable forms which, for the present, must be distributed under the specific names of *longispina*, *galeata*, *lacustris*, etc. In the case of the Loch Ness gatherings, many other forms are to be found mixed up with *obtusifrons*.

GENUS HYALODAPHNIA, Schoedler.

Hyalodaphnia Jardinii, (Baird), (Pl. X., figs. 12-15).

1857. *Daphnia Jardinii*, Baird, "On the food of fresh-water Fishes," (Edinb. New Philosophical Journal, N. S., vol. VI., part 2).

1867. *Daphnia cucullata*, P. E. Müller, Danmarks Cladocera (Naturhistorisk Tidsskrift III.), p. 120, pl. I., fig. 23.

1874. ? *Daphnia vitrea* and *Daphnia apicata*, Kurz., Dodekas
neuer Cladoceren nebst iner Kurzen Übersicht der
Cladocerenfauna Böhmens (LXX. Bande der Sitzb.
der K. Akad. der Wissensch.), pp. 10, 11, pl. I., figs. 2, 3.
1877. ? *Daphnia galeata*, Hellich, Die Cladoceren Böhmens,
p. 36, fig. 10.
1877. „ *cucullata*, Hellich, Die Cladoceren Böhmens,
p. 37.
1886. „ *cucullata*, Eylmann, Beitrag zur Systematik
der europäischen Daphniden (Berichte der
Naturforsch. Gesellsch. zu Freiburg), p. 40,
t. IV., fig. 2.
1890. *Hyalodaphnia Jardinii*, G. O. Sars, Oversigt af Norges
Crustaceer II. (Christiania Videns.-Selsk. For-
handl. 1890, No. 1), pp. 10, 34.
- (Not *D. Jardinii*, Brady, Intellectual Observer, vol. XII., p. 419).

Female.—Seen from the side the outline is narrow and elongated, slightly higher behind the middle than in front; the head is conical in outline, occupies nearly half of the whole area of the body and is only slightly narrower than the trunk; in front it is very obtusely pointed, its ventral margin curved in front, but behind the middle almost rectilinear as far as the very obtuse, slightly rounded, and backwardly-produced beak: the dorsal margin of the body is evenly curved throughout the region of the head, behind which there is a slight depression, followed by a gentle convexity as far as the base of the long spine which springs from the middle of the posterior extremity and is bent upwards with a gentle curve, its length being about equal to that of the body exclusive of the head: ventral margin behind the head evenly convex. The caudal laminae (fig. 13) have slender and unarmed terminal unguis, the marginal teeth six to eight in number and gradually decreasing in length from behind forwards; dorsal abdominal processes short and confluent at their bases. Eye very small, about one-eighth of the length of the head. The shell is in no part distinctly reticulated, though sometimes an indistinct reticulation may be made out over small areas: for the most part it has a dotted or granulated appearance. Length, exclusive of the spine, 1.5 mm.; height, .65 mm.

The only British locality in which *Daphnia Jardinii* has hitherto been found is Lochmaben, Dumfriesshire, where it occurs in several of the lakes. It was first found there by Dr. Baird, and has more recently been taken abundantly by Dr. Norman and myself. Together with another interesting Entomostracan—*Bosmina Coregoni*—it seems, as was pointed out by Dr. Baird, to constitute a principal part of the diet of the Vendace—a fish peculiar to Lochmaben and said to have been introduced there by the Romans.

Hyalodaphnia Kahlbergensis (Schoedler), (Pl. IX., figs. 18–20; pl. X., figs. 16, 17).

1864. *Daphnia Kahlbergensis*, Schoedler, Die Cladoceren des frischen Haffs (Archiv f. Naturgeschichte XXXII., Jahrg I. Bd.), p. 18, pl. I., figs. 1–3.

Female.—Seen from the side the shell is elongated, the greatest height situated behind the middle, and equal to about one-third or one-half of the length. Head narrower than the body, and occupying from one-third to one-half of its length, widest at the posterior or rostral end, tapering evenly to the front, and there produced into a more or less acute median spine, which points directly forward or may have a slightly dorsal bend; ventral margin of the head sinuous and more or less prominent in the middle, ending in a subacute, prominent beak. Dorsal margin of the shell almost straight in front over the head, then gently curved to the hinder extremity, but with a slight depression near the middle; ventral margin boldly arched, ending in a long spine which springs from near the dorsal angle and is directed backwards and slightly upwards; the spine, together with the posterior shell margin, is fringed with sharp spinules. Dorsal processes of abdomen (plate X., fig. 17) extremely small; pre-anal spines ten to twelve in number and progressively larger from before backwards; terminal unguis long, slender, and without serratures on its convex side, but having its concavity fringed with a series of very delicate, closely-set hair-like cilia. Length, 2.1 mm.

Hab.—Loch Garry, Inverness-shire (Rev. Canon Norman); Lough Erne, Ireland (Dr. Creighton).

On this species, together with several other nearly allied forms, Schoedler founded the genus *Hyalodaphnia*, of which the only tangible characters are the absence of an "eye-spot" and the produced helmet-shaped head. The value of these distinctions is very doubtful. Some of the helmeted forms, as for instance the following species, *D. galeata*, have always a small, though distinct, eye-spot, but are in other respects so closely similar to *D. Kahlbergensis* as to be with difficulty distinguished. Under these circumstance Schoedler's generic name seems of questionable value, and it may even be doubted whether all the members of the helmeted group should not be looked upon as mere varieties of one very Protean species. This, in fact, is to some extent the view taken by Professor G. O. Sars, who in a recent work,* while admitting the genus *Hyalodaphnia*, makes *H. berlinensis* and *H. Kahlbergensis* varieties of *H. Jardinii*, and with reference to the latter species he makes the interesting observation that the early spring broods have rounded heads without any trace of the crest, which makes its appearance only in the summer broods. Comparing these observations with my outline drawings of various stages of *H. Kahlbergensis* from Lough Erne it will be seen that there is a somewhat similar progressive variation in the shape of the head from the young to the adult form (figs. 18–21). But it is in the young that we find the acutely-crested head, the high helmet form gradually giving place to the short vertex-spine of the adult.

The characters, which may be taken as separating *D. Kahlbergensis* from *D. galeata*, are the large size of the head, its wedge-shaped outline, broad at the base or posterior end and gradually tapering to an acute apex, and the absence of an eye-spot: the vertex-spine, which in *D. galeata* has a ventral bend, is here either straight or slightly bent towards the dorsum. I am confirmed in this view of the distinctness of the two forms by the fact that specimens kindly sent to me by Dr. Creighton

* Oversigt af Norges Crustaceer—(Christiania Videnskabs-Selskabs Forhandlinger, 1890).

from two different localities in Ireland,—Lough Erne and Melvin Lough, near Ballyshannon, have these distinctive characters extremely well marked, the Lough Erne specimens being all referable to *D. Kahlbergensis*, the Lough Melvin specimens to *D. galeata*.

GENUS DACTYLURA,* nov. gen.

Female generally like *Daphnia*. In the male the antennule has several short sensory filaments and one very long filament, which is not prehensile or hooked, but has a densely ciliated or pubescent apex (pl. VIII., fig. 2). The prehensile hook of the first foot has an excrescent tooth at its base, and the caudal lamina bears in front of the terminal unguis a finger-like lobe (figs. 4, 5). The body generally is in both sexes pubescent, this being especially evident in the antennæ and caudal laminæ.

Under this genus will come *Daphnia Atkinsoni*, Baird, *D. magna*, Strauss (= *Schæfferi*, Baird), possibly *D. psittacea*, Baird, and a species here for the first time described, *Dactylura pubescens*.

Dactylura pubescens, n. sp. (Pl. VIII., figs. 1–10, 20).

Female.—Head well rounded in front (fig. 6), produced below into a subacute but not very prominent beak, lower margin slightly sinuated; dorsal margin of the shell almost straight, with a slight sinuation just behind the head; ventral margin very strongly arched and prominent; posterior extremity slightly tapered, and produced a little below the dorsal line into a short spine. The margins behind the middle of the shell are fringed with numerous small, closely-set lancet-shaped spines, and, on a line just internal to these and corresponding pretty nearly to every third interspinous space, is a series of long setæ (fig. 6a). Antennules short and subconical, with widely truncated apices. Antennæ (fig. 7) short and densely pubescent. Abdominal processes distinct, subequal, densely setiferous (fig. 8); post-abdomen tapering up to the acute posterior extremity and bordered by a

* δάκτυλος a finger, οὐρά a tail.

series of small, equal spines, about twenty-five in number; terminal unguis (fig. 9) smooth on its convex margin; its concavity finely ciliated, and towards the base bearing two sets of rather stout spine-like setæ. Shell polygonally reticulated (fig. 10). Length, 2.5 mm.

Male.—Shell seen from the side subrhomboidal in outline; head flattened in front and without any beak (fig. 1), dorsal and ventral margins subparallel, dorsal nearly straight, ventral very slightly convex and trending upwards towards the hinder end; posterior extremity slightly narrowed and rounded off. Antennules (fig. 2) two-jointed, truncated and slightly dilated at the apex, which bears several small cilia and one long, stout, biarticulate seta, the terminal portion of which is fringed with cilia. First pair of feet (fig. 3) provided as usual with a long, stout seta, a strong falcate hook, a branchial lamina with eight plumose setæ, and an intermediate small non-plumose seta. Abdomen (fig. 4) destitute of dorsal processes; post-abdomen wide and obliquely truncated at the extremity; marginal spines obsolete, terminal unguis stout (fig. 5), finely ciliated and bearing near the base two suberescence patches of stout setæ: attached close beneath the base of the unguis is a club-shaped appendage consisting of a massive rounded protuberance, from which projects downwards a stout handle-like process; the basal prominence bears a few short teeth. Length, 1.4 mm.

The whole animal in both sexes is densely pigmented, making it very difficult to get a view of the structural details except by dissection; the limbs themselves are of an almost sooty blackness and the shell is brown.

This interesting species has hitherto been found only in one locality,—a pond on the road side about a mile west of Staithes, Yorkshire. In this gathering (May, 1886) it occurred rather plentifully, but I have seen only one male.

Dactylura magna, Strauss, (Pl. X., figs. 1-8, 18).

1820. *Daphnia magna*, Strauss, Mémoire sur les Daphnia de la Classe des Crustacés (Mém. de Museum, Tom. V., VI.).

1850. *Daphnia Schæfferi*, Baird, Brit. Entom., p. 93, pl. VII.,
figs. 1, 2; pl. VIII., figs. A-I.

1896. „ *magna*, Richard, Revision des Cladocères (Ann.
des Scien. Naturelles, 8^e Serie, Zoologie), p.
192, pl. XX., fig. 1; pl. XXIV., figs. 6-13.

Female.—Seen from the side the outline is broadly subovate, greatest height situated near the middle and equal to about two-thirds of the length; the dorsal margin forms a flattened arch with a slight depression near the middle; ventral margin evenly and very boldly convex, passing with an almost semicircular sweep from its origin behind the head to the base of the posterior spine, in front of which there is a slight bulge; spine not very long, generally about one-fourth or one-fifth of the length of the body, and directed slightly towards the dorsal aspect. The head is depressed, very small and narrow, and produced into a sharp beak which projects straight downwards, the antennules forming a prominence on its posterior margin. Antennules conical (fig. 3), the apex of each studded with a group of nine bead-like papillæ, from each of which springs a fine sensory filament. Antennæ densely clothed with short scale-like hairs. Caudal laminae (fig. 4) wide in front and tapering rapidly to the extremity, in front of which the margin is deeply sinuated; in front of the sinus is a series of 12-14 spines of nearly uniform length, behind the sinus a shorter series of 6-8 rather smaller spines; terminal ungues finely pectinated; the sides of the laminae towards the base densely clothed with a short rigid pubescence. Dorsal abdominal lobes confluent at their bases, the anterior lobe very long and flexuous. Eye rather large, situated near the anterior margin of the head. Intestinal cæca very conspicuous and forming subcircular loops near the back of the head. Margins of the valves smooth in front, but behind the middle fringed with short spines. Shell marked with small quadrangular reticulations, which, however, become polygonal towards the head and anterior margin. Length, 4 mm.

Male.—Outline subquadrangular, height equal to more than two-thirds of the length, dorsal and ventral margins subparallel. Head slightly prominent in front, its lower margin almost straight,

rounded off behind: dorsal margin of the valves very gently arched towards the front, but almost straight for the greater part of its course, ventral forming a continuous gentle curve; anterior and posterior extremities nearly equal, broad and obliquely subtruncate; the spine is on a line with the dorsal margin and directed slightly upwards. Antennules (fig. 9) composed of a peduncle bearing a single long seta which is indistinctly divided into three tracts, the middle portion very slender, the apical portion slightly bulbous at its base and thickly beset with very minute hairs. The peduncle has near its apex a rosette of nine papillæ, supplied with nerve fibres and giving origin as usual in *Daphniæ* to delicate sensory filaments. Post-abdominal laminæ (fig. 6) bearing a wide spinule-fringed finger-like lobe just in front of the terminal unguis, and in front of the lobe a deep sinuation, which is fringed with about twelve curved spines: the dorsal abdominal processes are quite rudimentary. The margins of the shell are spiniferous behind the middle as in the female, and the ventral margin bears also a dense fringe of hairs which are thickest and most numerous about the anterior angle just behind the head. Length, 2 mm.

This is the largest and at the same time one of the less common species of *Daphniada*, though generally distributed over Europe, Western Asia and North Africa. It has not been found in America, nor is there any record of its occurrence in Scotland or Ireland. In England it has been recorded by Dr. Baird from Bexley Heath, Kent, and Norwood Green, Middlesex. Dr. Norman has found it at Layton Farm, near Sedgely, co. Durham, and I have myself taken it in a pond at Canal Farm, High Barnes, near Sunderland, in a quarry pond between Plessey and Blagdon, Northumberland, and at Tresco (Scilly Islands). Mr. Scourfield records that in 1893 this species "occurred in astonishing abundance in the London Docks."

The development of the male of *D. magna* well illustrates one of the difficulties which beset the naturalist in the investigation of species whose life-history is not thoroughly known. In my gathering from the Plessey pond all the males which I could find presented characters of antennules and caudal lamellæ quite

different from those of the adult *D. magna*, and I at first believed that I had got hold of an undescribed species. But, knowing that my friend Dr. Norman had taken a gathering from the same place and at the same time (at the Field Club Meeting of May 26th, 1865) I asked him if he could supply me with further specimens. This he kindly did, and I fortunately found amongst them a fully-developed male of the normal type. Had I not done so I might possibly have remained under the impression that the Plessey animal belonged to another species altogether. I have figured the antennules and caudal laminae (figs. 7, 8), which I believe to belong to immature males of *D. magna*. It will be noticed that the tactile (?) lobe of the caudal lamina is not developed, but that its place is occupied by a series of spines similar to those of the adult female, and though the stem of the antennule is well grown—showing that the specimens are undoubtedly males—its terminal sensory hairs are altogether different in character from those of the adult.

[*Daphnia psittacea*, Baird, (Brit. Entom., p. 92, Tab. IX., figs. 3, 4), is quite unknown to me, though noted by some continental authors].

GENUS MOINA, Baird.

Valves quadrangular with rounded angles. Head rounded, without a rostrum, separated from the body by a distinct constriction. Antennules very large, fusiform, bearing in the middle a long seta. Post-abdomen fringed with numerous ciliated teeth. No eye-spot.

Moina rectirostris, (O. F. Müller). Fig. D.

1785. *Daphnia rectirostris*, O. F. Müller, Entomostraca, p. 92, tab. XII., figs. 1-3.

1820. *Monoculus rectirostris*, Jurine, Histoire des Monocles, p. 134, pl. V.3, figs. 3, 4.

1850. *Moina rectirostris*, Baird, British Entomostraca, p. 101, pl. XI., figs. 1, 2.

Female.—Seen from the side the outline of the valves is subquadrangular, with rather irregularly sinuous margins and

rounded angles; the head much narrower and separated by a constricted neck, rounded off in front and below and sinuous

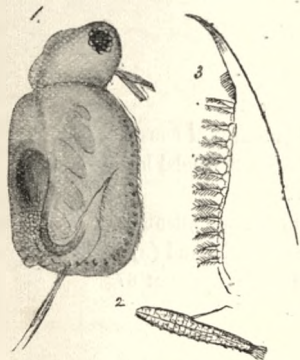


FIG. D.

Moina rectirostris.

1. Female seen from right side $\times 28$.
2. Antennule $\times 55$.
3. Post-Abdomen $\times 105$.

dorsally. Antennules simple, fusiform (fig. D 2), with a few small terminal sensory filaments and a single long hair near the middle of the anterior margin. Antennæ similar to those of *Daphnia* but having a single short spine, in addition to the natatory setæ, at the extremity of each branch. Post-abdomen (fig. D 3) slender, narrow, gently tapered to the extremity, and ending in a long, curved unguis; marginal setæ twelve, conical, subequal, and delicately plumose; base of

the unguis bearing a pectinate series of about fourteen fine cilia, no abdominal processes. Shell ciliated on the ventral margin, granular, with spots of pigment (?) irregularly scattered near the margins, more or less distinctly reticulated towards the posterior dorsal angle. Length, 1.4 mm.

The male I have not seen, but it is described by Dr. Baird and other authors as differing from the female much in the same way as the sexes differ in *Daphnia*.

Dr. Baird found this species in "a pond upon Blackheath, October, 1849." I have myself only once met with it, in a pond on Walton Common, near Brompton, Cumberland, July, 1897. Mr. Scourfield has taken it at "the Isle of Wight, Norfolk, Surrey, and in Epping Forest," and Dr. Norman has specimens taken by Mrs. Tupper Carey at Ebbesburne, near Salisbury.

A second species, *M. brachiata*, is recorded by Dr. Baird from the Blackheath pond and from "a stagnant pool in Old St. Pancras Road," which has since been built over.

EXPLANATIONS OF PLATES.

PLATE VII.

DAPHNIA PULEX.

- Fig. 1. Female seen from the right side $\times 27$.
 2. Caudal lamina and abdominal processes of female $\times 56$.
 3. Terminal unguis of same with apex of caudal lamina $\times 140$.
 4. Male seen from right side $\times 27$.
 5. „ lower margin of head with eye and antennule $\times 67$.
 6. „ ventral margin of shell with shell gland (a) $\times 56$.
 7. „ caudal lamina and abdominal processes $\times 67$.
Daphnia obtusa, var. *propinqua*.
 8. Head of female $\times 33$.

DAPHNIA HAMATA.

9. Female seen from left side $\times 33$.
 10. Head of female $\times 56$.
 11. Young female $\times 27$.
 12. Dorsal cephalic spines $\times 140$.
 13. Head of male $\times 56$.
 14. Abdomen and caudal laminae of male $\times 56$.
 15. „ „ of female $\times 40$.
 16. Terminal unguis and spines of caudal lamina $\times 140$.
 17. Part of basal joint of antenna $\times 200$.

DAPHNIA LACUSTRIS, var. VICINA.

18. Female seen from right side $\times 27$.
 19. „ abdomen and caudal lamina $\times 56$.
 20. „ unguis of post-abdomen $\times 140$.
 21. Young female seen from right side $\times 27$.

PLATE VIII.

DACTYLURA PUBESCENS.

- Fig. 1. Male seen from right side $\times 27$.
 2. Antennule of male $\times 67$.
 3. Foot of first pair $\times 67$.
 4. Caudal lamina $\times 67$.
 5. Unguis and apex of caudal lamina $\times 165$.
 6. Outline of female seen from right side $\times 27$.
 (a) spines of shell margin $\times 67$.

7. Antenna $\times 33$.
8. Abdomen and caudal lamina of female $\times 33$.
9. Unguis of caudal lamina $\times 140$.
10. Reticulation of shell $\times 67$.
20. Antennule of female $\times 140$.

DAPHNIA LONGISPINA.

11. Male seen from right side $\times 37$.
12. Antennule of male $\times 175$.
13. Caudal lamina of male $\times 140$.
14. Female seen from right side $\times 27$.
15. „ head with antennule $\times 56$.
16. „ caudal lamina $\times 56$.
17. „ terminal unguis $\times 140$.
18. Antenna $\times 56$.
19. Ephippial female from right side $\times 33$.

DAPHNIA OBTUSA, var. PROPINQUA.

21. Young female seen from right side $\times 37$.
22. „ caudal lamina $\times 140$.

PLATE IX.

DAPHNIA SCHOEDLERI.

- Fig. 1. Female seen from right side $\times 27$.
2. „ abdomen and caudal lamina $\times 56$.
 3. „ terminal unguis $\times 140$.
 4. Shell structure $\times 140$.

DAPHNIA OBTUSA.

5. Female seen from right side $\times 27$.
6. „ caudal lamina $\times 56$.
7. Male seen from left side $\times 56$.
8. „ antennule $\times 140$.
9. „ caudal lamina $\times 80$.

DAPHNIA GALEATA.

10. Female seen from right side $\times 27$ (Windermere).
11. „ caudal lamina $\times 56$.
12. „ terminal unguis $\times 140$.
- 13-17. Various forms of head $\times 37$.
 13, 14 Windermere, 15 Lough Melvin,
 16 Loch Achray, 17 Loch Oich.

DAPHNIA KAHLBERGENSIS.

- 18-21. Outlines illustrating various stages of growth (Lough Erne Ireland) $\times 27$.

DAPHNIA GALEATA, var. OBTUSIFRONS.

22. Head of female.

PLATE X.

DACTYLURA MAGNA.

- Fig. 1. Female seen from right side $\times 16$.
 2. Male seen from right side $\times 27$.
 3. Antennule of female $\times 140$.
 4. Caudal lamina of female $\times 27$.
 5. Antennule of male $\times 56$.
 (a) apical filament of same $\times 140$.
 6. Caudal lamina of male $\times 56$.
 7. Antennule of immature male $\times 56$.
 8. Caudal lamina „ $\times 84$.
 18. Foot of first pair of male $\times 56$.

DAPHNIA LONGISPINA, var. AQUILINA.

9. Head seen from left side $\times 27$.
 10. Caudal lamina $\times 56$.

Var. NASUTA.

11. Female seen from right side $\times 27$.

HYALODAPHNIA JARDINII.

12. Female seen from right side $\times 33$.
 13. Caudal lamina $\times 135$.

DAPHNIA HYALINA, var. PELUCIDA.

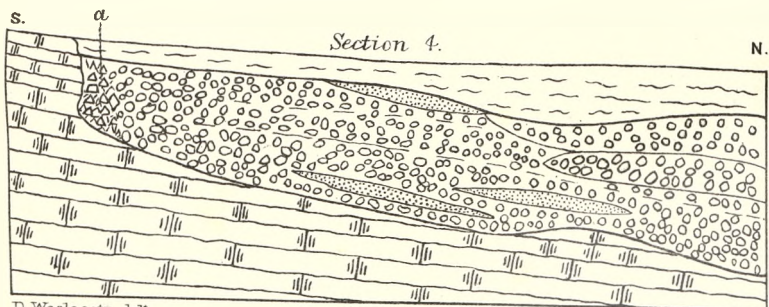
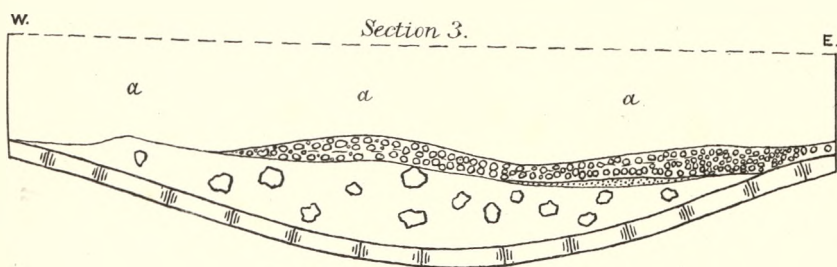
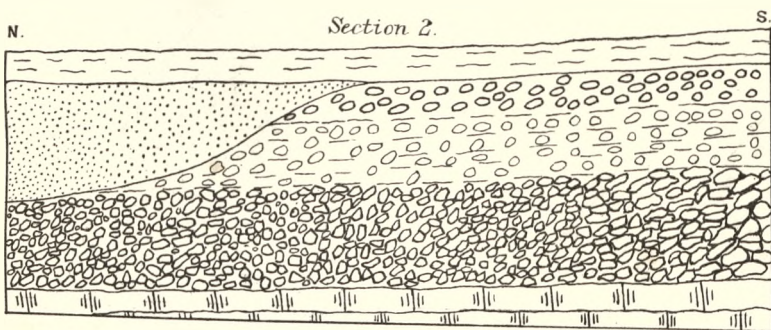
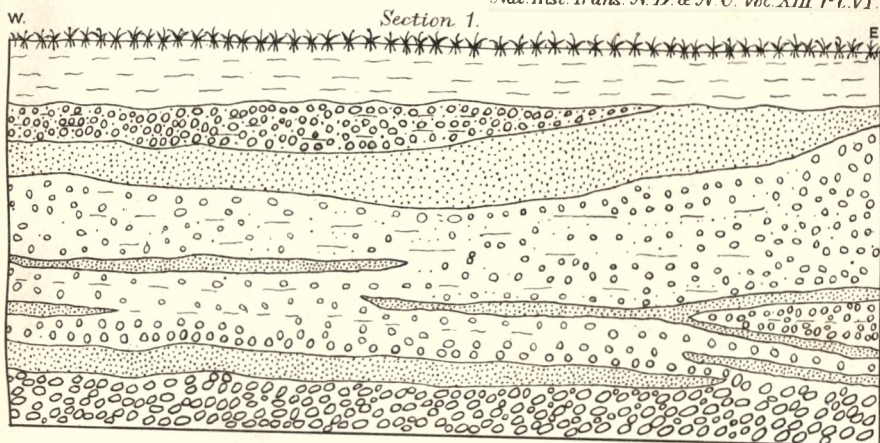
14. Female seen from left side $\times 27$.
 15. Caudal lamina $\times 56$.

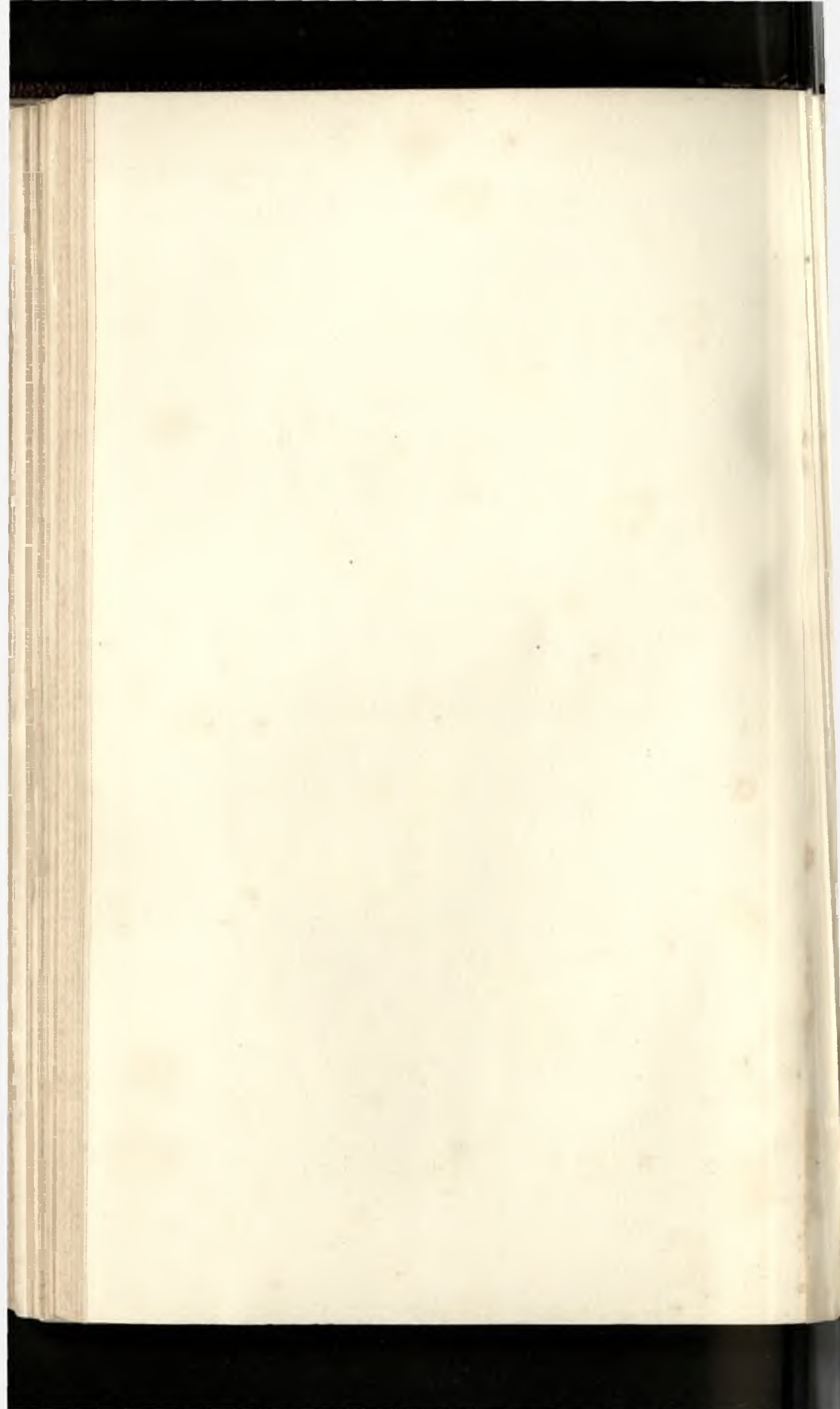
DAPHNIA KAHLBERGENSIS.

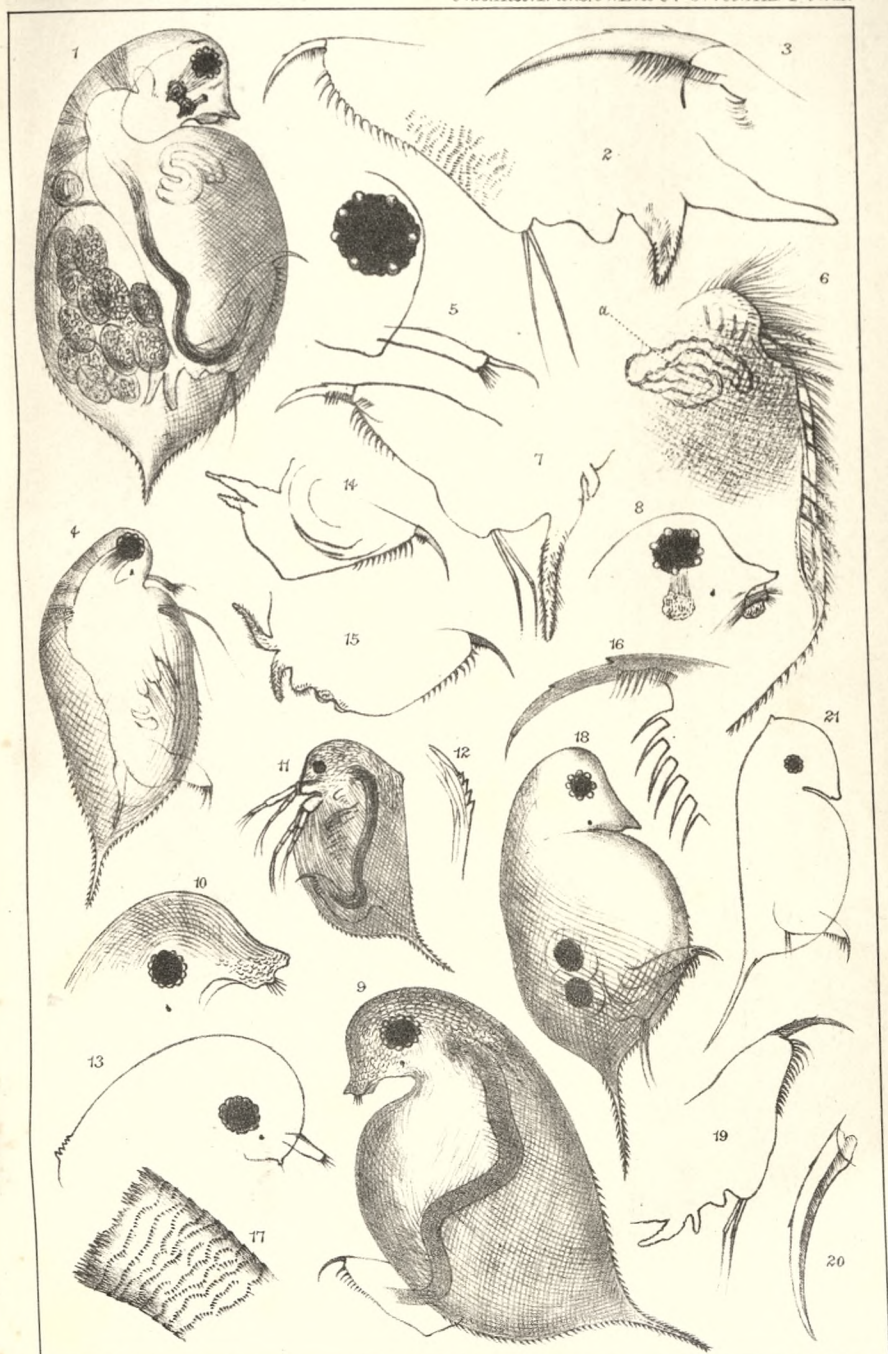
16. Female seen from left side $\times 27$.
 17. Caudal lamina $\times 56$.

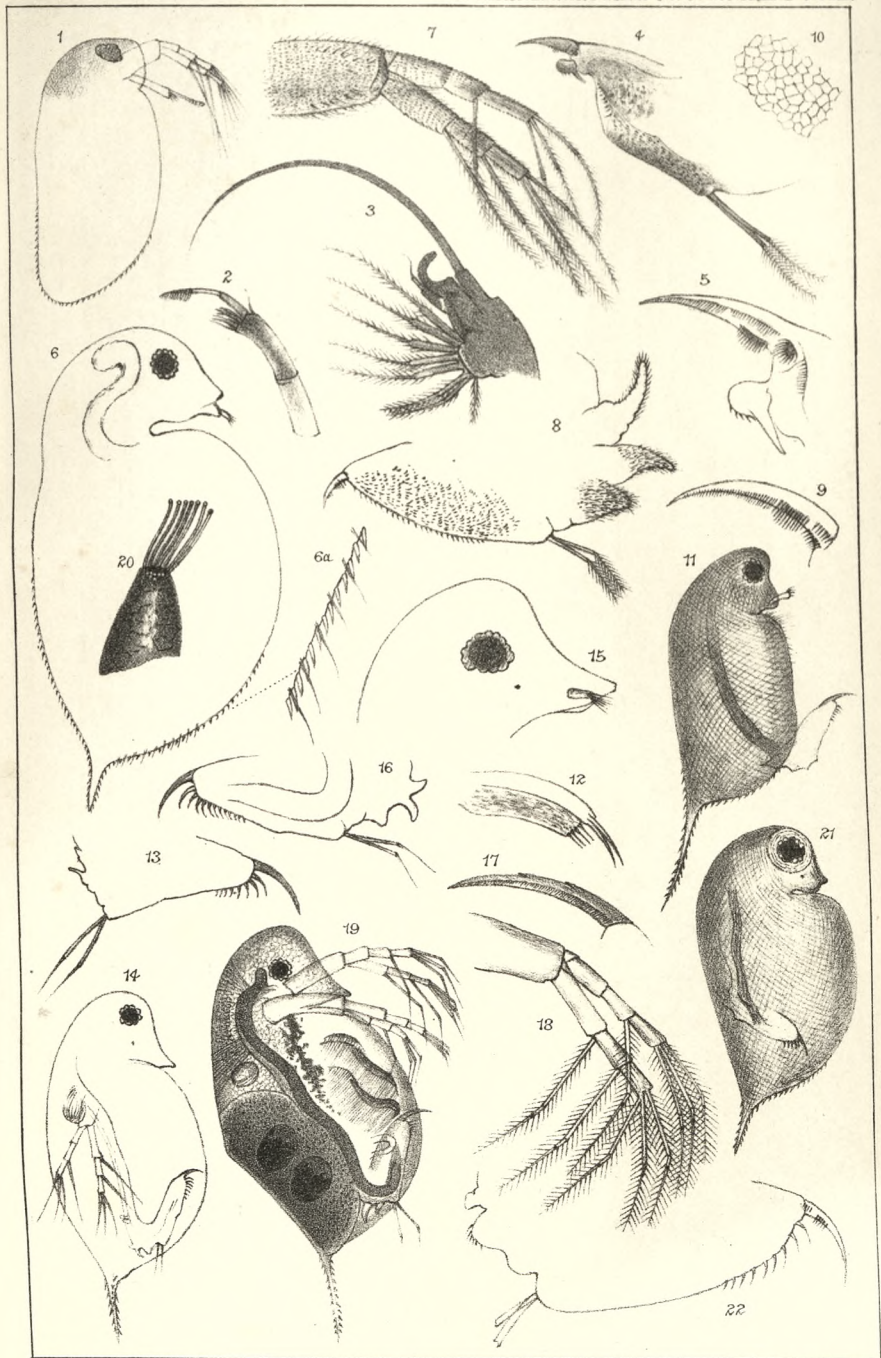
DAPHNIA LACUSTRIS.

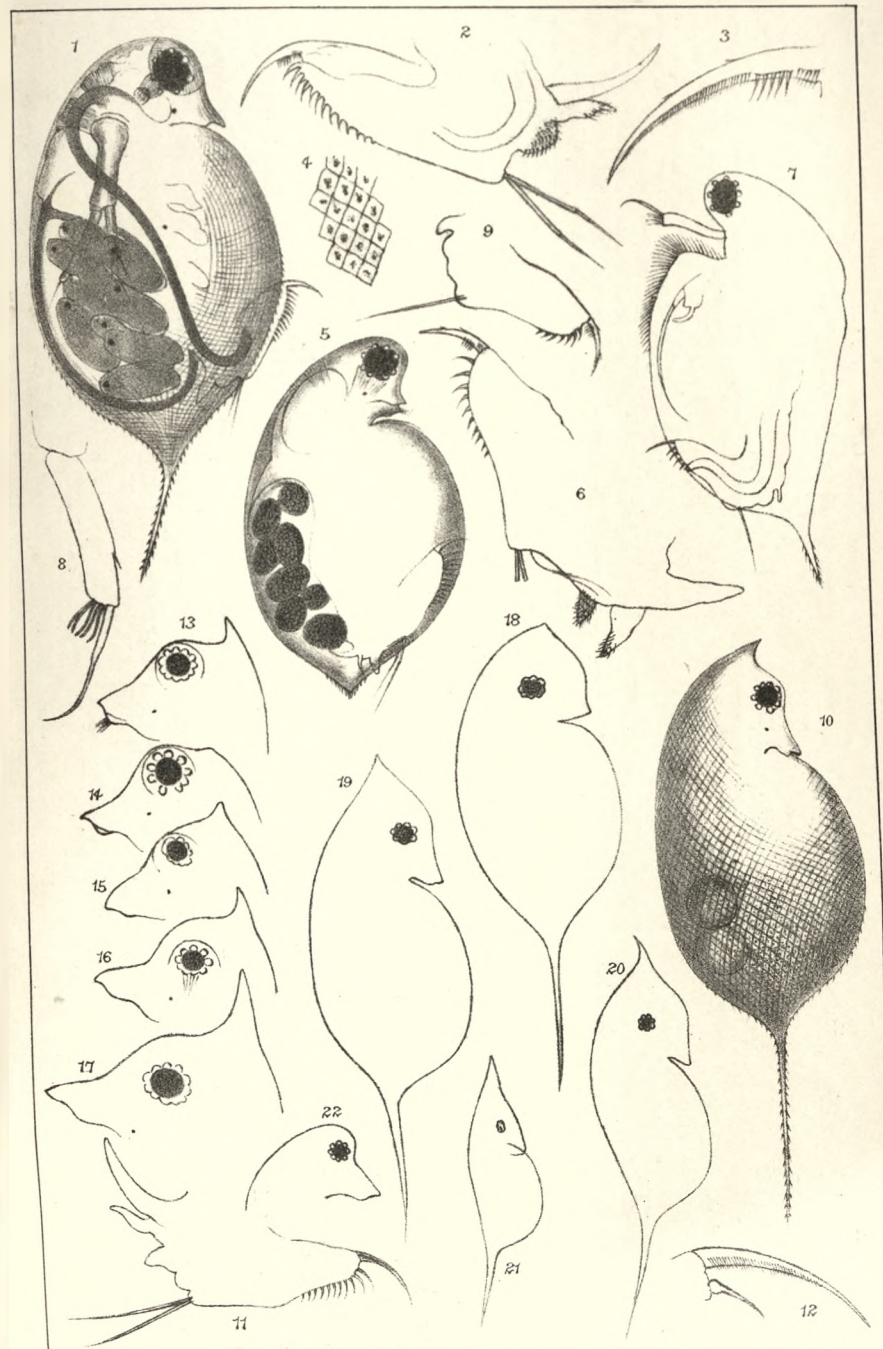
19. Female seen from right side $\times 33$.
 20. Caudal lamina $\times 56$.

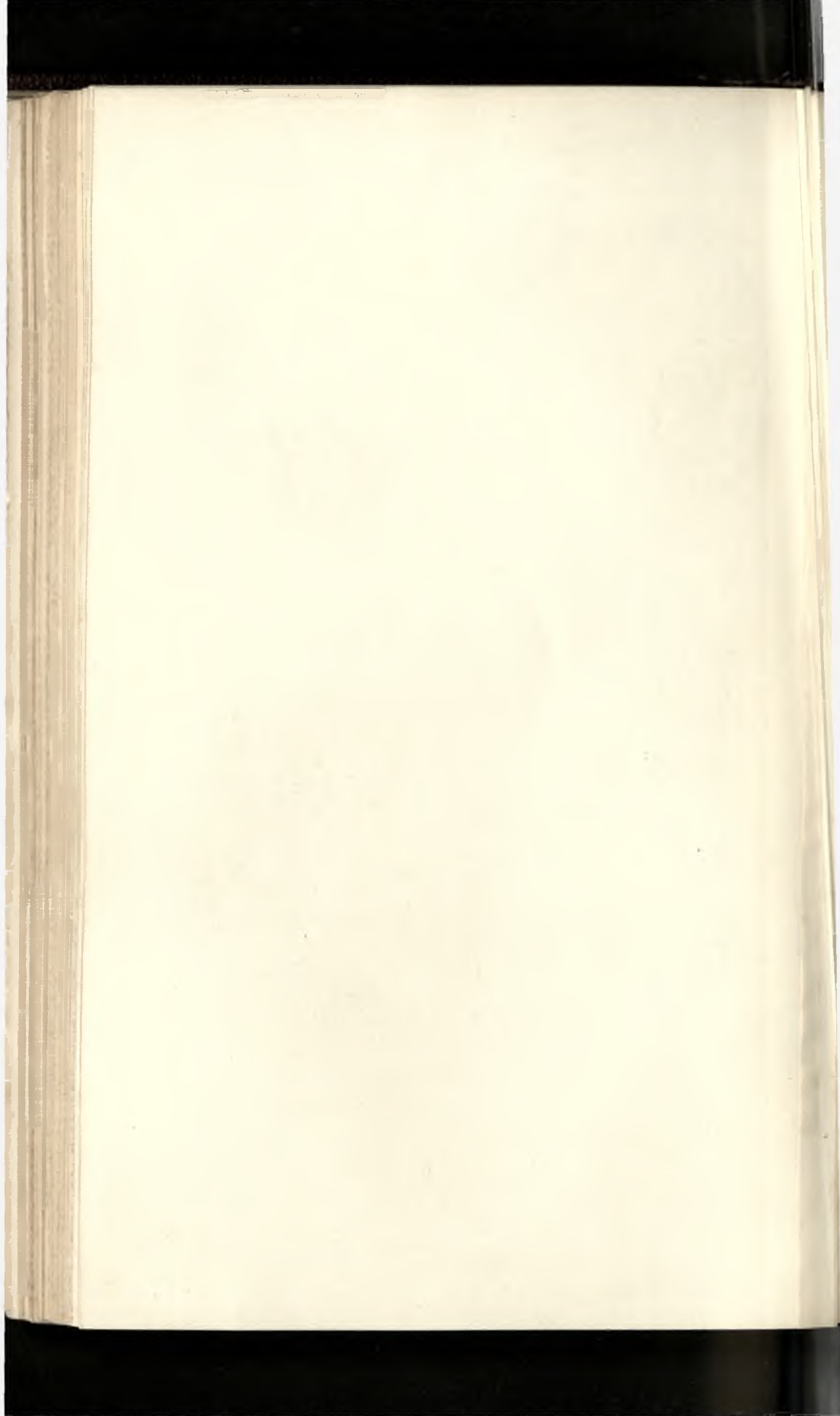


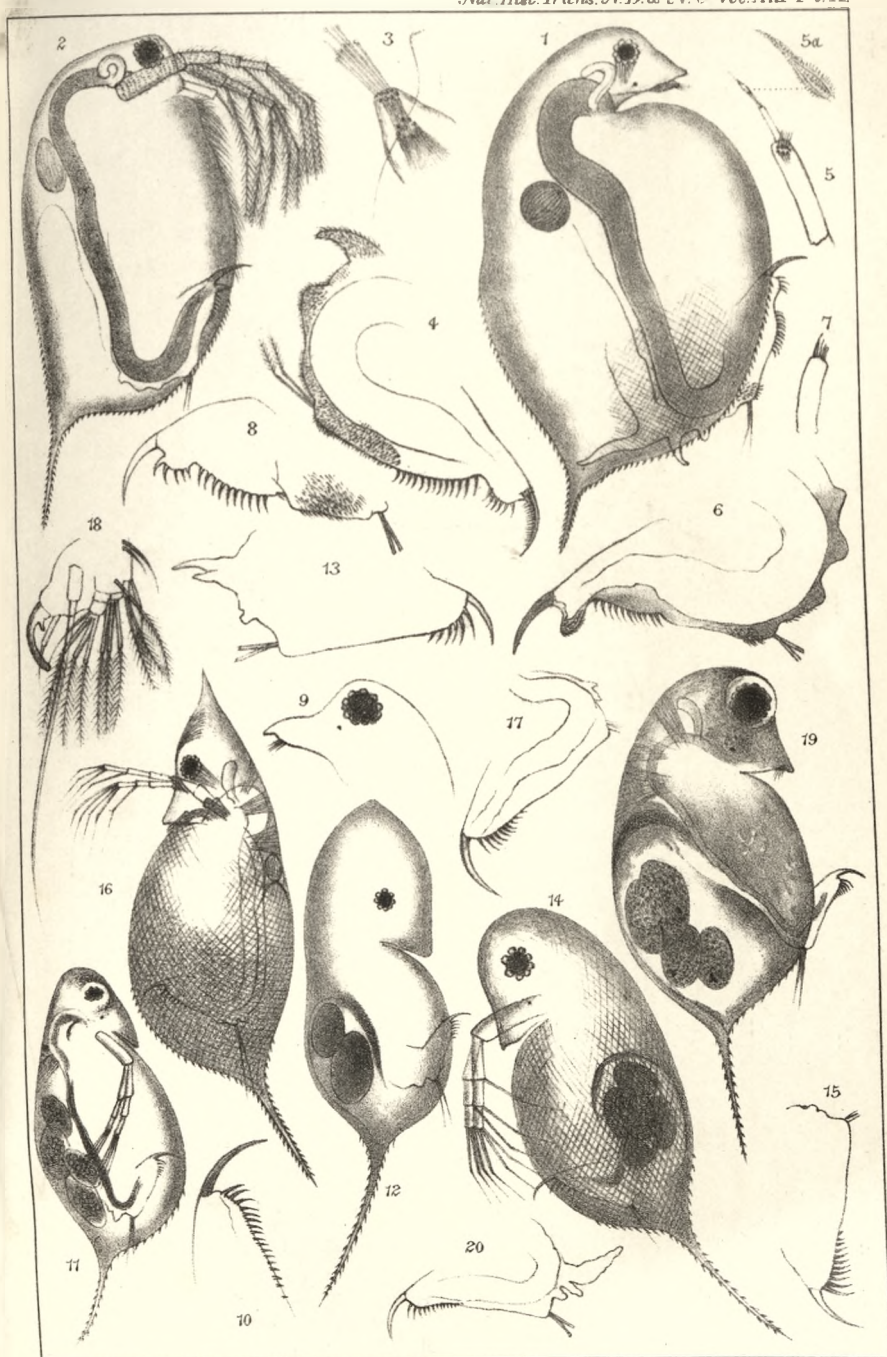


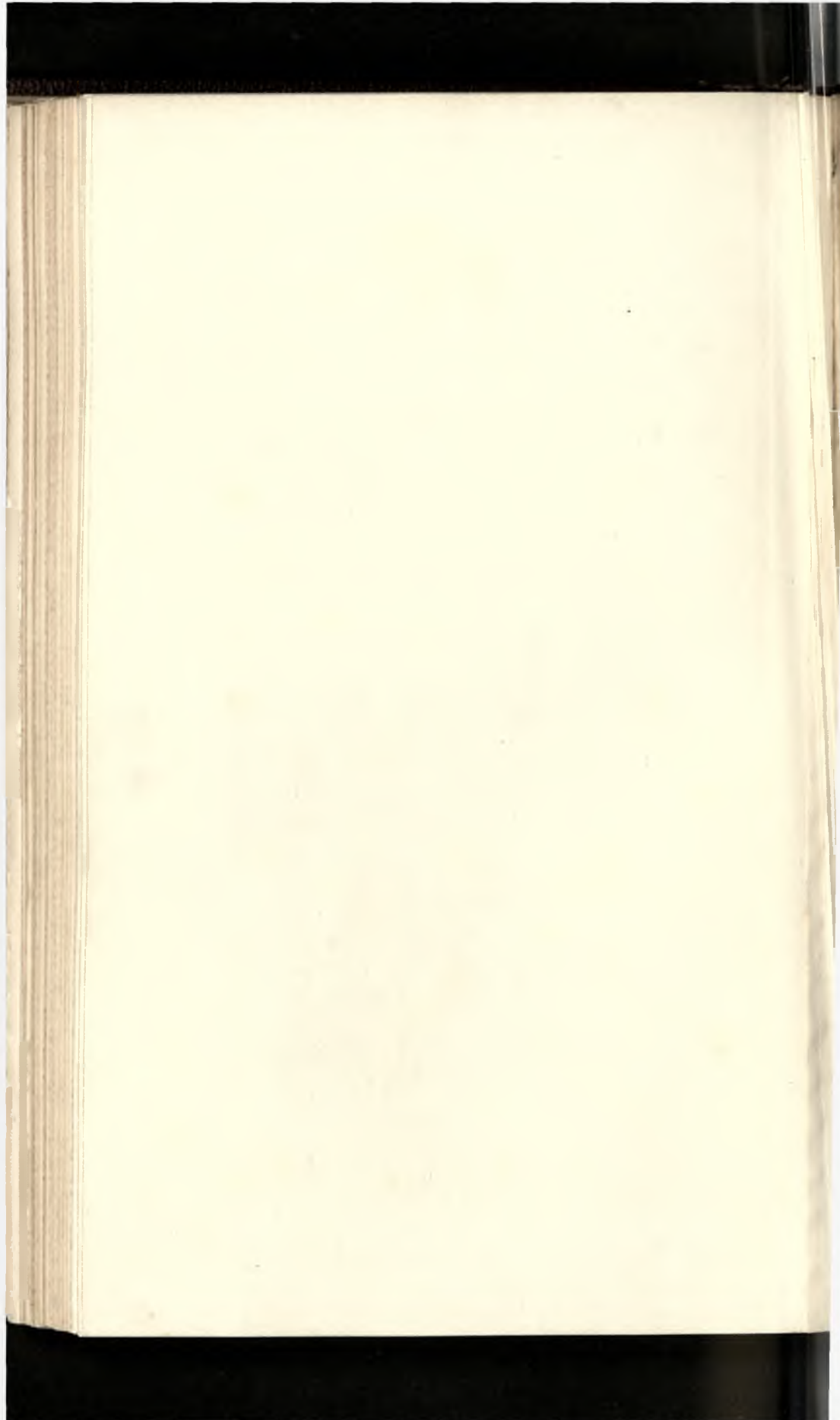












NATURAL HISTORY SOCIETY

OF

NORTHUMBERLAND, DURHAM, AND NEWCASTLE-
UPON-TYNE.

ANNUAL MEETING, 14TH JULY, 1897.

REPORT OF THE COMMITTEE FOR 1896-97.

At the end of another financial year the Committee of the Natural History Society have to report that the work of the Society has gone on quietly and with the usual regularity. The most important item in the deliberations of the Committee has been the proposal to so alter and enlarge the Rules of the Society that a Class of Associates may be admitted, who, at a reduced fee, would have the privilege and benefit of consulting the collections of the Society. Though it cannot be expected that the admission of Associates at a reduced rate of subscription will much increase the funds of the Society, yet if it tends to promote the study of Natural History in the district, one of the objects and aims of the Society will be attained. This proposed enlargement of the Rules of the Society will be more fully detailed in a subsequent paragraph.

The attendance at the Museum has been much the same as in past years, the state of the weather during the public holidays influencing the attendance at those times in a most remarkable manner. But it may be mentioned here that many young people have visited the Museum for the purpose of studying the interesting groups of Birds in the Central Room; among these have been a number of the Art Students of the College of Science, to

whom the beautiful and naturally-mounted specimens have been of great service and have supplied subjects of much value, proof of which could not fail to be observed in the numerous drawings and designs which attracted so much attention at the Annual Exhibition of their work. In order to afford additional facilities to those Students wishing to work in the Museum, a regulation has been adopted by the Committee by which Students of the College who wish to have the privilege of using the Museum collections are required to sign their names in a book on entering the Museum.

The net increase of members during the year has been small, and the receipts from subscribers less than in former years, leaving more subscriptions unpaid at the present time.

HANCOCK PRIZE FUND.—It was mentioned in last Report that the subscriptions to this Fund had been invested in the name of the Trustees of the Society in Newcastle Gas Stock. The cost of £70 Stock amounted to £164 : 5 : 0, and the balance of the subscriptions was ordered to be deposited in Post Office Savings Bank. This balance, with interest on Stock, now amounts to £12 : 16 : 0, available, after deduction of advertisement expenses, for award in prizes, if Essays of sufficient merit are sent in on or before July 31st next.

ASSOCIATES.—At the Committee Meeting in March a letter was read from a deputation of young men who wished to become connected with the Natural History Society as Associate Members. After a long and careful consideration of the question and an interview with the deputation, the Committee agreed to give the matter their immediate attention, and a Sub-Committee was appointed to consider and report on this question to the next meeting of the Committee.

REPORT OF THE SUB-COMMITTEE.

The Sub-Committee beg to report as follows:—

1. The election of Associates (other than members of the Tyne-

side Naturalists' Field Club) should be restricted to the children of members residing with their parents, or under the age of 21; and to such other persons as in the opinion of the proposer or seconder are not able to pay the subscription of ordinary membership.

2. Each such Associate to be elected for such period as the Committee shall determine, and the Committee shall at any time have power, if they think fit, to take the name of any Associate off their books at the expiration of the financial year.

3. The annual subscription of Associates should be five shillings per annum.

4. Every person desirous of becoming an Associate must be recommended in writing by two Ordinary Members, one of whom must certify to his personal knowledge of the candidate.

5. After there are twelve Associates elected under these regulations, each nomination may be signed by one ordinary member and two Associates.

6. Rule 4 should be amended by the insertion of the word "Ordinary" before members (line 2).

7. The Committee might authorise the supply of Transactions to Associates at cost price.

8. The access of Associates to the Library should be under the control of the Committee, and the more valuable books should be kept under lock and key.

If the above suggestions be confirmed your Sub-Committee also suggests that the Secretaries be instructed to prepare such amendments to the present Rules as will be required to carry out these alterations, and to call a Special General Meeting to discuss the proposed New Rules in anticipation of the General Annual Meeting. If such New Rules meet with the approbation of the members of such Special General Meeting the Committee suggest that any candidates qualified as Associates under such Rules be put up for election at such Special General Meeting pending the Annual Meeting of the Society.

A Special General Meeting of the members of the Society was summoned to be held on the second Wednesday, 12th May, for

the purpose of laying the above Report before the members, and due notice was given that the above Report and suggested alteration of the Rules of the Society would be proposed and considered.

The Special General Meeting was held in the Library on May 12th, the Rev. Principal Gurney in the chair. Mr. W. A. Watson-Armstrong gave notice of his intention to move at the next Annual Meeting, to be held on July 14th, an alteration of the Rules of the Society as follows :—

PROPOSED ADDITION TO THE LAWS OF THE NATURAL
HISTORY SOCIETY.

Rule 11a. Children of members residing with their parents or under the age of 21 years, and such persons as in the opinion of their proposer and seconder are unable to pay the subscription of ordinary membership, may be elected Associates of the Society for such period as the Committee may determine.

Rule 11b. Every person proposed for election as an Associate under Rule 11a must be recommended in writing by two ordinary members, one of whom must certify to his personal knowledge of the candidate and of his complying with the conditions of such Rule, but after twelve Associates shall have been elected under the preceding Rule, a recommendation for the election of an Associate thereunder may be signed by one ordinary member and two Associates.

Rule 11c. Any person recommended under Rule 11b shall be declared to be elected by the votes of the majority of members present either at a Committee Meeting, an Ordinary Meeting, or a Special Meeting of the Society.

Rule 12. By the addition of the words "or Associate" after "Member" in line one.

Rule 16. By the addition of "or Associate" after "Member" in lines one and four.

Rule 16a. The Committee shall have power at any time to call upon any Associate elected under Rule 11b to allow himself to be nominated for the ordinary membership of the Society,

failing which he shall cease to be an Associate of the Society at the end of the current financial year of the Society.

CONDITION OF THE MUSEUM BUILDING.

It will be evident to the members that a large building like the Museum needs constant attention and repairs to keep it in proper order, and a certain sum of money must necessarily be spent annually for this purpose. The condition of the East Corridor and Stair Case seems to call for immediate attention, and also the interior of the Wall Cases in the first room require to be repainted as soon as a sum of money can be spared for that purpose.

OBITUARY NOTICE.—Among the loss of members during the year we have to record the death of the last of the Hancock family of Natural History fame in the person of our late member, Miss Mary Jane Hancock, who died in her 87th year on the 28th of November, 1896. She was the sole survivor and younger sister of Albany and John Hancock, those brothers who were distinguished by the cultivation of several branches of Natural History whereby they signally enlarged the bounds of science. Miss Hancock had spent a long, quiet and amiable life in promoting the domestic happiness of her brothers and following pursuits congenial to their own. Botany and landscape painting were favourite subjects with her up to the last year of her life, and she left behind a considerable Herbarium of British plants and numerous Portfolios of sketches of rural and marine scenery from every place she visited in England and Scotland. She dwelt chiefly among her own people and did good, and died regretted by many friends who knew best the course of her retired and amiable life.

Miss Hancock left a legacy of £100 to the funds of the Society, which amount, less duty, has been received by the Hon. Treasurer and has been carried, by order of the Committee, to capital account.

Upon the application of the House Governor of the Royal Victoria School for the Blind for any duplicate specimens of Birds, etc., for the purpose of giving lessons and the instruction of the inmates of that Institution, the Committee have had the pleasure of complying with this request, and have presented a small collection of duplicate Birds and two or three Quadrupeds to the School for teaching purposes.

The most important donations and additions to the Museum during the past year have consisted of valuable books presented to the Library or received in exchange with Foreign Societies. The residuary legatees of the late John Hancock presented forty-nine volumes of works, chiefly Ornithological, from the Library of our late member, all of which are desirable works in a Reference Library. D. O. Drewett, Esq., of Riding Mill, presented eighteen volumes of the Philosophical Transactions, dating from the first volume in 1665 to 1800, together with eight quarto volumes of Memoirs and twenty octavo volumes of Monographs published by the Ray Society. Other works on Natural History of great value have been received from the Smithsonian Institution, the Geological Survey of the States, and the Museum of Comparative Zoology, Harvard College, Cambridge, United States of America, in exchange—altogether the additions amount to about two hundred volumes and parts of volumes of Transactions.

The Ornithological collection has been increased by donations of about twenty interesting Birds from Mr. George E. Crawhall, Mr. John Duncan and others. The Society has also received from the Executors of the late John Hancock several Stuffed Birds, Heads of Roe-deer and Gazelle, and Models of Falcons and Woodpeckers, which are now arranged in the Museum. Admiral Henry J. Carr, formerly of Whickham, presented a large collection of Ferns, collected chiefly in the southern parts of South America, consisting of about 300 carefully-named species of these interesting plants.

A full list of the donations is appended at the end of this Report.

The following is a list of the new members elected during the year July, 1896—June, 1897 :—

Wm. J. Bellerby, 4, Kensington Terrace, Newcastle.

John L. Gracie, 11, Sydenham Terrace, Newcastle.

George Jenkins, 6, Kensington Terrace, Newcastle.

Rev. John Walker, Whalton Rectory.

Right Rev. Edgar Jacob, D.D., Bishop of Newcastle.

Miss Hoyle, 16, Jesmond Road, Newcastle.

Lieut.-Col. Chas. H. E. Adamson, North Jesmond, Newcastle.

Mrs. Richardson, South Ashfield.

J. D. Robinson, Beaconsfield, Coatsworth Road, Gateshead.

Henry Piper, 2, Millfield Terrace, Gateshead.

Mrs. K. H. Stratton, 15, Portland Terrace, Newcastle.

THE HONORARY TREASURER IN ACCOUNT

Dr.

CURRENT ACCOUNT FROM 30TH JUNE'

		RECEIPTS.			£	s.	d.
1896.							
July 1.	To Balance from last Account				120	9	7
1897.							
June 30.	„ Members' Subscriptions				258	1	0
	„ Admission Fees				161	15	9
	„ Interest on Stock :—						
	Newcastle Corporation, 3½ per cent.						
	Stock (less Income Tax)	£67	13	4			
	Wear Commissioners, 4½ per cent.						
	Stock (less Income Tax)	21	15	0			
	Tyne Commissioners' Consolidated						
	Fund at 4 per cent. (less Income						
	Tax)	77	6	8			
					166	15	0
	„ Miss Hancock's Legacy, £100, less duty				90	0	0
	„ Guides to Museum sold				4	9	6
	„ Discount (Tradesmen's Accounts).....				0	4	8

£801 15 6

WITH THE NATURAL HISTORY SOCIETY.

1896, TO 30TH JUNE, 1897.

Cr.

1897.	PAYMENTS.	£	s.	d.	£	s.	d.
June 30.	By Salaries and Wages:—						
	Richard Howse	200	0	0			
	Joseph Wright	100	0	0			
	Wm. Vout	67	12	0			
	Albert Spencer	54	12	0			
	Mrs. Atkinson	26	0	0			
					448	4	0
	„ Incidental Expenses:—						
	Coal	8	3	3			
	Coke	17	0	0			
	Gas	5	3	4			
	Water	4	2	6			
	Advertisements	1	8	10			
	Taxes	6	17	2			
	Insurances	23	3	0			
	Electric Lighting	10	16	6			
					76	14	7
	„ Tradesmen's Accounts:—						
	Dinning & Cooke	3	15	0			
	Gurney & Jackson	1	10	0			
	John Bell & Co.	3	16	6			
	G. G. Laidler	27	19	8			
	Walker & Son	0	19	6			
	J. Jackson	8	2	0			
	Sopwith & Co.	1	1	0			
	Robson & Sons	2	2	0			
	Adw. Reid & Co.	1	8	0			
					50	13	8
	„ Sundries:—						
	Books—Fred. Raine	3	4	0			
	„ Sars' Crustacea	1	15	6			
	Johnson's Lichen Flora	0	13	2			
	Museums Association	1	1	0			
	Cheque Book	0	10	0			
	Disbursements—J. Wright	16	16	5			
					24	0	1
	„ Balance as per Bank Book				202	3	2
					£801	15	6

THOS. THOMPSON,

HON. TREASURER.

Examined and found correct.

SAM. GRAHAM,	} AUDITORS.
E. O. REID,	

THE HONORARY TREASURER IN ACCOUNT

Dr.	CAPITAL ACCOUNT,
1896.	£ s. d.
July 1.	To Invested in Newcastle Corporation Irredeem-
	able Stock at $3\frac{1}{2}$ per cent., as per last Capital
	Account 2000 0 0
	,, Invested in River Wear Commission Funded
	Debt at $4\frac{1}{2}$ per cent., as per last Capital
	Account..... 500 0 0
	,, Invested in Tyne Commissioners Consolidated
	Fund at 4 per cent., as per last Capital
	Account..... 2000 0 0
	<u>£4500 0 0</u>

FITTING ACCOUNT,

1896.	£ s. d.
July 1.	To Balance from last Account
	109 0 6

£109 0 6

WITH THE NATURAL HISTORY SOCIETY.

30TH JUNE, 1897.

CR.

1897.	£	s.	d.
June 30. By Newcastle Corporation Irredeemable Stock at 3½ per cent., as per Certificate No. 260	2000	0	0
„ River Wear Commission Funded Debt, No. 967, at 4½ per cent.	500	0	0
„ Tyne Commissioners Consolidated Fund at 4 per cent., Mortgage No. 5948	2000	0	0

 £4500 0 0

THOS. THOMPSON,
HON. TREASURER.

Examined and found correct.

SAM. GRAHAM, }
E. O. REID, } AUDITORS.

30TH JUNE, 1897.

1896.	£	s.	d.
Aug. 28. By F. W. Rich	26	1	6
1897.			
Feb. 12. „ Robson & Sons	32	10	0
June 30. „ Balance in Bank Book	50	9	0
	£109	0	6

THOS. THOMPSON,
HON. TREASURER.

Examined and found correct.

SAM. GRAHAM, }
E. O. REID, } AUDITORS.

OFFICERS OF THE NATURAL HISTORY SOCIETY, 1897-98.

The following Members are proposed as Officers of the Society for 1897-98, viz. :—

PRESIDENT.

Lord Armstrong, C.B., F.R.S.

VICE-PRESIDENTS.

The Earl of Ravensworth.
 Sir Lowthian Bell, Bart., F.R.S.
 Sir Andrew Noble, K.C.B., F.R.S.
 Sir M. W. Ridley, Bart., M.P.
 The Mayor of Newcastle.
 R. R. Dees, Esq.
 D. Embleton, Esq., M.D.
 D. O. Drewett, Esq.
 Joseph W. Swan, Esq.
 H. N. Middleton, Esq.
 Alex. S. Stevenson, Esq.
 W. A. Watson-Armstrong, Esq.
 W. D. Cruddas, Esq., M.P.

E. J. J. Browell, Esq.
 Prof. G. S. Brady, M.D., F.R.S.
 I. G. Dickinson, Esq.
 John A. Woods, Esq.
 G. H. Philipson, Esq., M.D.
 John Daglish, Esq.
 Rev. Canon Norman, F.R.S.
 George E. Crawhall, Esq.
 Rev. Principal Gurney, D.C.L.
 Norman Cookson, Esq.
 J. F. Spence, Esq.
 R. Y. Green, Esq.

HON. TREASURER.

Thomas Thompson, Esq.

HON. SECRETARIES.

A. H. Dickinson, Esq. | Prof. M. C. Potter, M.A.

COMMITTEE.

H. T. Archer.
 R. C. Clephan.
 Samuel Graham.
 Lieut.-Col. Chas. H. E. Adamson,
 C.I.E.I.
 Prof. G. R. Murray, M.D.
 N. H. Martin.

John Pattinson.
 John Philipson.
 W. M. Pybus.
 Bryan Cookson.
 Alexander Meek.
 J. D. Walker.

AUDITORS.

Samuel Graham. |

E. O. Reid.

HONORARY CURATORS,

1897-98.

ZOOLOGY.

VERTEBRATA.

D. Embleton, M.D.
Samuel Graham.
Geo. E. Crawhall.

Thomas Thompson.
Alexander Meek.

INVERTEBRATA.

Rev. Canon Norman, F.R.S.
N. H. Martin.
Alexander Meek.

Prof. Wm. Somerville.
Lient.-Col. Chas. H. E. Adamson,
C.I.E.

BOTANY.

Rev. H. E. Fox, London.
Rev. Wm. Johnson.
J. Bidgood, B.Sc.

Prof. M. C. Potter.
C. E. Stuart.

GEOLOGY.

E. J. J. Browell.
J. Daglish.
E. J. Garwood.
Dr. Gurney.

J. W. Kirkby.
Prof. G. A. Lebour.
Jno. Pattinson.

CURATOR OF MUSEUM.

Richard Howse.

KEEPER OF MUSEUM BUILDING.

Joseph Wright.

LIST OF EXCHANGES AND DONATIONS TO THE MUSEUM
AND LIBRARY

OF

THE NATURAL HISTORY SOCIETY,

FROM JULY 1ST, 1896, TO JUNE 30TH, 1897.

AMERICAN SOCIETIES.

UNITED STATES OF AMERICA.

Boston :—Society of Natural History.

Proceedings, Vol. 27, pp. 7-74; 75-199; 201-218; 219-241; 243-330.

Boston :—American Academy of Arts and Sciences.

Proceedings, New Ser., 23, 1896.

Cambridge :—American Academy of Arts and Sciences.

Proceedings, Vol. XXXII., Nos. 1-14.

Memoirs, Vol. XII., Nos. 2, 3.

The Academy.

Cambridge :—Museum of Comparative Zoology, Harvard College.

Memoirs, Vol. XX., XXI., XXII.

Report on Dredging in Gulf of Mexico.

Oceanic Ichthyology.

Bulletin, Geol. Ser., Vol. 28, Nos. 2, 3.

Bulletin, Vol. 29, Nos. 4, 5, 6.

„ „ 30, Nos. 1, 2, 3, 4, 5, 6.

Annual Report of the Curator. 1895-96.

Prof. Alex. Agassiz.

Chicago :—Academy of Sciences.

39th Annual Report. Jan., 1897.

Lichen Flora of Chicago and Vicinity. April, 1896.

The Academy.

Minneapolis, Minn.

Minnesota Botanical Studies.

In Exchange.

New York :—Academy of Science and Lyceum of Nat. History.

Transactions, Vol. XV., 1895-6.

Annals, Vol. 9, Nos. 1, 2, 3, 4, 5.

Index, Vol. VIII.

The Academy.

Philadelphia :—Academy of Natural Sciences.

Proceedings, Parts 1, 2, 3. 1896. Part 1, 1897.

The Academy.

Philadelphia:—American Philosophical Society.

Transactions, Vol. 18, Part 3, and Vol. 19, Part 1.

Proceedings, Vol. 35, No. 150.

,, ,, 35, ,, 151.

,, ,, 35, ,, 152.

*The Society.**Rochester, N.Y.:—Academy of Science.*

Proceedings, Vol. 3, Brochure 1, 1896.

*The Academy.**Salem:—American Association for Advancement of Science.*

Proceedings, 44th Meeting, Springfield, Mass., 1895.

,, 45th ,, Buffalo, N.Y., 1896. *The Association.**Washington:—Smithsonian Institution: Bureau of Ethnology.*

13th Annual Report, 1891-92.

Washington:—Smithsonian Institution: Contributions to Knowledge.

Reports for 1894:—

1034. Atmospheric Actinometry. 1896.

1035. Mountain Observations—America and Europe. 1896.

1038. Smithsonian Physical Tables. 1896.

1039. Virginia Cartography. 1896.

1071. Air and Life. 1896.

1072. The Atmosphere in relation to Human Life and Health.
1896.

1073. The Air of Towns. 1896.

1075. The constants of Nature, Part 5. Recapitulation of Atlantic
Weights. 1897.1077. Equipment and Work of an Aerophysical Observatory.
1897.

Vol. XXX., Oceanic Ichthyology.

,, XXXI., Life Histories of North American Birds.

,, XXXII., ,, ,, ,, Plates.

Miscellaneous Collections:—

Method of determining the Organic Matter in Air.

Index to the General Species of Foraminifera. C. D. Sherborn.
Part 2, No. 3.

Hodgkin's Fund.

"Argon," by Lord Raleigh and Prof. Wm. Ramsay.

Title Page to Vol. XXV.

*The Institution.**Washington:—Smithsonian Institution, U.S. National Museum.*

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“ “ “ 2nd ed. 1893.

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Lieut.-Col. Chas. H. E. Adamson, C.I.E.I.

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Les Oiseaux Hybrides rencontrés à l'état sauvage par André Suchetet.

Dennis Embleton, M.D.

Diagram of the Leblanc Soda Process, with Key, by J. J. Miller.

J. J. Miller, Gateshead.

Rotateurs des Environs de Genève.

Dr. E. F. Weber, Geneva.

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Drewett O. Drewett, Esq., Riding Mill-on-Tyne.

Temminck's Manual d'Ornithologie, 2 vols.

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Macgillivray's British Birds, 5 vols.

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Notes on European Ornithology, Lord Lilford.

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Catalogue of Birds in the Asiatic Society's Museum.

Jerdon's Birds of India, 3 vols.

Catalogue of Birds in the Indian Museum, 2 vols.

Hand-List of Genera and Species of Birds in the British Museum, George Grey.

Birds, Fishes, etc., Belfast Lough, Patterson.

Lowe's Fishes of Madeira.

Latham's Falconry.

Monograph of the Great Auk, 4to, Symington Grieve.

Gurney's Diurnal Birds of Prey.

„ Raptorial Birds in the Norwich Museum. Part 1.

Donovan's Insects, 14 vols.

Presented by the late John Hancock's Residuary Legatees.

Amongst the Birds of the Farne Islands. Rev. Arthur Morris.

Presented by C. Harrison, Esq.

MAMMALS.

Portion of Skull of White-beaked Dolphin, *Lagenorhynchus albirostris*, Gray.

Dug out of a sandhill on the coast. *Geo. Bolam, Esq., Berwick.*

Two Noctules or Great Bat, *Vespertilio noctula*.

Two small Bats, The Pipistrelle, from Ross, Herefordshire.

F. V. Wallis, Esq., Cloughton House, Ross.

Young Otter, *Lutra vulgaris*, caught on the Tweed.

Geo. Bolam, Esq., Berwick.

The Great Dormouse, *Myoxus glis* (L.), caught in Corsica by F. Raine.
Lived several years in captivity, died April, 1897.

Fred. Raine, Esq., per Mrs. Hay.

BIRDS.

Young Cuckoo killed against a window at Gosforth.

Armorer Hedley, Esq., Mayfield.

Pintail, *Dafila acuta*, ♂, Two Shovellers, *Spatula clypeata*, ♂ ♀, young of the year, Mallard; *Anas boschas*, ♂, summer plumage.

Two Golden Eye Ducks, *Clangula glaucion*, ♂ ♀. ♂ nearly mature, ♀ mature, all shot near Haydon Bridge. *Geo. F. Crawhall, Esq.*

Fifteen Skins of British Birds, two Nests of Weaver Bird, and two Skins of the Stoat or Ermine. *Wilfred Hall, Esq., Tynemouth.*

Herring Gull, dark variety, with a pure white feather in each wing.

Herring Gull, nearly mature.

Dunlin.

Sanderling.

Pigmy Curlew.

Richardson's Skua, very dark variety.

Herring Gull in mature winter plumage.

All shot at St. Mary's Island.

Mr. John Duncan.

Parra Jacana, from St. Fe de Bogata.

Mr. Richard Howse.

An Indigo-Finch and a Ribbon-Finch (cage birds).

Mrs. Ward, 1, Osborne Avenue.

Two specimens of *Aquila fulvescens*, Gray, from India, stuffed by Mr John Hancock; one Nutteracker, *Nucifraga caryocatactes*, kept alive for several years by Mr. John Hancock; two Rose-coloured Starlings, *Pastor roseus*, killed in the neighbourhood of Newcastle and Gateshead; one Song Thrush, *Turdus musicus*, killed at Oatlands; Head of Roe Deer from Scotland and Head of Gazelle preserved by Mr. John Hancock; one Marinosette; one small Shrew from Yorkshire.

Model of Gorged Falcon.

A Model of Falcon, the first made by J. Hancock, which was cast in silver for the Duke of Leeds.

A Cast in Metal of two Green Woodpeckers by John Hancock.

Bequeathed by Mr. John Hancock.

A Skin of the Common Scoter.

Mr. Wm. Charlton, Gosforth.

Jackdaw, ♂, with brown feathers in wings and tail, shot at Beaufront Castle, Hexham, May 11th, 1897.

Mr. Andrew Robson.

A pale variety of the Song Thrush, shot near Wooler Cottage, April 19th.

Mr. John P. Harle, per Mr. W. M. Pybus.

Two Guillemot's Eggs from Flambro' Head, one pure white and one tinted green.

J. Lawrence, Esq., 50, Hunters Road, Birmingham.

Egg of the Albatross from Antipodes Island, taken January, 1892.

Miss Rosamund A. St. John, Stokesfield, Thornbury, Glost.

REPTILES.

Two Vipers taken at Billsmoor Park near Elsdon.

N. F. Clark, Esq., Hexham.

Sloughed Skin of Common Snake, Ross, Herefordshire.

F. V. Wallis, Esq., Cloughton House, Ross.

FISHES.

Two fine specimens of the Gudgeon, three of the Ruff or Pope, *Acerina cernua*, two of the Bleak, *Leuciscus alburnus*, and one Perch, *Perca fluviatilis*.

Chas. Blamcy, Esq., 43, Banbury Road, Summerstown, Oxford.

Specimen of the Great Pipe-fish, *Syngnathus acus*, caught in the Tyne near St. Peter's, May 18th, 1897.

Mr. Thos. Curry.

INSECTS, ETC.

Specimen of the Sawfly, *Sirex gigas*. *G. B. Forster, Esq., Farnley Hill, Corbridge-on-Tyne.*

Larva of Deaths Head Sphinx, found feeding on potato leaves in a garden near Hexham.

Mr. Jas. Forster, Fore Street, Hexham.

Deaths Head Moth taken on a crane at Tynemouth Pier.

„ Larva found in a potato field, Monkseaton. *Mr. John Duncan.*

A specimen of the Small Copper, *Polyommatus Phlæas* var. *Schmidtii*, caught a little north of Newcastle.

Miss Annie Rossie.

Specimen of a Locust, living, brought in a box of oranges from the Continent.

Mr. Andrew Slee, Green Market.

Specimen of Locust brought in a fruit box from Continent.

Mr. W. A. Adams, Chronicle Office.

CRUSTACEA.

A fine specimen of *Lithodes Maia* caught at Whitley.

Dr. Jeaffreson.

MOLLUSCA, ETC.

Collection of Marine Shells from Natal and E. Africa.

Henry C. Burnup, Esq., Maritzburg, Natal.

Fine specimen of *Filograna implexa*, dredged off Whitley.

Mr. W. Storey, Cullercoats.

BOTANY.

A large Herbarium of Ferns, chiefly from the South parts of South America, comprising more than 300 species, in portfolios.

Admiral Henry J. Carr, U. Service Club, London.

ETHNOLOGY.

Fine Arrow- or Spear-heads of remarkable workmanship, made out of bottle glass by the natives of Western Australia. *Fred. Page, Esq., M.D.*

Facsimile of a Water-Wheel used in Jebeu in the Malay Peninsula, for irrigation purposes. *The Hon. C. Lambton, Major 5th Fusiliers.*

MINERALS AND FOSSILS.

A specimen of *Anthracosia ovalis*, Mant. sp.? in shale above Brockwell Scam, Broomhill, Acklington Colliery. *Mr. Algernon Noble.*

Some specimens of rock from vitrified fort at Craig Phadrick, Inverness.

Mr. Geo. Irving.

Deposit from Shaft of Burradon Colliery of Carb. baryta? etc., formed on a nail in about thirty years.

Mr. Peter Stewart, Hazlerigg Colliery, Gosforth.

Two specimens of Barytes and some Calc-Spar from veins in Stanhope Burn, Durham. *Mr. Wm. Powell, Stanhope.*

Some specimens of Iron Ore and Calc-Spar from Marbilla, Andalusia, Spain. *Capt. Gilbert Howse.*

Four examples of artificial Sulphur recovered from Soda waste.

Alfred C. Allhusen, Esq.

Fine specimens of crystallized Sulphur from Girgenti, Sicily.

Capt. Gilbert Howse, Cullercoats.

XIV.—Index-Catalogue of the Birds in the Hancock Collection, presented by deed of gift, 1st Nov., 1883, to the Trustees of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne, by John Hancock. By RICHARD HOWSE, M.A.

THIS unique and unrivalled Collection of British Birds, preserved by John Hancock and presented by him to the Museum of the Natural History Society, and now known as the "Hancock Collection," was made, as nearly as can be ascertained between the years 1828 and 1890, close up to the time of Mr. Hancock's death. It will be seen by the notes appended to each Bird in the Catalogue that the Collection was acquired by Mr. Hancock's own personal collecting during his long life—by gifts from his friends and correspondents—by exchange with other collectors and, in some instances, by purchase.

It was about the former period (1828) that Mr. Hancock began to stuff Birds, some examples, (as the Golden Plover and others) of that date, being still shewn in the Museum. From his early years Mr. Hancock was a personal friend and acquaintance of Thomas Bewick, the celebrated wood engraver,* whose admirable woodcuts adorn his work on British Birds—and also of R. R. Wingate, who was at that time a friend of Bewick's and the best Bird-stuffer in Newcastle. Without doubt, the intimacy and influence of these lovers of Birds had much to do in fostering and increasing Hancock's enthusiasm in these early years of his life and studies. But he soon departed from the methods and practices of the early Bird-stuffers and gradually developed a plan of his own based essentially on a study of the anatomy and habits of the Birds, that one after another came under his notice, assisted by the strong artistic power which was inbred and natural to him and which in course of time shewed itself in the unrivalled manner that most or all of his groups of Birds are set up.

* Most of the original Drawings of these Engravings adorn the walls of the front room Gallery of the Museum.

Though Mr. Hancock had previously done many Birds and groups of Birds both for himself and for private friends in the neighbourhood, it was not till 1851 that he ventured to send for exhibition, to the building of the Crystal Palace in Hyde Park, London, his celebrated groups of Falcons and Heron, intended to illustrate the sport of Falconry in ancient times—the Lämmergeyer of the Alps and a few other smaller groups of Gulls and dead Game. It was not till this time that his artistic power in preserving Birds became known generally to the public of his native town and remoter parts of Great Britain.

The Eagle and Swans originally intended for the Paris Exhibition of 1861, but not sent there, and exhibited for some time at the Crystal Palace at Sydenham, is the largest group that Mr. Hancock attempted. In this group all the bones of the head, wings, and feet of the two prominent Birds are entirely removed and their places modelled in. Several other Birds in the Collection are treated in the same manner. The groups of Falcons and Gyrfalcons in the Wall-cases are, perhaps, some of the finest examples of Mr. Hancock's artistic power, and study of the habits of these noble Birds. The Falcon and Raven and several groups of dead Game may also be classed with his masterpieces, and the group of Reeve's Pheasants, one of the last of the large groups, was done in 1882.

With few exceptions the Collection is arranged according to "Hancock's Catalogue of the Birds of Northumberland and Durham." * Most of the local Birds mentioned in it form the chief part of the Collection. The species not resident or not found in the Northern Counties are represented as far as possible by British killed specimens, but a few foreign Birds are introduced occasionally to illustrate different states of plumage. Only two species have been added since Mr. Hancock's death, namely, the Ruffed-Bustard shot near Marske-by-the-Sea, and a specimen of the Sooty-Shearwater shot near Newbiggin-by-the-Sea.

Among the Palmipedes many additions have been made since 1892, as this was the part of the Collection left most incomplete

* Natural History Transactions of Northumberland, Durham and Newcastle-upon-Tyne, vol. VI., 1874.

by Mr. Hancock. The recent additions have been contributed to the Museum chiefly by the following friends of the Society, namely, Messrs. Bryan Cookson, George E. Crawhall, Thomas Thompson, J. C. Maling, John Duncan, W. E. Beck, John Jackson and others. All these Birds have been carefully prepared and set up by John Jackson, formerly assistant with Mr. Hancock at the Museum. These will be carefully indicated in the Catalogue and also one or two others not done by Mr. Hancock.

The words *left, centre, right, upper, middle, lower, etc.*, after the small numbers indicate the position of the Birds in each case from the observer's point of view. These words are followed by short notes referring to each individual Bird in the case, recording as far as possible, the age, state of plumage, time and place of capture and by whom obtained, with explanatory remarks by Mr. Hancock when they were thought necessary.

INDEX-CATALOGUE.

CLASS. AVES.

ORDER. ACCIPITRES.

Family. VULTURIDÆ.

Genus. *NEOPHRON*.

CASE

1. Egyptian Vulture. *Neophron percnopterus*,
(Linn.).

No. 1 (left). YOUNG in first plumage.

„ 2 (right). MATURE.

India.

Presented by W. E. Brooks, Esq.

From Old Museum Collection.

Fam. FALCONIDÆ.

Genus. *AQUILA*.

2. Golden Eagle. *Aquila fulva*, (Linn.).

MATURE FEMALE.

Scotland, May, 1853.

Remarks.—Eggs belonging to this bird are in the adjoining cabinet. The bones have all been removed from this specimen. J. Hancock.

3. Golden Eagle.

MATURE MALE.

Caithness, May 3rd, 1879.

Re-stuffed by J. Hancock, 1881.

4. Golden Eagle.

MATURE MALE.

Trapped in Scotland, May 5th, 1877.

Presented by George E. Crawhall, Esq., Oct., 1885.

CASE

5. Golden Eagle.

MALE, in first plumage.

Denmark, J. Hancock, 1870.

6. Spotted Eagle. *Aquila nævia*, Brisson.

No. 1 (left). First plumage.

India.

Presented by W. E. Brooks, Esq., 1878.

,, 2 (right). MATURE.

Belgrade.

From Old Museum Collection.

*Genus. HALIÆTUS.***7. White-tailed Eagle. *Haliæetus albicilla*, (Linn.).**

No. 1 (left). MATURE FEMALE.

Orkney, 1865.

,, 2 (right). MATURE MALE.

Orkney, 1865.

Stuffed by T. Bates. From Old Museum Collection.

,, 3 (centre). Downy state.

Purchased.

8. White-tailed Eagle.

No. 1. MALE in first plumage.

Trapped in Scotland, March 26th, 1878.

*Presented by George E. Crawhall, Esq., Oct., 1885.***9. White-tailed Eagle.**

No. 1. First plumage.

Shot near Morpeth, Jan., 1830.

*Presented by John Moore, Esq.**Stuffed by R. R. Wingate. From Old Museum Collection.**Genus. PANDION.***10. Osprey. *Pandion haliaëtus*, (Linn.).**

No. 1 (upper). MALE in first plumage.

Caught at sea, 1856.

,, 2 (lower). FEMALE in first plumage.

Shot near Morpeth, Oct. 9th, 1830.

From Old Museum Collection.

CASE

11. Osprey.

No. 1 (centre). MATURE FEMALE.

Shot at the nest in Glen More, April 18th, 1850.

Remark.—The nest and two eggs of this specimen are in the adjoining cabinet. J. H.

No. 2 (right). MATURE MALE.

Shot at Newburn-on-Tyne, near Newcastle, May, 1838.

„ 3. (left). FEMALE in first plumage.

Shot near Heworth, 1841.

J. Hancock.

Genus. *BUTEO*.

12. Common Buzzard. *Buteo vulgaris*, Willughby.

No. 1 (upper left).

Shot at Alston, Jan. 9th, 1844.

„ 2 (upper right). MALE.

Shot at Alston, May, 1844.

„ 3 (lower left). FEMALE.

Caught in a trap at Ravensworth, Feb., 1837.

„ 4 (lower right). FEMALE. Dark variety.

Remarks.—This bird (No. 4) lived in confinement from 1835 till March 1844. In 1835 the iris was pale lead colour, when it died the iris was dark hazel. J. H.

13. Common Buzzard.

No. 1 (left). MALE.

Washed up by the sea on Whitburn Sands, March 26th, 1856.

See Nat. Hist. Trans., vol. VI., p. 5.

„ 2 (right). FEMALE.

Cumberland, Dec., 1836.

J. Hancock.

Genus. *ARCHIBUTEO*.

14. Rough-legged Buzzard. *Archibuteo lagopus* (Brünn).

No. 1 (left). MATURE FEMALE.

Bishop Auckland,

CASE

Remark.—Remains of a Stoat was in its stomach when it was shot. J. H.

No. 2 (right). FEMALE.

Shot at Ugthorpe, near Whitby, Nov. 3rd, 1875.

Presented to J. Hancock by Thos. Vaughan, Esq. J. H.

15. Rough-legged Buzzard.

No. 1 (right). IMMATURE.

Germany, 1833.

„ 2 (left). MATURE MALE.

Alston, Cumberland, Nov. 6th, 1839.

Remark.—The bones were taken out of this specimen (No. 2) and the flesh cleaned off. The bones were covered with tow and put in again. This is the only bird in the collection I have done on this plan. J. Hancock.

Genus. *PERNIS.*

16. Honey Buzzard. *Pernis apivorus*, (Linn.).

No. 1 (left). MATURE MALE. Dark complexion.

Washed up on Whitburn Sands, Aug. 27th, 1835.

See Nat. Hist. Trans., vol. VI., p. 6.

„ 2 (right). MATURE FEMALE. Pale complexion.

Shot at Beadnell, Northumberland, Aug. 18th, 1832. J. H.

17. Honey Buzzard.

No. 1 (left). MATURE MALE. Pale complexion.

Stuffed 1847.

„ 2 (centre).

Shot at Howick, Northumberland, about Sept. 22nd, 1864.

Received from Earl Grey.

Remark.—The bones have been removed from this specimen. J. H.

No. 3 (right). First plumage.

Found dead at Catterick, Yorkshire.

Received from Mr. Edwd. Wood, Richmond. J. Hancock.

CASE

18. Honey Buzzard.

No. 1 (left). First plumage. Dark complexion.

Walbottle, Northumberland, summer of 1831.

„ 2 (centre). First plumage. Dark complexion.

Blagdon, Northumberland, Sept. 19th, 1839.

„ 3 (right). First plumage.

Chester-le-Street, about the year 1830. J. H.

19. Honey Buzzard.

No. 1 (left). Dark complexion.

Found by J. Hancock on Blyth Sands, Sept. 22nd, 1841. Mr. C. M. Adamson was in company with me at the time. See Nat. Hist. Trans., vol. VI., p. 6.

„ 2, 3 (right). Two young birds, having just left the nest. Newbiggin, near Hexham, 24th Aug., 1841. See Nat. Hist. Trans., vol. VI., p. 6. J. Hancock.

Genus. MILVUS.

20. Kite. *Milvus regalis*, Brisson.

No. 1 (left). MATURE FEMALE.

Cardiff, Wales, April 14th, 1853.

Remark.—Two eggs and nest belonging to this bird in the adjoining cabinet. J. H.

No. 2 (right). YOUNG in first plumage.

British specimen.

21. Black Kite. *Milvus ater*, (Gmel.), *niger*, Briss.

No. 1. MATURE MALE.

Caught in a trap in the Duke of Northumberland's Park, Alnwick, May, 1867. See Nat. Hist. Trans., vol. VI., p. 9.

Remarks.—First British-killed specimen on record. J. Hancock.

CASE

Genus. *FALCO*.

22. Greenland Falcon. *Falco gyrfalco*, Linn.

Var. *Grœnlandicus*, = *candicans*, Gmel.

No. 1 (left). MATURE MALE.

Remark.—Received alive from Edinburgh, Jan., 1842. It was caught on the Leith coast; when obtained was in first plumage. Died Sept. 1st, 1842.

No. 2 (right). First plumage. Dark complexion.

Received from Arch. Cochrane, Esq.

23. Greenland Falcon.

No. 1 (left). MALE in first plumage.

Davis Straits, Oct., 1843. Capt. Taylor.

„ 2 (right). Ptarmigan, *Lagopus mutus*.

Davis Straits, 1843.

24. Greenland Falcon.

No. 1 (upper centre). FEMALE in first plumage.

Lat. 67°, Davis Straits, Sept. 25th, 1835. Capt. Warham.

„ 2. (right). IMMATURE. Shewing both first and second plumage feathers.

Remark.—This specimen was caught in a trap in Argyle-shire, March, 1876. After its death presented to John Hancock by Major Fisher, Sept. 17th, 1876. From this specimen the bones have been removed. J. H.

No. 3 (left). MALE in first plumage. 1855.

„ 4 (lower centre). MALE in first plumage.

Davis Straits, 1835. Capt. Taylor.

25. Greenland Falcon.

No. 1 (left). MATURE MALE. Plumage once changed.

From Greenland, 1858.

„ 2 (centre). MATURE FEMALE.

Bought in London, 1853.

No. 3 (right). MATURE MALE. Plumage once changed.

From Greenland, 1858.

CASE

26. Greenland Falcon.

No. 1. MATURE FEMALE.

Shot in Davis Straits, 1835.

Presented to John Hancock by Captain Taylor.

27. Greenland Falcon.

No. 1 (left). MATURE MALE.

Shot in Greenland, Feb., 1852.

,, 2 (centre). MATURE MALE.

Shot in Iceland, in the winter of 1838.

,, 3 (right). MATURE FEMALE.

From Iceland, 1843.

28. Greenland Falcon.

No. 1 (left). MALE in first plumage.

North Greenland, 1852.

,, 2 (right). FEMALE in first plumage.

Received from Denmark, 1849.

29. Iceland Falcon. *Falco gyrfalco*, Linn.Var. *Islandicus*, Brisson.

No. 1 (left). MATURE FEMALE.

South Greenland, 1848.

,, 2 (centre). MATURE MALE.

Presented alive by His Grace the Duke of Leeds
to John Hancock, August 28th, 1847.

,, 3 (right). MATURE MALE.

Iceland, 1844.

,, 4 (front left). Downy state. Iceland, 1846.

30. Iceland Falcon.

No. 1 (upper centre). MATURE MALE.

South Greenland, 1852.

,, 2 (right). MATURE FEMALE.

South Greenland, 1852.

,, 3 (left and centre). Downy state. Two males and one
female.

Brought from Iceland by Wm. Proctor in 1853.

CASE

31. Iceland Falcon.

No. 1. MALE IMMATURE. Variety with white feathers.

Remark.—Probably a cross between Greenland and Iceland Falcon. Killed in Iceland, 1840. J. H.

32. Iceland Falcon.

No. 1 (left). MALE in first plumage.

North Tyne, Jan. 20th, 1845.

„ 2 (centre). MALE in first plumage.

Normanby, Yorkshire, March, 1837.

„ 3 (right). FEMALE in first plumage.

Shot at Liefle, Davis Straits, Oct., 1839.

33. Iceland Falcon.

No. 1. FEMALE in first plumage.

Iceland, 1844. Wm. Proctor, Durham. J. H.

34. Iceland Falcon.

No. 1 (left). MATURE MALE.

„ 2 (right). MATURE FEMALE.

„ 3 and 4 (centre). Young of 1 and 2.

Remarks.—All shot at the nest in Iceland in 1837 by Wm. Proctor, Durham. J. H.

35. Norwegian Falcon. *Falco gyrfalco*, Linn.

No. 1 (left). FEMALE in first plumage.

Finland, 1854.

Presented by J. Wolley.

„ 2 (right). MATURE FEMALE.

Shot at the nest in Lapland, 24th April, 1857.

Presented by J. Wolley, 1858.

„ 3 (centre). MALE. First moult nearly complete.

Taken in Holland, 1850.

Presented by the Duke of Leeds to John Hancock in a living state in July, 1850. Died in Feb., 1851.

CASE

36. Saker Falcon. *Falco gyrfalco*, Linn.Var. **Sacer**, Brisson.

No. 1 (left). FEMALE in first plumage.

Remark.—Caught in the rigging of a ship crossing the Mediterranean between Alexandria and Candia, Jan., 1845. Received this bird alive. J. H.

No. 2 (right). MATURE FEMALE.

Hungary.

Presented to J. Hancock by A. Cochrane, Esq.

No. 3 (centre). YOUNG in the down.

Hungary, 1847.

Received March, 1849.

Remark.—These specimens are placed in the collection only to show the Eastern form of the four large, true Falcons.

**37. Peregrine Falcon. *Falco peregrinus*, Gmelin
ex Brisson.**

No. 1 (left). MATURE FEMALE.

Shot by Charles St. John, Esq., at Gordons-
town, Moray, April 22nd, 1851.

,, 2 (right). MATURE MALE.

Shot on the same day and place as the
female by Charles St. John, Esq.

38. Peregrine Falcon.

No. 1 (left). MATURE MALE. Dark complexion.

Caught at sea, 1836.

,, 2 (left centre). MATURE FEMALE.

Scotland, 1852. Shewing the coloration of the
East Indian so called *F. peregrinator*.

,, 3 (right). MATURE MALE.

South-east Coast of Scotland, 1842.

Remark.—This was a trained bird, in the possession of John Hancock from Jan., 1844, until Dec., 1845, when it was shot by mistake.

CASE

No. 4 and 5 (front centre). Downy state.

„ 6 (right centre). *F. peregrinator*. FEMALE.

Fattegurh district, India.

Received this specimen from W. E. Brooks, Esq.,
Nov. 16th, 1870.

Remark.—This specimen is placed here for comparison with the European *F. peregrinus*. I think it to be the Indian race of that species. John Hancock.

39. Peregrine Falcon.

No. 1 (left), MALE in first plumage.

Stranraer, N.B., Jan. 26th, 1883.

Presented by Mr. Galbraith.

„ 2 (centre). FEMALE in first plumage.

Hartley Bates, Northumberland, Sept. 22nd, 1852.

„ 3 (right). MALE in first plumage.

Shot at Hepple, on the Coquet, Nov., 1883.

Presented by Capt. A. Noble, R.A.

40. Peregrine Falcon.

No. 1 (left). MATURE FEMALE.

Cumberland, March, 1838.

„ 2 (right). MATURE MALE.

Scotland.

Died in the Edinburgh Zoological Gardens, 1848.

41. Peregrine Falcon.

No. 1 (left). MATURE FEMALE.

Captured off Cape Farewell, 1836.

„ 2 (right). MATURE MALE.

Captured off Cape Farewell, 1839.

Received No. 2 from Capt. Taylor.

42. Merlin. *Falco æsalon*, Gmelin, ex Brisson.

No. 1 (left). MATURE MALE.

Northumberland, March 18th, 1833.

CASE

No. 2 (left-centre). YOUNG in first plumage.

„ 3 (right-centre). MATURE MALE.

St. John's, Weardale, Oct. 21st, 1875.

Presented to J. Hancock by H. Duberley, Esq.

„ 4 (right). MATURE FEMALE.

Northumberland, 1840.

„ 5 (lower-centre). MATURE, worn plumage.

Summer, 1840.

„ 6 (lower-centre). Downy state.

Wolsingham, July 19th, 1840.

43. Merlin.

No. 1. MATURE MALE, in full flight.

44. Hobby. *Falco subbuteo*, Linn. ex Ray.

No. 1 (left). MATURE MALE.

„ 2 (right). MATURE FEMALE. Belongs to nest with three young.

„ 3 (centre). Three young, down and first feather.

Remarks.—The nest was taken with the old female at Normanby, Surrey, 1880.

Received from Capt. F. H. Salvin, Feb. 7th, 1881.

45. Hobby.

No. 1 (left). MALE, young.

Remark.—Bought at Leadenhall Market with another, both in the down, July, 1843. This bird was trained. This specimen, with a body made of wax, is the only bird in the collection done on that plan. J. H.

No. 2 (centre). MATURE FEMALE.

Shot on the Town Moor, Newcastle, about 1851.

„ 3 (right). MATURE MALE.

France, 1844.

Received from J. Hardy, Dieppe.

46. Red-legged Hobby. *Falco vespertinus*, Linn.

No. 1 (left). MATURE FEMALE.

Shot on the Thias, Hungary, 1850.

Presented to J. H. by A. H. Cochrane, Esq.

CASE

No. 2 (upper-centre). MATURE MALE.

Shot on the sea-banks between South Shields and Marsden, Oct., 1836.

No. 3 (lower-centre). First plumage.

Mediterranean, 1850.

„ 4 (right). MALE, changing plumage.

Remark.—Obtained the specimen (No. 2), Oct., 1863, from Mr. Clarke, South Shields. J. H.

47. Kestrel. *Falco tinnunculus*, Linn. ex Will.

No. 1 (left). MALE in first plumage.

Northumberland, 1835.

„ 2 (centre). MATURE FEMALE, with blue tail.

Wolsingham, May 8th, 1876.

„ 3 (right). MATURE FEMALE.

Northumberland, 1837.

„ 4 (centre). Downy state.

Sweden, 25, 6, 1882.

No. 4, presented to J. H. by Mr. Bidwell.

Genus. ACCIPITER.

48. Sparrow Hawk. *Accipiter nisus*, (Linn.).

No. 1 (left). MATURE MALE. Variety without bars on the breast feathers.

Tyneside, 1854.

„ 2 (upper-centre). MATURE MALE.

Northumberland, 1843.

„ 3 (lower-centre). MATURE FEMALE.

Northumberland, 1843.

„ 4 (right). MALE, young, in first plumage.

Genus. ASTUR.

49. Goshawk. *Astur palumbarius*, (Linn.).

MALE and FEMALE in first plumage.

Holland.

Remark.—Received in the flesh from Capt. F. H. Salvin, Aug., 1844. J. H.

CASE

50. Goshawk.

- No. 1. MALE. Nest plumage much worn.
Kielder, Northumberland, Oct., 1849.
(See specimens in Case 49).

51. Goshawk.

- No. 1. MATURE MALE.
Received from Capt. F. H. Salvin, Dec. 8th, 1843.
Remark.—This was a trained bird, two years old. J. H.

52. Goshawk. (In large adjoining Case).

- No. 1 (left front). Downy state.
Carlsbad, Germany, June, 1840.
,, 2 (left). MATURE FEMALE.
Hulne Park, Alnwick.
Presented by Ralph Carr. Esq., 1862.
Re-stuffed by J. Hancock, 1883.
From Old Museum Collection.
,, 3 (right). MATURE MALE.
The Doune, Rothiemurchus, N.B., April 8th, 1850.
Obtained in the flesh by J. Hancock.

*Genus. CIRCUS.***53. Hen Harrier. Circus cyaneus, (Linn).**

- No. 1 (left). MATURE FEMALE.
Stamfordham, Northumberland, Dec. 21st, 1833.
,, 2 (right). MATURE MALE.
Northumberland, 1833.

54. Hen Harrier.

- No. 1 (left). MATURE MALE.
Northumberland, 1836.
,, 2 (right). FEMALE, young in first plumage.
Cheviot, February 12th, 1835.
Presented to J. H. by Mr. John Laws.

CASE

55. Montague's Harrier. *Circus cineraceus*,
(Montague).

No. 1 (left). MATURE MALE.

Morpeth Common, July, 1829.

,, 2 (centre). MATURE FEMALE.

,, 3 (right). MATURE FEMALE.

Trapped on Lorbottle Moor by John Anderson,
Gamekeeper, about 1858.

No. 3. Presented to Nat. Hist. Society by

Edmund Crawshay, Esq., 1884.

56. Montague's Harrier.

No. 1 and 2 (left and centre). YOUNG in first plumage.

Bred in Wolsingham Park, 1835.

(See Catalogue of Birds of Northumberland and
Durham, p. 20).

,, 3. MALE. Dark variety.

Northumberland, 1835.

57. Marsh Harrier. *Circus æruginosus*, (Linn.).

No. 1 (left). MALE.

North of England, 1830.

Remark.—Stuffed by R. R. Wingate; altered a little by
J. Hancock, 1883. J. H.

No. 2 (centre). FEMALE. A moulting bird.

Lartington, Aug. 15th, 1840.

,, 3 (right). FEMALE, first plumage.

Bought alive with two others all from one nest.

Bought in Leadenhall Market, July, 1881.

58. Marsh Harrier.

No. 1 (left). MALE.

Mogul Serai, India, 12th Feby., 1875.

,, 2 (centre). MATURE FEMALE.

,, 3 (right). MALE. First plumage.

From Muddapore, India, Feb. 13th, 1881.

W. E. Brooks, Esq.

59. Empty Case.

CASE.

Fam. STRIGIDÆ.

Genus. *SURNIA*.60. Snowy Owl. *Surnia nyctea*, (Linn.).

No. 1 (left). FEMALE.

North Uist, 1884.

Presented by Sir John Campbell Ord. Bart.,

Stuffed in Edinburgh.

February 17th, 1885.

,, 2 (centre). MATURE MALE.

Stuffed by J. Hancock in 1844.

,, 3 (right). First plumage, showing some down on head
and breast.

Bought of J. Green in London, December, 1847.

61. Snowy Owl.

No. 1 (left). MALE.

North America.

,, 2 (right). FEMALE.

Falls of Niagara.

Received 1837.

Genus. *BUBO*.62. Eagle Owl. *Bubo maximus*, Fleming.

No. 1. FEMALE.

Sweden.

From Old Museum Collection.

63. Eagle Owl.

No. 1. MATURE FEMALE.

1876.

Stuffed 1884. J. Hancock.

64. Eagle Owl.

No. 1. MATURE MALE.

Shot on the Volga, Russia, 1863.

Stuffed 1884 by J. Hancock.

Genus. *OTUS*.65. Short-eared Owl. *Otus brachyotos*, (Forster).

No. 1 (left).

Taken on a ship in the North Sea, Sept., 1836.

Presented to J. H. by Capt. Warham of the

"Lord Gambier" Whaler.

,, 2 (right).

Northumberland, 1836.

CASE.

66. Short-eared Owl.

No. 1 (lower left). Sex not determined.

„ 2 (upper left). MALE.

„ 3 (upper right). MALE.

„ 4 (lower right). Sex not determined.

Remark.—All the four birds in this Case were shot at one time at Ugthorpe, Yorkshire, 1876.

Presented to J. H. by Mrs. Vaughan.

67. Long-eared Owl. *Otus vulgaris*, Fleming.

No. 1 (left). Stuffed about 1840.

„ 2 (centre). First plumage.

From Old Museum Collection.

„ 3 (right).

Scotland, June, 1885.

Presented by John Jackson.

Genus. SCOPS.

68. Scops Owl. *Scops Aldrovandi*, Willughby.

No. 1 (left). MATURE.

Foreign specimen.

„ 2 (right). MATURE.

Foreign specimen.

Remark.—The bones have been entirely removed from this individual. J. H.

No. 3 (front). Skeleton of No. 2.

Genus. NOCTUA.

69. Little Owl. *Noctua minor*, Brisson.

No. 1 (upper centre).

From Old Museum Collection.

„ 2 (right).

From Old Museum Collection.

„ 3 (left). First plumage.

Belgium.

Presented by A. B. Percival, August, 1892.

CASE.

No. 4 (lower centre).

Remark.—This bird from Belgium was kept for some time alive in the Museum. Ed.

Nos. 3 and 4 Stuffed by J. Jackson.

Presented by A. B. Percival, 1893.

Genus. NYCTALE.

70. Tengmalm's Owl. Nyctale Tengmalmi,
(Gmelin).

No. 1 (left).

Shot near Rothbury, 1849.

Presented to J. Hancock by Clement Lister, Esq.

„ 2 (right).

Shot near Whitburn, Oct. 11th or 12th, 1848.

Remark.—Both stuffed from fresh specimens by J. Hancock.

Genus. SYRNIUM.

71. Tawny Owl. Syrnium aluco, (Linn.)

No. 1 (left). FEMALE.

Shot in Westmorland, Jan. 1st, 1883.

Presented by Mrs. Henry Watson.

„ 2 (centre). First plumage.

„ 3 (right). FEMALE.

Netherwitton, July, 1853.

Presented to J. Hancock by C. M. Adamson, Esq.

Genus. STRIX.

72. Barn Owl. Strix flammea, Linn.

No. 1 (left).

Lumley, 1832.

Presented to J. Hancock by Ed. Smith.

„ 2 (right). Group of Barn Owls in full sunlight.

1. FEMALE.

Norfolk, 1888.

Presented by Wm. Voutt.

2. Dark variety unusual in Britain, 1840.

CASE.

ORDER. PASSERES.

Fam. PICIDÆ.

*Genus. PICUS.*1. Greater Spotted Woodpecker. *Picus major*,
Linn.

No. 1 (centre). First plumage.

Cleadow, Co. Durham, 1880.

Presented by Henry C. Abbs, Esq.

,, 2 (left). MALE.

British specimen, 1846.

,, 3 (right). FEMALE.

Benton, near Newcastle, Dec., 1886.

*Presented by Mr. Edwin Bold.*2. Lesser Spotted Woodpecker. *Picus minor*,
Linn.

No. 1 (upper left). MALE.

Guildford, Feb. 9th, 1879.

Presented by Capt. Salvin.

,, 2 (centre). FEMALE.

South of England, April, 1847.

,, 3 (lower left). MALE.

South of England.

,, 4 (upper right). MALE.

Gosforth Park, 1841.

,, 5 (lower right). First plumage.

Found dead at Oatlands, June, 1867.

Presented by W. C. Hewitson, Esq.

*Genus. GECINUS.*3. Green Woodpecker. *Gecinus viridis*, (Linn.).

No. 1 (centre). FEMALE.

Wolsingham, 1874.

Presented by H. Duberly, Esq.

,, 2 (right). MALE.

,, 3 and 4 (left). First plumage.

Northamptonshire, 1843.

Presented by H. W. Wheelwright, Esq.

CASE.

Genus. *YUNX*.4. Wryneck. *Yunx torquilla*, Linn.

No. 1 (left).

Northumberland, 1830.

,, 2 (centre).

Northumberland, 1830.

,, 3 (upper right).

St. Mary's Island, Autumn, 1833.

Shot by John Hancock.

,, 4 (lower right). Two in first plumage, 1840.

Fam. CUCULIDÆ.

Genus. *CUCULUS*.5. Cuckoo. *Cuculus canorus*, Linn.

No. 1 (left). MATURE. Sex not determined.

Wolsingham, Durham, May 10th, 1876.

Presented by H. Duberley, Esq.

,, 2 (flying). YOUNG in first plumage, 1843.

Presented to J. Hancock by James Burnett.

,, 3 (right). YOUNG in first plumage.

Northumberland, 1871.

Genus. *OXYLOPHUS*6. Great Spotted Cuckoo. *Oxylophus glandarius*, (Linn.).

No. 1.

Clintburn, near Bellingham, August 5th, 1870.

Presented by W. H. Charlton, Esq., Hesleyside.

Remark.—This is the only specimen recorded that has been killed in England to this date. J. H.

Fam. CORACIIDÆ.

Genus. *CORACIAS*.7. Roller. *Coracias garrula*, Linn.

No. 1 (left).

No. 2 (right).

Foreign specimen, Constantinople, 1864.

Presented by Thos. Robson.

CASE.

Fam. MEROPIDÆ.

Genus. MEROPS.

8. Bee Eater. *Merops apiaster*, Linn.

Nos. 1, 2, 3.

Constantinople, 1864.

Presented by T. Robson.

Fam. ALCEDINIDÆ.

Genus. ALCEDO.

9. Kingfisher. *Alcedo ispida*, Linn.

No. 1 (left). IMMATURE.

Ouseburn, Newcastle, previous to the year 1832.

,, 2 (centre). IMMATURE MALE.

Ouseburn, Newcastle, Nov., 1832.

,, (right). MATURE MALE.

Caught on the nest with the female at

Bishop Auckland, 1835.

Fam. UPUPIDÆ.

Genus. UPUPA.

10. Hoopoe. *Upupa epops*, Linn.

No. 1 (upper, flying).

Caught upon the rigging of a ship coming into
the Tyne about the year 1848.

,, 2 (left).

Shot on the coast between Cullercoats and Whitley
on the coronation day of King William, Sept.
4th, 1831, by Thos. Harvey in company with
J. Hancock.

,, 3 (right).

Found dead in the garden at Beadnell Tower,
Northumberland, Nov., 1895.

Presented by Alfred Allhusen, Esq., Beadnell Tower.

Stuffed by J. Jackson.

CASE.

Fam. CETHIIDÆ.

Genus. CETHIA.

11. Creeper. *Certhia familiaris*, Linn.

No. 1 (lowest). 1832.

,, 2 (left middle). Two YOUNG in first plumage.

Taken near Winlaton, June 12th, 1836.

Presented by Mr. T. Robson.

,, 3 (upper). MALE.

Shot at St. John's, Wolsingham, March 21st, 1876.

Presented by H. Duberly, Esq.

Genus. SITTA.

12. Nuthatch. *Sitta Europæa*, Linn.Var. *Cæsia*, Wolf.

No. 1 (upper centre). YOUNG in first plumage.

Killed against the drawing room window at
Oatlands, Surrey, June 22nd, 1872.

No. 2 (lower centre).

Shot at Bishop Auckland about 1832.

,, 3 (right). In full plumage.

British. Stuffed from a skin, Dec., 1878.

No. 4 (left). YOUNG.

Found dead near Riding Mill-on-Tyne,

Northumberland, Dec. 5th, 1892.

Stuffed by J. Jackson. Presented by John Duncan.

Fam. CORVIDÆ.

Genus. CORVUS.

13. Raven. *Corvus corax*, Linn.

No. 1. FEMALE.

Lerwick, Shetland, Oct. 31st, 1883.

Presented by Frederic Raine, Esq.

Stuffed by John Hancock, Nov., 1883.

Remark.—Other examples under an adjoining glass shade.

CASE.

14. Carrion Crow. *Corvus corone*, Linn.

No. 1 (lower left). First plumage.

South Tyne, Northumberland.

Presented by Mr. Richd. Howse.

,, 2 (upper left). FEMALE.

Findrissie, Scotland, March 16th, 1850.

,, 3 (right). MALE, 1836.

,, 4 (centre). YOUNG in first plumage.

June, 1877.

15. Hooded Crow. *Corvus cornix*, Linn.

No. 1 (left). MATURE.

Cuil-na-Shamraig, W. Loch Tarbert, Oct, 1879.

Presented by Mrs. Browell.

,, 2 (right). MALE.

Newbiggin-by-the-Sea, Jan. 26th, 1881.

*Presented by Mr. E. O. Reid.***16. Hooded Crow.**

No. 1 (front left). MALE.

Cross between Hooded and Carrion Crow.

Elgin, March 9th, 1850.

,, 2 (right). FEMALE.

Cross between Hooded and Carrion Crow.

Elgin, March 9th, 1850.

,, 3 (hind left).

Richmond, Yorkshire, 1838.

Remark.—For an account of this interesting cross see Catalogue of the Birds of Northumberland and Durham, (Nat. Hist. Trans. of Northumberland and Durham, vol. vi., p. 32). J. H.

17. Rook. *Corvus frugilegus*, Linn.

No. 1 (left). MALE in breeding plumage.

,, 2 (right). FEMALE in breeding plumage.

Northumberland March 25th, 1876.

Remark.—The latter with an egg in the ovary ready to be laid. J. H.

CASE.

18. Rook.

No. 1 (upper left). First plumage, variety. Durham.

„ 2 (upper right). MALE.

Presented by Mr. Losh, 1850.

„ 3 (lower right). First plumage, incomplete.

Wylam, May 3rd, 1888.

Presented by Wm. Dinning, Esq.

„ 4 (lower left). Early state of the Young.

Wylam, May 3rd, 1888.

Presented by Wm. Dinning, Esq.

19. Rook.

No. 1 (left). Young? Variety with grey marks.

„ 2 (right). „ „ „

Bought in a broker's shop at Weybridge, Surrey,
1880.

Remark.—This variety requires special attention. J. H.

„ 3 (centre). First plumage, with abnormal coloration of
the bill.

20. Jackdaw. *Corvus monedula*, Linn.

No. 1 (left). MALE. First plumage.

Oatlands, Surrey.

„ 2 (right). MATURE FEMALE.

Grinkle Park, Yorkshire, 1866.

„ 3 (centre). MALE.

Variety with white ring on neck, from Targashino,
Tems, Gowz Arrondess Kronsnojara, April 2nd,
1878.

Presented by Henry Seabohm, Esq.

Genus. CORACIA.

21. Chough. *Coracia gracula*, (Linn.).

No. 1 (left). MATURE.

Islay, Scotland.

Shot in the winter of 1878.

Presented to J. Hancock by R. Y. Green, Esq.

Remarks.—The bones have all been removed from this
specimen, and the bird is represented picking his own bones.

CASE.

No. 2 (right).

Shot at Redheugh near Berwick-upon-Tweed
about the year 1838.

Presented by Dr. George Johnson, Berwick.

Genus. *NUCIFRAGA*.

22. Nutcracker. *Nucifraga caryocatactes*, (Linn.).

No. 1 (left). FEMALE.

From the Valley of the Yenesei, E. Siberia, in lat.
63°, June, 1879.

Presented by Henry Seebohm, Esq.

„ 2 (right). MALE.

Rennesöe, Stavanger, Norway, Sept. 16th, 1844.

„ 3 (lower).

Thrush—killed against drawing room window,
Oatlands, Surrey, July 6th, 1880.

Genus. *PICA*.

23. Magpie. *Pica caudata*, (Willughby).

= *Pica rustica*, (Scop.).

No. 1 (left). Lorbottle.

„ 2 (right).

Lorbottle, Northumberland, about 1870.

Genus. *GARRULUS*.

24. Jay. *Garrulus glandarius*, (Linn.).

No. 1 (left). MALE.

Surrey, Dec. 19th, 1882.

Presented by Mr. Scott Wilson.

„ 2 (centre). FEMALE.

Wolsingham, March 24th, 1876.

Presented by Hy. Duberly, Esq.

„ 3 (right). MALE.

Near Ross, Herefordshire, June, 1893.

Presented by Fred. V. Wallis, Esq., Ross.

Stuffed by J. Jackson.

CASE

Fam. ORIOLIDÆ.

Genus. *ORIOLUS*.25. Golden Oriole. *Oriolus galbula*, Linnæus.

No. 1 (left). MALE. Received from France, 1844.

,, 2 (right). FEMALE.

Shot at Hebburn near Newcastle about the year 1831.

Fam. LANIIDÆ.

Genus. *LANIUS*.26. Great Grey Shrike. *Lanius excubitor*, Linn.

No. 1 (left). IMMATURE MALE.

Caught on lime wand twigs near South Shields,

Winter of 1837.

,, 2 (centre). MALE. Shot at Hebburn near Newcastle
by George Redhead, 1836.

,, 3 (right). FEMALE.

Shot near the Grand Stand on the Town Moor,

Newcastle, Oct. 18th, 1839.

27. Lesser Grey Shrike. *Lanius minor*, Gmelin.

TWO MALES. Received from M. L. Bunel of Dieppe

about the year 1840. Stuffed 1876.

28. Empty Case for Lesser Grey Shrike.

29. Woodchat Shrike. *Lanius rufus*, Linn.

No. 1 (left). First or nest plumage, from France, 1840.

,, 2 (right). MATURE MALE, in worn plumage.

30. Red-backed Shrike. *Lanius colluris*, Linn.

No. 1 (lower right). MALE.

,, 2 (upper left). FEMALE.

,, 3 (left). YOUNG, first plumage.

,, 4, 5 (centre). ,, ,,

Shot near Keswick, July 29th, 1840.

CASE

Remark.—The insects impaled on thorns by the birds themselves. J. H.

No. 6 (upper right). MALE. Shot at Horsley, May, 1834.
Presented by B. Mitford, Esq.

31. Empty Case for Red-backed Shrike.

Fam. STURNIDÆ.

Genus. STURNUS

32. Starling. *Sturnus vulgaris*, Linn.

No. 1 (left). MATURE MALE. Shot 1836.

„ 2 (centre). Shot January, 1873.

„ 3 (right). MATURE.

Shot in Summer of 1865, at Grinkle Park, Yorkshire.

33. Starling.

No. 1 (right). FEMALE, young, once moulted.

Shot at Eshott near Felton, June 15th, 1876.

Presented by Mr. Longstaff.

„ 2 (left). YOUNG, first plumage.

Cross House, Leazes, Newcastle.

Stuffed by J. Jackson.

Presented by E. O. Reid, Esq., June, 1892.

34. Starling.

No. 1 (left). MALE. Near Cullercoats, Sept., 1895.

„ 2 (right). Variety with white feathers on the head.

Kept in a cage three years, Monkseaton.

Both presented by J. Duncan, Dec. 22nd, 1895.

Stuffed by J. Jackson.

35. Case for Starlings in first plummage.

CASE

*Genus. PASTOR.***36. Rose-coloured Pastor. *Pastor roseus*, (Linn.).**

No. 1 (left). MALE, in full mature plumage, Mirzapore.

Presented by W. E. Brooks, Esq., 1867.

,, 2 (right). MALE, in worn plumage. Locality unknown.

37. Rose-coloured Pastor.

No. 1 (left). FEMALE. Shot at Rock, Northumberland,

by Mr. Smith, July 31st, 1832.

,, 2 (right). FEMALE. Shot by Chas. St. John, Esq.,

near Loch Spynie, Elgin, June 21st, 1851.

,, 3 (centre). MALE. Shot at Walbottle, 1836.

Remark.—All in this case are specimens with worn plumage. J. H.**38. Rose-coloured Pastor.**

No. 1 (left). Half changed from first plumage.

Bought at Liverpool, 1836.

,, 2 (centre). First plumage.

,, 3 (right). Second plumage—probably female.

Mirzapore, India.

Presented to J. Hancock by W. E. Brooks, 1862.

Fam. FRINGILLIDÆ.*Genus. PASSER.***39. House Sparrow. *Passer domesticus*, Brisson.**

No. 1 (lower left). MALE. Summer plumage, June, 1872.

,, 2 (upper left). MALE. Winter plumage, Dec. 1875.

,, 3 (upper centre). YOUNG. First plumage, June 1872.

,, 4 (right). FEMALE. June 19th, 1872.

Remark.—All shot at Oatlands.

No. 5 (lower centre). MALE. First plumage.

Remark.—See black on throat. Killed against the window at Oatlands, June 29th, 1887. J. H.

CASE

40. Tree Sparrow. *Passer montanus*, Brisson.

No. 1 (lower left). Northumberland.

„ 2 (upper left). Shot at the Rabbit Banks, Gateshead,
1831.

„ 3 (upper right). In first plumage.

Shot at Whitburn, Durham, by H. St. John, Esq.

„ 4 (lower right). FEMALE.

Shot at Shooting Match, near Newcastle,

Dec. 18th, 1886.

Stuffed and presented by John Jackson.

Genus. PYRRHULA.

41. Bullfinch. *Pyrrhula vulgaris*, Temminck.

No. 1 (centre). MALE. Killed near Newcastle, 1840.

„ 2 (upper right). YOUNG, first plumage.

Killed against Drawing Room Window

at Oatlands, Surrey, June 15th, 1872.

„ 3 (lower right). FEMALE (represented dead).

Killed against Drawing Room Window

at Oatlands, Surrey, July 4th, 1872.

„ 4 (left). MALE, in first plumage.

Killed against window at Oatlands, August 4th,

1885.

42. Bullfinch.

White variety. From Old Museum Collection.

Genus. CORYTHUS.

43. Pine Grosbeak. *Corythus enucleator*, (Linn.).

No. 1 (left). American specimen.

Received from Mr. Geo. Freeman about 1832.

„ 2 (right). MALE. Mr. Losh.

Genus. LOXIA.

44. Crossbill. *Loxia curvirostra*, Linn.

No. 1 (upper left). YOUNG from Nest.

Hesleyside, July, 1836.

CASE

No. 2 (lower left). First plumage.

Bred at Hesleyside, 1838.

„ 3 (centre). First plumage.

Kielder, North Tyne, 1839 (Watson).

„ 4 (upper right). FEMALE, changing from first plumage.

Shot at Hesleyside out of a flock, July, 1838.

„ 5 (lower right). MALE, changing from first plumage
to red. Shot out of a flock, August, 1838.

45. Crossbill.

No. 1 (left). FEMALE.

Shot in Dulcie Woods on the Findhorn, Scotland,
May 8th, 1850, by Charles St. John, jun., when
in the presence of his father and myself. J. Hancock.

Remarks.—It was feeding its young when shot. This
was the first time the nest was taken in Scotland, which is
now in my collection, of course empty, as the young had
left the nest. J. H.

No. 2 (centre). MALE, in second or red plumage.

This bird was shot in Scotland by Chas. St. John, 1849.

„ 3 (right). FEMALE. Shot near Elgin, Oct. 13th, 1849.

46. Crossbill.

No. 1 (left). MALE, in red plumage. Sweden, 1860.

Presented to J. Hancock by H. W. Wheelwright.

„ 2 (upper centre). MALE, in red plumage.

Northumberland, 1832.

„ 3 (upper right). MALE, changing from red to yellow.

Shot near Kirk Quam, Norway, 1833. J. Hancock.

„ 4 (lower centre). MALE.

Remark.—It changed from red to yellow when in C. M.
Adamson's possession. Died March, 1872. J. H.

No. 5 (lower right). MATURE FEMALE.

CASE

47. Parrot Crossbill. *Loxia pityopsittacus*,

Bechst.

No. 1 (lower left). MALE, red plumage, once changed.

Sept., 1859.

,, 2 (upper left). FEMALE YOUNG, in first plumage.

Remark.—All the above were killed in Wermland, Sweden, by H. W. Wheelwright, 1859.No. 3 (upper right). *Loxia Himmalayana* of Authors.

Young in first plumage from Sicklim.

Presented by W. E. Brooks, 1876.

Remark.—This specimen is put in this case to shew how the Races differ in size. J. Hancock.

No. 4 (lower right). FEMALE? Wermland, Sweden?

48. White-winged Crossbill. *Loxia bifasciata*,

(Brehm.).

No. 1 (left). Uima, Archangel, Dec, 1875.

,, 2 (centre). YOUNG. Archangel, June, 1875.

,, 3 (right). FEMALE.

Brampton, Cumberland, Nov., 1845.

Nos. 1 and 2 presented by W. E. Brooks, Esq., 1876.

49. White-winged Crossbill.

No. 1 (left). Newfoundland, 1841.

Presented to J. Hancock by Captain Taylor.

,, 2 (centre). North America.

Presented to J. Hancock by Capt. F. H. Salvin.

,, 3 (right). MALE. Bought in Newcastle.

*Genus. COCCOTHRAUSTUS.***50. Hawfinch. *Coccothraustus vulgaris*, Viellot.**

No. 1 (lower left). MALE, young in first plumage.

Shot June, 14th, 1875, at Hinckley, Leicestersh.

Presented to J. Hancock by Mr. J. Thompson.

CASE

No. 2 (upper left). MALE.

Taken near London, April 19th, 1868.

„ 3 (upper right) MALE.

Shot in Streatlam Park in the Winter of 1845.

Presented to J. Hancock by Mr. J. Dent.

„ 4 (lower right). FEMALE. Beaufront-on-Tyne.

Presented by Mr. A. Robson, Jan. 29th, 1889.

51. Hawfinch.

YOUNG.

Killed against a window at Riding Mill-on-Tyne.

Presented by John Duncan, June, 1896.

Stuffed by J. Jackson.

Genus. LIGURINUS.

52. Greenfinch. *Ligurinus chloris*, (Linn.).

No. 1 (lower left). MATURE MALE.

Killed against a window at Oatlands, Surrey,

July 8th, 1874.

„ 2 (upper left).

Killed against a window at Oatlands Surrey,

April 20th, 1874.

„ 3 and 4 (right). 1830.

Genus. FRINGILLA.

53. Chaffinch. *Fringilla cælebs*, Linn.

No. 1 (lower left). MALE.

„ 2 (upper left). FEMALE.

Shot at Lorbottle, March 29th, 1875.

Presented to J. Hancock by George Noble.

54. Mountain Finch. *Fringilla montifringilla*, Linn.

Nos. 1 and 2 (left). MALES.

Cullercoats, Feb. 13th, 1860.

CASE

No. 3 (upper right). Cullercoats, Feb. 13th, 1860.

„ 4 (lower right). MALE?

Was kept alive for two years. Died Feb., 1865.

Presented to J. Hancock by Capt. Harris.

Genus. CARDUELIS.

55. Goldfinch. *Carduelis, elegans*, Stephens.

Nos. 1, 2, 3 (left, centre). Kent, November, 1832.

No 4 (upper right). YOUNG?

Shot near Tanson, Northamptonshire, July, 1843.

„ 5 (lower right). Newbiggin-by-the-Sea, Feb., 1841.

Presented to J. Hancock by Mr. T. Robson

Genus. CHRYSOMITRIS.

56. Siskin. *Chrysomitris spinus*, (Linn.).

No. 1 (upper left). MALE.

„ 2 (upper right). MALE.

„ 3 (lower right). MALE.

„ 4 (lower left). FEMALE.

„ 5 (middle right). FEMALE.

Remark.—All these birds were shot at Bywell-on-Tyne,
March 5th, 1833, by J. Hancock.

57. Siskin.

No. 1 (right). MALE.

„ 2 (left). FEMALE.

„ 3 (centre). Nest and Young.

Taken at Loch Nabo, near Elgin, May 2nd, 1850,
by John Hancock.

58. Siskin.

First plumage.

Taken at Loch Nabo, near Elgin, May 2nd, 1850,
by John Hancock.

Remark.—I believe the Nest contained five young birds.

CASE
Genus *SERINUS*.

59. Serin Finch. *Serinus hortulanus*, Koch.

No. 1 (left). MALE. Bought in London, 1853.

„ 2 (right). MALE. Marseilles, 1839.

J. Richardson.

60. Hybrid between Greenfinch and Linnet.

No. 1. Caught by a bird-catcher at Kenton, near Newcastle, Dec. 24th, 1887. It lived in the Museum till Oct. 22nd, 1888. John Hancock.

Genus. *CANNABINA*.

61. Linnet. *Cannabina linota*, (Gmelin).

No. 1 (lower left). FEMALE (by dissection). Durham.

Presented to J. Hancock by Fred. Raine, Esq.

„ 2 (upper left). YOUNG, first plumage.

„ 3 (upper centre). MALE.

Remark.—This bird came into John Hancock's possession Dec. 17th, 1875. The red on the breast was scarcely visible. It died Jan., 1876. The red was then visible, the ends of the feathers having dropped off. J. H.

No. 4 (upper right). MATURE MALE, losing the red.

Presented to J. Hancock by Mr. Longstaff, Eshott.

„ 5 (middle right). MALE, in full red plumage.

Northamptonshire, July, 1843.

„ 6 (lower right). YOUNG, in first plumage.

Eshott, near Felton, July 13th, 1876.

„ 7 (lower centre). MALE (by dissection), with red on the breast at base of feathers.

Presented to John Hancock by Fred. Raine.

62. Mountain Linnet. *Cannabina flavirostris*,

(Linn.).

No. 1 (lower left).

„ 2 (upper left). Horsley, Reedwater, Northumberland,

Oct. 24th, 1832. B. Mitford, Esq.

CASE

*Genus. LINARIA.***63. Mealy Redpole. *Linaria borealis*, Viellot.**

No. 1 (left).

,, 3 (centre).

,, 4 (right). All three shot in Yorkshire, 1848.

Mr. Mark Booth.

,, 2 (upper left). MALE, in the red state. Durham.

Bought of W. Proctor, 1848.

64. Arctic Redpole. *Linaria canescens*, Gould.

No. 1 (left). MALE.

Shot at Ust Zilma, Lower Petchora, April 28th, 1875.

Collected by H. Seebohm and Harvey Brown, Esqs.

,, 2 (centre).

Knocked down with a clod of earth, April 24th,
1855, on the sea banks, near Whitburn, Durham.Presented to J. Hancock by the Rev. Geo. Cooper Abbs,
Cleadow.

,, 3 (lower right). MALE.

Shot at Ust Zilma, Lower Petchora, May 20th, 1875.

Collected by H. Seebohm and Harvey Brown, Esqs.

,, 4 (upper right). Shot in Iceland.

Obtained from W. Proctor, Durham.

Remarks.—This rag of a specimen is put in this case only to shew what takes place by the margins of the feathers wearing off after being exposed to the weather for a few months. J. H.**65. Lesser Redpole. *Linaria rufescens*, Viellot.**

No. 1 (lower left). MALE and FEMALE.

Shot in Northumberland. Stuffed about 1830.

,, 2 (upper left). Sex not determined.

Caught at the Nest, May, 1876.

,, 3 (right). MALE and FEMALE.

Caught at the Nest, May, 1876.

Nos. 2 and 3 presented to J. Hancock by

Thos. Thompson, Esq., Winlaton.

CASE

*Genus. EMBERIZA.***66. Black-headed Bunting. *Emberiza melanocephala*, Scop.**

No. 1 (left). MALE.

Salona Dal, from A. H. Cochrane, Esq.

,, 2 (right). MALE. Constantinople, 1864.

Received from Thos. Robson.

67. Common Bunting. *Emberiza miliaria*, Linn.

No. 1 (left). First plumage. Blaydon, June 22nd, 1875.

,, 2 (middle). FEMALE. Sherburn Hill, Nov., 1874.

,, 3 (right). MALE.

North Sunderland, March 13th, 1875.

Nos. 2 and 3 presented to J. Hancock by Fred. Raine.

68. Yellow Bunting. *Emberiza citrinella*, Linn.

No. 1 (left). MALE. Newcastle, about 1830.

,, 2 (middle). FEMALE. Newcastle, 1872.

,, 3 (right). MALE. Variety with red on cheeks.

Shot about 1848.

69. Hybrid between Yellow Bunting and Reed Bunting.

Caught at Whitley, near Newcastle, Jan. 30th, 1886,
and lived in a cage at the Museum until June 11th,
1887. Stuffed at Oatlands, by J. Hancock, June,
1887.

Remark.—I am of opinion that this bird is a natural cross
between the Yellow Bunting and the Reed Bunting

70. Cirl Bunting. *Emberiza cirlus*, Linn.

No. 1 (lower left). MALE.

Shot at Stoke-sub-Hambden, Somerset, Jan., 1853.

Presented to J. Hancock by Mark Beoth

,, 2 (upper left). MALE.

,, 3 (right). FEMALE.

Nos. 2 and 3 presented by Mr. Heysham

CASE

71. Ortolan Bunting. *Emberiza hortulana*, Linn.

No. 1 (left). MALE.

Marseilles, July, 1839. J. Richardson.

,, 2 (upper centre). FEMALE.

Marseilles, July, 1839. J. Richardson.

,, 3 (lower centre). MALE. Old Museum Collection.

,, 4 (right). FEMALE. Old Museum Collection.

Remark.—Male bird No. 3 figured by Bewick. J. H.**72. Little Bunting. *Emberiza pusilla*, Pallas.**

No. 1 (left). First plumage.

Yenesei, Siberia, July 29th, 1877. Henry Seebohm.

,, 2 (right). MALE? India. W. E. Brooks, 1876.

73. Reed Bunting. *Emberiza schoeniclus*, (Linn.).

No. 1 (left). MALE. Summer.

Northumberland about 1832.

,, 2 (upper right). MALE. Winter.

Shot at Prestwick Carr by J. Hancock, Sept., 1833.

,, 3 (lower right). FEMALE. Winter, Newcastle.

Nov., 1868.

*Genus. PLECTROPHANES.***74. Snow Bunting. *Plectrophanes nivalis*, (Linn.).**

No. 1 (lower left). FEMALE. Northumberland.

,, 2 (upper left).

Shot near Jesmond, Newcastle, Feb., 1872.

Presented by Mr. Joseph Adamson.

,, 3 (right). MALE. Shot at Alston, Nov., 1831.

75. Snow Bunting.

No. 1 (upper left). FEMALE.

In the worn plumage of Summer.

,, 2 (right) MALE. In worn Summer plumage.

Presented to J. Hancock by W. E. Brooks, Esq.,

Dec., 1876.

,, 3 (lower left). First plumage.

Yenesei, E. Siberia, July 20th, 1877,

CASE

76. Lapland Bunting. *Plectrophanes Lapponicus*, (Linn.).

No. 1 (upper left). MALE. Davis Straits, June 5th, 1837.

„ 1 (lower left). FEMALE. Davis Straits, 1835.

Captain Warham.

„ 2 (upper right). MALE. Davis Straits, 1839.

All the above in Summer dress.

„ 3 (lower right). First plumage.

Valley of the Yenesei, Siberia, in lat. 71°5',

July 20th, 1877.

Presented to J. Hancock by Henry Seebohm.

77. Lapland Bunting.

No. 1 (right). MALE. Winter plumage.

„ 2 (left). MALE. Winter plumage.

Both shot near Berwick-upon-Tweed, Jan., 1893.

Presented by George Bolam, Esq., Jan. 7th, 1893.

Fam. ALAUDIDÆ.

Genus. ALAUDA.

78. Skylark. *Alauda arvensis*, Linn.

No. 1 (lower left). MATURE. Northumberland, 1832.

„ 2 (upper left). MATURE. Northumberland, 1832.

„ 3 (upper right). FEMALE.

Found dead at Whittle Dene, April 17th, 1876,

by J. Hancock.

„ 4 (lower right). YOUNG.

Taken at Prestwick Carr, 1836, by J. Hancock.

79. Wood Lark. *Alauda arborea*, Linn.

No. 1 (left). Shot at Swalwell, March, 1844.

Presented by Thos. Robson.

Remark.—There were three in all killed. J. H.

No. 2 (right). FEMALE.

Shot at Hornby near Catterick, Yorkshire,

Jan. 4th, 1864, by Mr. Anthony Savage.

Remarks.—The stomach was filled with grain. J. H.

CASE

80. Crested Lark. *Alauda cristata*, Linn.

No. 1 (left). FEMALE.

Shot at Kadakoi, Turkey, Nov. 21st, 1863.

Received from Mr. Thos. Robson,
Constantinople, in 1864.

,, 2 (centre). MALE. Alexandria, March 30th, 1864.

Collected by S. S. Allen.

,, 3 (right). YOUNG, in first plumage.

Alexandria, Egypt, June 20th, 1864.

Collected by S. S. Allen.

81. Short-toed Lark. *Alauda brachydactyla*,

Leisler.

FEMALE. Constantinople, May 7th, 1862.

Received from Thos. Robson, 1864.

*Genus. MELANOCORYPHA.***82. Calandra Lark. *Melanocorypha calandra*,**

(Linn. ex Briss.).

MALE. Turkey, Jan. 23rd, 1864.

Thomas Robson, Constantinople.

*Genus. OTOCORYS.***83. Shore Lark. *Otocorys alpestris*, (Linn.).**No. 1 } lower left { Shot at Roker near Monkwearmouth,
,, 2 } upper left { about the year 1851, and came into
my possession in 1855.,, 3 (centre). Shot at Hoganas, Sweden, Autumn, 1850,
from H. W. Wheelwright, Esq.

,, 4 (upper right). Received from Dieppe about 1850.

,, 5 (lower right). YOUNG, in first plumage.

From Dvoinik on the Petchora in Northern Russia.

Presented to J. Hancock by Henry Seebohm, 1877.

84. Shore Lark.

Shot at Warkworth, Dec., 1870. J. Robson.

CASE.

Fam. MOTACILIDÆ.

Genus. *ANTHUS*.85. Richard's Pipit. *Anthus Richardi*, Vieill.

No. 1 (left). FEMALE YOUNG, in first plumage.

Shot at Newcastle Town Moor, Oct., 1845,

by Mr. Wm. Davison.

No. 2 (right). Shot at Newbiggin-by-the-Sea, Dec., 1841,

by E. Watson.

86. Tree Pipit. *Anthus arboreus*, (Brisson).

No. 1 (upper right). MALE. Ebchester, May 5th, 1874.

Presented by Fred. Raine, Esq.

,, 2 (lower right). MALE. Taken on nest, Axwell Park,

1882.

87. Meadow Pipit. *Anthus pratensis*, (Brisson).

No. 1 (upper left). Shot near Newcastle.

,, 2 (lower left). Shot near Cuil-na-Shamraig, Argyle-shire, Sept., 1876. E. J. J. Browell, Esq.

,, 3 (upper right). FEMALE. Young in first plumage.

Eshott, near Felton, June 12th, 1876.

G. Longstaff.

,, 4 (lower right). Shot in Northumberland, 1832.

88. Red-throated Pipit. *Anthus cervinus*, (Pall.).

No. 1 (left). Ortukeng, Turkey, Oct. 7th, 1866.

Received from Mr. Thos. Robson.

,, 2 (centre). MALE. Gokesn Valley, Turkey, May, 1864.

Received from Mr. Thos. Robson.

,, 3 (right). -Ust Zylma, May 29th, 1875.

Collected and presented by Henry Seebohm.

89. Water Pipit. *Anthus spinoletta*, (Linn.).

No. 1 (upper left). MALE. Asia Minor, Dec. 1st, 1866.

From Mr. Thos. Robson, Constantinople.

CASE.

No. 2 (right). Killed in the Alps.

From J. Hardy, Dieppe, Autumn, 1853.

„ 3 (lower left). MALE. Summer plumage, June, 1866.

Engstlen Alps, Switzerland.

Collected and presented to J. Hancock by Scott Wilson.

Stuffed by J. Hancock, Sept., 1886.

90. Tawny Pipit. *Anthus campestris*, (L. ex Will.).

No. 1 (left). FEMALE. Ortakoi Hills, May 20th, 1864.

Received from Thos. Robson, Constantinople, 1864.

„ 2 (right). YOUNG, in first plumage.

Received from Messrs. Tuke, 1844.

91. Rock Pipit. *Anthus obscurus*, (Latham).

No. 1 (upper left). Shot at the nest.

Chepstow, April 18th, 1854.

Presented to J. Hancock by W. E. Brooks, Esq.

„ 2 (upper right).

From J. Hardy, Dieppe, May 20th, 1853.

„ 3 (lower left). MALE.

Whitley, Northumberland, 1832. J. Hancock.

„ 4 (lower right). West Loch Tarbert, Loch Fyne,

Oct. 21st, 1875.

Shot by E. J. J. Browell, Esq.

Genus. MOTACILLA.

92. Grey-headed Wagtail. *Motacilla flava*, Linn.

No. 1 (upper left). YOUNG, in first plumage.

Shot by Mr. Lawson on the Haughs near Dunston,

where they bred July 8th, 1870.

„ 2 (upper right). MALE.

Shot south of the Tyne, $1\frac{1}{2}$ miles west of

Tyne Bridge, by T. Robson, May 1st, 1836.

„ 3 (centre). MALE. France, about May 12th, 1868.

Presented to J. Hancock by J. H. Gurney, jun.

„ 4 (lower right). FEMALE. Shot near Dunston

by Joseph Watson, jun., May 21st, 1872.

CASE

93. Yellow Wagtail. *Motacilla Rayi*, (Bonaparte).

No. 1 (upper left). MALE.

,, 2 (upper right). FEMALE.

Shot near Newcastle-on-Tyne about 1836.

,, 3 (lower right). MALE. Shot by Joseph Watson, jun.,
near Dunston, May 21st, 1872.

,, 4 (lower left). Two in first plumage.

Right, 15th June; left, 22nd July.

Oatlands, Surrey, 1872.

94. Grey Wagtail. *Motacilla melanope*, Pallas.

No. 1 (lower left). Changing from Winter to Summer.

Shot about year 1832.

,, 2 (upper left). Winter dress.

Cuil-na-Shamraig, W. Loch Tarbert.

Shot by E. J. J. Browell, Aug. 30th, 1887.

,, 3 (centre). FEMALE. Prudhoe Castle, May, 1836.

,, 4 (upper right). MALE. Summer. Crag-side, Rothbury.

Shot by George Noble, March 30th, 1875.

,, 5 (lower right). Changing from Winter to Summer.

Shot about the year 1832.

95. White Wagtail. *Motacilla alba*, Linn. ex Briss.

No. 1 (upper left). MALE. Turkey, April 15th, 1864.

Thos. Robson.

,, 2 (right). Winter plumage. Cairo, Jan. 18th, 1863.

S. S. Allan.

,, 3 (lower left). Iceland. Winter dress.

96. Pied Wagtail. *Motacilla alba*, Linn. ex Briss.Var. *lugubris*, Temminck.

No. 1 (left). MALE. Newcastle, 1836.

Presented by W. Adamson.

,, 2 (upper right). FEMALE. Durham, March, 1875.

CASE

No. 3 (lower right). First plumage.

North Sunderland, Aug. 8th, 1874.

Nos. 2, 3 presented by Fred. Raine, Durham.

„ 4 (centre). FEMALE.

Killed by the bitter cold weather in front of the Museum,
Stuffed by J. Jackson. March 23rd, 1899.

Remark.—This bird was feeding with the Sparrows and Blackbirds, on the front steps of the Museum on the 22nd March and was found dead next morning close to the building.—Ed.

Fam. CINCLIDÆ.

Genus. CINCLUS.

97. Dipper. *Cinclus aquaticus*, Bechst.

No. 1 (upper left). FEMALE. Shot at Eshott, June, 1876.

Presented to J. Hancock by Mr. Geo. Longstaff.

„ 2 (right). MALE. Northumberland, Aug. 20th, 1894.

„ 3 (lower left). YOUNG, in first plumage.

Shot at Alston, 1841.

Fam. TROGLODYTIDÆ.

Genus. TROGLODYTES.

98. Wren. *Troglodytes parvulus*, Koch.

No. 1 (centre). MALE.

Shot about the year 1832 near Newcastle.

„ 2 (left). Shot up the Derwent Valley, July 8th, 1875.

Presented by Thos. Thompson, Esq.

„ 3 (hind, right). YOUNG. Ebechester, June 2nd, 1880.

„ 4 (front, right). YOUNG.

Oatlands, Surrey, Oct., 1884.

Fam. TURDIDÆ.

Genus. TURDUS.

99. Blackbird. *Turdus merula*, Linn.

No. 1 (upper left). MALE.

Shot at Upsall Hall, Yorkshire, Dec., 1874.

CASE.

No. 2 (right). FEMALE. Shot at Newcastle, 1832.

„ 3 (lower left). YOUNG, changing from the downy
state to first feathers.
Near Newcastle.

Stuffed and presented by John Jackson, 1887.

100. Blackbird.

No. 1 (left). First plumage. Sex not determined.

Killed against a window at Oatlands. 21st July, 1874.

„ 2 (right). MALE, once moulted.

Yellow colour of beak not yet attained.

Shot at Upsall Hall, Yorkshire, Jan., 1875.

101. Ring Ouzel. *Turdus torquatus*, Linn.

No. 1 (left). MALE. Shot at Cullercoats, May 1st, 1834.

„ 2 (centre). YOUNG, in first plumage.

Alston, June 5th, 1838.

„ 3 (right). FEMALE, just moulted.

Shot at Cuil-na-Shamraig, W. Loch Tarbert,

Sept. 4th, 1877, by E. J. J. Browell.

Presented to J. Hancock.

102. Fieldfare. *Turdus pilaris*, Linn.

No. 1 (left). FEMALE. Shot by J. Hancock, near Drontheim,
Norway, May 19th, 1833.

„ 2 (centre). MALE. Shot by J. Hancock, eight miles
East of Drontheim, July 16th, 1833.

„ 3 (right). YOUNG, in first plumage

From the Valley of the Yenesei, E. Siberia,

lat. 69°, July 29th, 1877.

Presented by Henry Seebohm, Esq.

103. Fieldfare.

No. 1 (left). FEMALE. Shot near Upsall Hall, Yorkshire,
Dec. 17th, 1874.

„ 2 (right). MALE. Shot near Upsall Hall, Yorkshire,
Dec. 17th, 1874.

CASE.

104. Missel Thrush. *Turdus viscivorus*, Linn.

No. 1 (left). MALE.

Hartburn, near Morpeth, March 19th, 1879.

Presented by the Rev. J. M. Hick.

,, 2 (right). MALE. Durham, Dec., 1875.

Presented by Fred. Raine, Esq.

105. Missel Thrush.

No. 1 (left). YOUNG. Near Newcastle, 1838.

,, 2 and 3 (right). YOUNG, changing from the downy
state to first feathers.

Woolsington, near Newcastle.

Stuffed by J. Jackson.

Purchased 1899.

106. White's Thrush. *Turdus varius*, Pallas.

No. 1. Shot near Yokohama, Japan, Jan. 8th, 1876.

Presented by Capt. St. John, R.N.

107. Redwing. *Turdus iliacus*, Linn.

No. 1 (left). Newcastle-upon-Tyne, 1832.

,, 2 (centre). MALE.

Grinkle Park, Yorkshire, Jan. 8th, 1867.

,, 3 (right). FEMALE. Sherburn Hill, Oct. 21st, 1875.

Presented by Fred. Raine, Esq.

108. Redwing.

No. 1. YOUNG. Fokstuen, Dovre Feld, Norway,

June 15th, 1883.

Presented by Fred. Raine, Esq.

109. Song Thrush. *Turdus musicus*, Linn.

No. 1 (left). Found dead at Newton Hall,

Northumberland, 1875.

,, 2 (upper right). YOUNG, first plumage.

Killed against the window at Oatlands,

Surrey, June 25th, 1874.

,, 3 (lower right). Near Newcastle, 1832.

CASE.

110. Song Thrush.

No. 1 (left). MALE, plumage once changed.

Killed against the window at Oatlands, Oct., 1882.

Presented and bequeathed by John Hancock.

Received Jan., 1897.

„ YOUNG, just changed from downy state to first feathers.

Woolsington, near Newcastle, May, 1899.

Stuffed and presented by John Jackson.

Genus. MONTICOLA.

111. Rock Thrush. *Monticola saxatilis*, (Linn.).

MALE. Marseilles, South of France.

Presented by Mr. John Richardson.

Genus. SAXICOLA.

112. Wheatear. *Saxicola oenanthe*, (Linn.).

No. 1 (lower left). MALE. Shot in Summer about 1831.

„ 2 (upper left). FEMALE. Shot in Summer about 1831.

„ 3 (upper right). Just after moulting.

Shot on the Leazes, Newcastle-on-Tyne,

Sept. 2nd, 1834.

„ 4 (centre). YOUNG, in first plumage. June 30th, 1837.

„ 5 (lower right). YOUNG in first plumage.

Northumberland, July 16th, 1877.

Thomas Thompson, Esq.

Genus. PRATINCOLA.

113. Whinchat. *Pratincola rubetra*, (Linn.).

No. 1 (lower left). MALE in a worn state.

Killed in July about 1830.

„ 2 (upper left). YOUNG, in first plumage.

Shot at Eshott, June 29th, 1876.

George Longstaff.

„ 3 (upper right). YOUNG in first plumage.

Whitley, July 26th, 1877.

„ 4 (lower right). MALE, fresh state.

Shot May 21st, 1872.

Mr. Joseph Watson.

CASE

114. Stonechat. *Pratincola rubicola*, (Linn.)

No. 1 (upper centre). MALE.

,, 2 (lower centre). FEMALE.

Howick, Northumberland, March 30th, 1835.

Mr. Moffitt.

,, 3 (left). YOUNG, changing from first plumage.

Whitley, August 30th, 1835.

,, 4 (right). MALE. Whitley, 1835.

*Genus. RUTICILLA.***115. Redstart. *Ruticilla phoenicura*, (Linn.).**

No. 1 (lower left). MALE. Just moulted.

Shot at Hartley Bates, Sept. 3rd, 1849.

,, 2 (upper left). FEMALE. Just moulted.

Near Newcastle, August 17th, 1874.

,, 3 (centre). First plumage. Durham, July 4th, 1874.

Presented by Fred. Raine.

,, 4 (right). In breeding state. Northumberland, 1830.

116. Black Redstart. *Ruticilla tithys*, (Scop.).

No. 1 (lower left). YOUNG, in first plumage.

Shot at the Baths of Loche, Switzerland,

July 3rd, 1845, by J. Hancock.

,, 2 (upper left). MALE, in fresh feather.

Received from Paris, 1840.

,, 3 (upper right). MALE, in worn plumage.

Shot at Kandersteg, Switzerland, July 29th, 1845.

,, 4 (lower right). FEMALE, in worn plumage.

Shot at the Baths of Loche, Switzerland, July 3rd, 1845.

,, 5 (centre). MALE. Shot at Cullercoats, 1856.

*Genus. ACCENTOR.***117. Hedge Accentor. *Accentor modularis*,**

(Linn.).

No. 1 (lower left). MALE, first year.

Weybridge, Aug. 9th, 1884 (Scott Wilson).

,, 2 (middle left). MALE.

Upsall Hall, Yorkshire, Jan., 1875.

OARS

- No. 3 (upper left). YOUNG, in first plumage.
Oatlands, June 13th, 1874.
,, 4 (upper right). YOUNG, in first plumage.
Oatlands, June 13th, 1874.
,, 5 (lower right). MATURE.
Upsall Hall, Yorkshire, Dec. 19th, 1874.

118. Alpine Accentor. *Accentor collaris*, Scop.

- No. 1 (lower left). FEMALE.
Grindelwald, Switzerland, August 5th, 1845.
,, 2 (upper left). MALE.
Grindelwald, Switzerland, August 5th, 1845.
Remark.—The above shew the worn state the plumage gets into during the breeding season. J. H.
No. 3 (upper right). In perfect plumage.
Received from Paris about the year 1840.
,, 4 (lower right). First plumage.
Shot by John Hancock in Switzerland, Aug., 1845.

Genus. CYANECULA.

119. Bluethroat. *Cyanecula Suecica*, (Linn.).

- No. 1 (lower left). MALE. In worn plumage,
with red spots. Dieppe, 1842.
,, 2 (upper left). MALE, without spots.
Bought of a dealer in London, 1853.
,, 3 (left centre). FEMALE. Dieppe.
,, 4 (upper centre). MALE, with red spots.
Mirzapore, India, 1861.
W. E. Brooks, Esq.
,, 5 (upper right). MALE, with white spots.
Taken in a Nightingale Trap in Kent. May, 1874.
Presented by Mr. Green, London.
,, 6 (lower right). MALE, with white spot. Dieppe, 1852.
,, 7 (lower centre). YOUNG, in first plumage.
Torgaschino, Aug. 20th, 1880.
Henry Seebohm.
,, 8 (lower hind right). MALE, with red in the white spot.

CASE.

120. Bluethroat.

MALE, with red spot.

Shot on the Newcastle Town Moor, 28th May, 1826.

Shot and presented by Thos. W. Embleton, Esq.

Remark.—Specimen from which Bewick made his figure, and the first recorded British example of this species. I have a good series illustrating all these forms, and after a careful examination of them, can find no character to lead to the conclusion that they should rank as distinct species.

Hancock Catalogue, Nat. Hist. Trans. N. & D., vol. vi., p. 67.

Genus. ERITHACUS.

121. Redbreast. Erithacus rubecula, (Linn.).

No. 1 (left). YOUNG. Killed against a window at Oatlands,
Surrey, June 10th, 1874.

„ 2 (right). MALE. Lorbottle, Jan. 15th, 1875.

Presented by G. J. W. Noble.

„ 3 (lower left). FEMALE, after breeding season.

Summer, 1892. Woolsington, near Newcastle.

Stuffed by J. Jackson.

Purchased 1899.

Genus. DAULIAS.

122. Nightingale. Daulias lusciniæ, (Linn.).

No. 1 (left). FEMALE. Ghizen, April 16th, 1864.

From S. S. Allen.

„ 2 (upper right). MALE.

Oatlands, Surrey, June, 1851.

„ 3 (lower right). YOUNG.

Bourn, Lincolnshire, July 16th, 1880.

Presented by Fred. Raine, Esq.

Genus. SYLVIA.

123. Blackcap. Sylvia atricapilla, (Linn.)

No. 1 (lower left). FEMALE. Near Newcastle, 1832.

„ 2 (upper left). MALE. Near Newcastle, 1832.

„ 3 (upper centre). FEMALE, old.

Oatlands, August 2nd, 1876.

W. C. Hewitson, Esq.

CASE.

No. 4 (middle centre). MALE, young.

Derwent Valley, Co. Durham, July 8th, 1875.

„ 5 (right). FEMALE. Killed against window at Oatlands,
May, 1883.

„ 6 (inner, lower centre). MALE, young.

Ebchester, July 8th, 1880. Fred. Raine, Esq.

„ 7 (outer, lower centre). FEMALE, young.

Ebchester, July 8th, 1880. Fred. Raine, Esq.

124. Garden Warbler. *Sylvia hortensis*, Bechst.

No. 1 (left). Worn plumage previous to moulting.

Jesmond, Aug. 7th, 1874. Shot by George Noble.

„ 2 (centre). Fresh feathers, having just moulted pre-
vious to migrating, August, 1835.

„ 3 (right). YOUNG. Ebchester, July 5th, 1880.

Fred. Raine, Esq.

125. Whitethroat. *Sylvia cinerea*, Bechst.

No. 1 (lower left). YOUNG. Ebchester, June 6th, 1880.

Fred. Raine, Esq.

„ 2 (upper left). YOUNG, first plumage.

Eshott, Northumberland. June 29th, 1876.

Presented by Geo. Longstaff, Esq.

„ 3 (right). MALE. Shot at Lorbottle, May 18th, 1877,
by George Noble.

126. Lesser Whitethroat. *Sylvia curruca*, (Linn.).

No. 1 (upper left). Old Museum.

„ 2 (lower left). Old Museum.

„ 3 (right). Near Cambridge, May 29th, 1884.

Presented by Scott Wilson, Esq.

127. Orphean Warbler. *Sylvia orphea*, Temm.

No. 1 (left). MALE. Asia Minor, May 5th, 1876.

„ 2 (right). FEMALE. Asia Minor, May 6th, 1876.

Both presented to J. H. by Henry Seebohm, Esq.

CASE

128. Dartford Warbler. *Melizophilus undatus*,
Bodd.

No. 1 (upper). Near Weybridge, Surrey, 1852.

Remark.—This bird was knocked down with a stick and sent to W. C. Hewitson, Oatlands, when J. Hancock was staying there on a visit. J. H.

Nos. 2 and 3 (lower). No locality.

Genus. AEDON.

129. Rufous Warbler. *Aedon galactodes*, Temm.

No. 1 (right). Received from R. Dunn. Orkney, Jan., 1866.

Genus. HYPOLAIS.

130. Icterine Warbler. *Hypolais icterina*, Vieill.

No. 1 (right). Sweden, June 7th, 1860.

H. W. Wheelright, Esq.

Genus. ACROCEPHALUS.

131. Great Reed Warbler. *Acrocephalus turdoides*, Meyer.

No. 1 (left). FEMALE. Silesia, May, 1871.

„ 2 (right). MALE. Hungary, May 1st, 1848.

Shot by A. H. Cochrane, Esq.

132. Reed Warbler. *Acrocephalus streperus*,
Vieill.

No. 1 (left). MALE. Presented by Mr. Bond.

„ 2 (centre). FEMALE. Presented by Mr. Bond.

„ 3 (right) FEMALE. Shot by J. Hancock among Wil-
lows in Mr. Wheelright's plantation, by the side
of a small river at Oundle, Northamptonshire,
July, 1843.

133. Sedge Warbler. *Acrocephalus phragmitis*,
Bechst.

No. 1 (lower). Eshott Brooks, near Felton, May, 1878.

Presented by Geo. Longstaff, Esq.

„ 2 (right). MALE. Durham, May 9th, 1879.

Presented by Fred, Raine, Esq.

CASE

134. Empty Case for Aquatic and Marsh Warblers.*Genus. LOCUSTELLA.***135.** Grasshopper Warbler. *Locustella naevia*,
(Briss.).

No. 1 (left). Shot at Bishop Auckland.

,, 2 (right). MALE. Both specimens shot in 1832.

136. Savi's Warbler. *Locustella luscinioides*,
Savi.

1 and 2. From Cambridge, 1872.

137. Willow Wren. *Phylloscopus trochilus*,
(Linn.).

No. 1 (lower left). MATURE, deep in the moult.

Found dead in Surrey, August 7th, 1883.

Remark.—This specimen shews that the Warblers cast their feathers before migrating southwards. J. H.

No. 2 (upper left). MALE. Near Newcastle, 1830.

,, 3 (upper centre). MALE, just moulted.

Newton Hall, July 30th, 1875.

,, 4 (right). FEMALE. Oatlands, May 4th, 1874.

,, 5 (lower centre). First plumage.

Oatlands, June 13th, 1879.

138. Chiffchaff. *Phylloscopus rufus*, (Bechst.).

No. 1 (upper left). YOUNG. June 2nd, 1880.

Presented by Fred. Raine, Esq.

,, 2 (lower left). YOUNG. Oatlands, Sept., 1884.

,, 3 (upper right). MALE.

Derwent Valley, April 22nd, 1873.

,, 4 (lower right). MALE.

Derwent Valley, May 8th, 1873.

Nos. 3 and 4 presented by Thos. Thompson, Esq.

CASE.

139. Wood Wren. *Phylloscopus sibilatrix*,
(Bechst.).

No. 1 (lower left). MALE. Near Newcastle, 1832.

,, 2 (upper left). MALE. Ouseburn, May 5th, 1832.

,, 3 (right). MALE. Jesmond, May 5th, 1832.

C. M. Adamson, Esq.

140. Wood Wren.

No. 1 (inner). YOUNG. Ebchester, July 12th, 1880.

,, 2 (outer). YOUNG. Ebchester, June 26th, 1880.

Presented by Fred. Raine, Esq.

141. Yellow-browed Warbler. *Phylloscopus superciliosus*, (Gmelin).No. 1 (left). Shot on the Northumberland Coast, opposite
Bates' (St. Mary's) Island, by John Hancock,
Sept. 26th, 1838.*Remark.*—This is the first British killed specimen on
record. See Annals of Nat. Hist., vol. 2, p. 310.

No. 2 (upper centre). Muddapore, Nov. 12th, 1878.

,, 3 (right). MALE. Howrah, Nov. 2nd, 1878.

,, 4 (lower centre). MALE. Dec., 1878.

Nos. 2, 3, 4 presented by W. E. Brooks, Esq.

142. Yellow-browed Warbler. *P. superciliosus*,
Var. *Humei*.

Muddapore, India, 1879.

W. E. Brooks, Esq.

Remarks.—The four specimens in this case are to shew
how closely this species is allied to *Phylloscopus super-*
ciliosus. J. Hancock.**143. Empty Case.****144. Goldcrest. *Regulus cristatus*, Charleton.**

No. 1 (upper left). First plumage.

Scotland, Aug. 23rd, 1877. Miles Browell, Esq.

CASE.

No. 2 (upper centre). MALE. Oatlands, Nov., 1879.

„ 3 (upper right). MALE.

„ 4 (lower right).

Off the coast of Scotland, Oct. 24th, 1839.

Presented by Capt. Warham.

„ 5 (lower centre). FEMALE.

145. Firecrest. *Regulus ignicapillus*, (Temm.).

No. 1 (left). Caught on the rigging of a ship off Cromer,
near the Norfolk coast, by Capt. J. Cooks,
Oct., 1836.

„ 2 (right). Said to be from Scotland.

„ 3 (lower). Said to be from Scotland.

Nos. 2 and 3 bought of John Wingate.

146. Empty Case.

Fam. PARIDÆ.

Genus. *PARUS*.

147. Great Titmouse. *Parus major*, Linn.

No. 1 and 2 (left). MALES. 1831.

„ 3 (flying). FEMALE? Lorbottle, July 15th, 1875.

„ 4 (centre). First Plumage. Oatlands, June 21st, 1881.

148. Great Titmouse.

Found in a dying state at Oatlands, Sept. 11th, 1885.

149. Blue Titmouse, *Parus ceruleus*, Linn.

No. 1 (lower left). YOUNG, moulting.

Crag-side, Rothbury. Shot by George Noble, Aug., 1875.

„ 2 (upper left). MALE. Lorbottle.

Shot by George Noble, Mar. 29th, 1875.

„ 3 (right). Shot near Newcastle-on-Tyne about 1830.

150. Cole Titmouse. *Parus ater*, Linn.

No. 1 (lower). Heysham, Carlisle.

„ 2 (upper). Lorbottle. George Noble, Jan. 15th, 1875.

„ 3 (right). YOUNG, in first plumage.

Derwent Valley, May, 1882.

Presented by Edwin O. Reid, Esq.

CASE

151. Cole Titmouse. *Parus ater*, Linn.

No. 2 (right). MATURE MALE. Oatlands, Oct. 18th, 1884.

Marsh Titmouse. *Parus palustris*, Linn.

No. 1 (left). YOUNG. Ebchester, June 28th, 1880.

Presented by Fred. Raine, Esq.

152. Marsh Titmouse. *Parus palustris*, Linn.

No. 1 (left). Near Newcastle, 1831.

„ 2 (upper left). MATURE, just moulted.

Aug. 17th, 1874.

„ 3 (right). YOUNG. Ebchester, June 3rd, 1880.

Fred. Raine, Esq.

153. Crested Titmouse. *Parus cristatus*, Linn.

Nos. 1 and 2. Both specimens shot in the Pine Forests of Strathspey, Scotland, Nov., 1848.

Received from Mr. Dunbar.

*Genus. ACREDULA.***154. Long-tailed Titmouse. *Acredula caudata*,
(Brisson).**

No. 1 (upper). Found dead at Tynemouth, Nov., 1852,
by W. J. Forster, Esq.

„ 2 (lower left). From Torgaschino, Sept. 15th, 1879.

Henry Seebohm, Esq.

„ 3 (lower right). From the "Allan Museum."

**155. Long-tailed Titmouse. *Acredula caudata*,
(Brisson.)**

Var. *rosea*, Blyth.

No. 1 (left). Northumberland about 1829.

„ 2 (right). MALE. Bishop Auckland, April 25th, 1829.

„ 3 (centre). First plumage. Hornby, Yorkshire.

Received from Mr. A. Savage.

CASE

*Genus. PANURUS.***156. Bearded Titmouse. *Panurus biarmicus*,**
(Linn.).

No. 1 (lower left). From Holland, 1835.

,, 2 (upper left). Holland. Kept alive by John Hancock.

,, 3 (right). Two MALES and one FEMALE (centre).

Whittlesea Mere, 1841.

H. W. Wheelwright, Esq.

157. Bearded Titmouse.

Shot in Norfolk, Nov. 28th, 1884.

Presented by Scott Wilson, Esq.

Fam. AMPELIDÆ.*Genus. AMPELIS.***158. Waxwing. *Ampelis garrulus*, Linn.**

No. 1 (left). Shot in Northumberland.

,, 2 (right), FEMALE. Jesmond, 1850.

159. Waxwing.

Sweden, 1848 and 1859.

From H. W. Wheelwright, Esq.

160. Waxwing.

No. 1 (upper left). Shot near Rothbury, Nov., 1866.

Presented by Sir W. G. Armstrong.

,, 2 (lower left). Found dead on the banks of the North

Tyne, Feb., 1867, by J. C. Anderson, Esq.

,, 3 and 4 (centre and right).

Shot at Winlaton Mill, Jan. 12th, 1867.

Fam. MUSCICAPIDÆ.*Genus. MUSCICAPA.***161. Pied Flycatcher. *Muscicapa atricapilla*, L.**

No. 1 (lower left). Shot at Cleadon, May 19th, 1843.

,, 2 (lower centre). Shot at Cleadon, May 19th, 1843.

,, 3 (upper left). FEMALE.

Shot at Cleadon, May 19th, 1843.

CASE

- No. 4 (lower right). MALE. Shot at Walker, 1841.
Geo. Redhead.
,, 5 (upper right). Winter plumage.
Hartley Bates, 1838.
,, 6 (upper centre). YOUNG, first plumage.
Grindelwald, Switzerland, August, 1845.

162. Spotted Flycatcher. *Muscicapa grisola*, L.

- No. 1 (left). FEMALE.
Derwent Valley, Co. Durham, June 20th, 1875.
Presented by Thos. Thompson, Esq.
,, 2 (right). MALE. Found dead at Rounton Grange,
Yorkshire, May 29th, 1871.
,, 3 (centre). YOUNG, first plumage.
Oatlands, July 18th, 1872.

163. Empty Case.

164. Rufous Flycatcher. *Muscicapa parva*, Bechst.

- No. 1 (left). Shot at Etawah, India, March 1869.
,, 2 (upper centre). First plumage.
Cawnpore, India. Shot Oct. 22nd, 1868.
,, 3 (right). MALE Etawah, India, Feb., 1869.
Nos. 1, 2, 3 presented by W. E. Brooks, Esq.
,, 4 (lower centre). FEMALE? May 3rd, 1865.
T. Robson. Constantinople.

Genus. HIRUNDO.

Fam. HIRUNDINIDÆ.

165. Swallow. *Hirundo rustica*, Linn.

- No. 1 (left). First plumage.
Eshott, near Felton, July 13th, 1876.
Presented by Geo. Longstaff.
,, 2 (centre). FEMALE. Durham May 7th, 1874.
,, 3 (right). MALE. Ebchester, May, 1874.
Nos. 2 and 3 presented by Fred. Raine, Esq.

CASE

166. Swallow, variety.

Presented by Mr. R. Forster, Jun., White House.

Remark.—It was killed near White House, Co. Durham, about Aug. 5th, 1881. The specimen was sent to me by Mr. Richd. Howse, August 11th. It had been skinned but was too rotten to preserve. J. H.

Genus. *CHELIDON.*

167. Martin. *Chelidon urbica*, (Linn.).

No. 1 (left). FEMALE. Ebchester, May 24th, 1873.

„ 2 (centre). MALE. Ebchester, May 13th, 1873.

Presented by Fred. Raine, Esq.

„ 3 (lower right). First plumage. Newbiggin-by-the-Sea.

Killed by the cold weather, 1871.

„ 4 (upper right). YOUNG.

Found dead, Oatlands, Oct., 1887.

Genus. *COTILE*

168. Sand Martin. *Cotile riparia*, (Linn.).

No. 1 (upper left). FEMALE.

Shot at Eshott, near Felton, May 31st, 1876.

„ 2 (flying). MALE. Eshott, near Felton, May 31st, 1876.

Presented by Geo. Longstaff.

„ 3 lower left). Light variety. Old Museum Collection.

Fam. CYPSELIDÆ.

Genus. *CYPSELUS.*

169. Swift. *Cypselus apus*, (Linn.) ex Will.

YOUNG MALE. North Sunderland, Aug. 17th, 1874.

Presented by Fred. Raine, Esq.

170. Swift.

No. 1 (left). MALE. Durham, July 15th, 1875.

„ 2 (right). FEMALE. Durham, July 15th, 1875.

Presented by Fred. Raine, Esq., Durham.

CASE

171. Alpine Swift. *Cypselus melba*, (Linn.).

Remark.—No locality for this specimen, which has been in the collection of J. Hancock for many years. Stuffed March 21st, 1879. J. H.

Fam. CAPRIMULGIDÆ.*Genus. CAPRIMULGUS.***172. Nightjar. *Caprimulgus Europæus*, Linn.**

No. 1 (upper left). MALE. Northumberland, 1839.

,, 2 (middle left). FEMALE. Northd., 1838.

Presented by Mr. Armstrong.

,, 3 (lower left). Two, in first plumage.

Taken in the County of Durham, July 15th, 1878.

Presented by Thomas Thompson, Esq., Winlaton.

Remark.—Ground made to represent the plumage of the birds as they are generally found in nature. J. H.

Red-necked Nightjar. *Caprimulgus ruficollis*,

Temm.

No. 4 (right). Shot at Killingworth, near Newcastle, and purchased of Mr. Pape, Gamedealer, by John Hancock, Oct. 6th, 1856, the day after the bird was shot. This is the first British killed specimen on record. J. H.

ORDER. COLUMBÆ.**Fam. COLUMBIDÆ.***Genus. COLUMBA.***173. Ring Dove. *Columba palumbus*, L. ex. Briss.**

No. 1 (left). MALE. Cumberland, May 3rd, 1883.

,, 2 (right). FEMALE. Cumberland, April 22nd, 1883.

Nos. 1, 2 presented by Mrs. Henry Watson, Newcastle.

,, 3 (lower). Two in the down.

E. Bidwell, Esq., Sept. 8th, 1883.

CASE

174. Stock Dove. *Columba oenas*, Linn. ex Briss.

No. 1 (left). MALE. Shot with another at Brampton,
Cumberland, May, 1876.

Presented by C. M. Adamson, Esq.

„ 2 (centre). MALE, in first plumage.

Taken out of a Nest at Cleadon, May 9th, 1880.

H. C. Abbs, Esq.

„ 3 (right). Taken off a Nest in Rockingham Forest,
Northamptonshire, April, 1842.

Presented by H. W. Wheelwright, Esq.

175. Rock Dove. *Columba livia*, Linn. ex Briss.

No. 1 (lower left). First plumage.

Newbiggin-by-the-Sea, Jan., 1835. J. Hancock.

„ 2 (flying). FEMALE. Donegal, Ireland, Dec. 8th, 1885.

„ 3 (right). MALE. Donegal, Ireland, Dec. 8th, 1888.

Presented by Arthur Brooke, Esq.,

Killybegs, Co. Donegal.

Genus. TURTUR.

176. Turtle Dove. *Turtur auritus*, Ray.

No. 1. MALE Found shot near the lake at Oatlands,

May 24th, 1879. J. Hancock.

ORDER. GALLINÆ.**Fam. PTEROCLIDÆ.**

Genus. SYRRHAPTES.

**177. Pallas Sand Grouse. *Syrrhaptes paradoxus*,
(Pallas).**

No. 1 (right). FEMALE. Shot at Clarence, Teesmouth, 1863.

„ 2 (left). MALE. Shot at Clarence, Teesmouth, 1863.

„ 3 (lower centre). FEMALE.

Shot at Clarence, Teesmouth, 1863.

Nos. 1, 2, 3 bought at Mr. Oxley's Sale, Redcar.

„ 4 (upper centre—flying). FEMALE.

Killed against telegraph wires, Craggside,

Rothbury, 1888.

Presented by Lord Armstrong, May, 1888.

CASE

Fam. PHASIANIDÆ.

Genus. COTURNIX.

178. Quail. *Coturnix communis*, Bonnaterre.

No. 1 (left). FEMALE. Cleadon, 1850.

Killed against telegraph wires at Cleadon Station.

Presented by Richard Howse.

,, 2 (left centre). FEMALE.

North Sunderland, Jan. 10th, 1881.

,, 3 (right centre). Tyneside, May, 1837.

,, 4 (centre). YOUNG in the down. Mr. Bond.

,, 5 (right). MALE? Shot near Newton, Corbridge-
on-Tyne, by James Harvey, Esq.*Presented by Miss Harvey, May 25th, 1894.*

Genus. CACCABIS.

179. Red-legged Partridge. *Caccabis rubra*,

(Brisson).

No. 1 (left). Old Museum.

,, 2 (right). Found dead by Scott Wilson, in a field at
Wisley, Surrey, Jan. 23rd, 1883.

,, 3 (lower left). Two YOUNG in the down.

Bournsen, July, 1880 and 1882.

Genus. PERDIX.

180. Partridge. *Perdix cinerea*, Brisson.

No. 1 (centre). MATURE MALE.

Coupland, near Wooler, Dec. 28th, 1898.

,, 2 (left). MATURE FEMALE.

Coupland, near Wooler, Dec. 28th, 1898.

*Nos. 1 and 2 presented by J. D. Scott, Esq.**Stuffed by J. Jackson.*

,, 3 (right). MATURE MALE. Dark variety.

Shot at Ulgham Park Farm, Northd., Nov., 1869.

*Presented by Geo. E. Crawhall, Esq., 1885.**Stuffed by Duncan.**Remark.*—No. 3 is a fine mature male of the so-called
Lorraine Partridge (*Perdix montana*, Brisson, the

CASE

Perdix cinerea var. **montana**, Jardine, Nat. Lib. Orn., IV., p. 101, plate 2, 1834. This variety occurs occasionally in the mid-eastern part of Northumberland either in small coveys or single individuals, but, so far as is known, recorded only in recent years. The young have a distinct first plumage, as may be seen in an example under the shade on the adjoining Floor Cabinet, and others in intermediate dress, not having yet acquired the mature plumage. An example of this variety, shot near E. Dereham, Norfolk, was figured on February 13th, 1897, in the "Field" Newspaper. The chick in the down of this variety is unknown. *Editor.*

Genus. *PHASIANUS*.

181. Pheasant. Phasianus Colchicus, Linn.

No. 1 (left). FEMALE. "The old Brown Pheasant."

„ 2 (right). MALE. "The old Brown Pheasant."

Nos. 1, 2 from Ravensworth, Feb., 1833.

„ 3 (lower). YOUNG in the down. Bred in Newcastle.

Presented by Alfred Hume, Esq., 1892.

182. Pheasant.

No. 1. MALE. "Ring Pheasant." Hornby Park, 1859.

Presented by Mr. Anthony Savage.

183. Pheasant.

No. 1 (left). Hybrid between the Common Pheasant and the Golden Pheasant.

Bought in a Poulterer's shop in Newcastle, Nov., 1874.

„ 2 (right). FEMALE Common Pheasant in male plumage.

Fam. **TETRAONIDÆ.**

Genus. *LAGOPUS*.

184. Red Grouse. Lagopus Scoticus, (Brisson.)

No. 1 (upper left). MALE. Northumberland.

„ 2 (right). TWO FEMALES. Northumberland.

Presented by Thos. Anderson, Esq., Dec. 16, 1842.

CASE

No. 3 (lower). YOUNG, in downy state.

From Alston and Scotland.

Presented by Thos. Thompson, Esq., and others.

„ 4 (lower left). YOUNG, in first feathers plumage.

From Cragside and Scotland.

Presented by Arthur Newall, Esq., and others.

185. Red Grouse.

No. 1 (centre). MALE. Shot near the Reedwater, 1863.

Presented by Mark Jobling, Esq.

Remark.—This specimen shews an intermediate state of the plumage between the *L. saliceti* (see next case) and the *L. Scoticus*. The white on the breast and abdomen is in the same position as in *L. saliceti* in summer. J. Hancock.

No. 2 (right). FEMALE. Cragside, Rothbury, Oct., 1888.

Presented by Lord Armstrong.

(Very large, weight 1 lb. 9 oz.). J. H.

„ 3 (left). FEMALE. Shot near Elsdon, Sept., 1892.

Presented by Geo. E. Crawhall, Esq.

(Shews many white feathers). J. H.

186. Willow Grouse. *Lagopus saliceti*, (Temm.).

„ *albus*, Gmelin.

No. 1 (right). MALE. Summer plumage. Sweden.

Bought at the sale of the late Mr. Wheelwright,

March 13th, 1866.

Stuffed Nov., 1888. J. H.

„ 2 (left). FEMALE. Summer plumage. Shot on an Island near Lovungen, Norway, 22nd June, 1833.

„ 3 (lower). Downy state of the Willow Grouse.

No. 3. Two (centre) *L. albus*, collected by Henry Seebohm, Esq., in the Valley of the Yenesei.

„ 4 (right). Lapland. This bird shews that it gets the feathers on the wings like our Red Grouse before it gets the white feathers on the wings.

Presented by Edward Bidwell, Esq.

CASE

187. Ptarmigan. *Lagopus mutus*, Montin.

- Nos. 1 and 5 (centre). **MALE.** Summer plumage.
Scotland, Sept. 16th, 1840.
- No. 2 (upper). **MALE.** Winter plumage.
Scotland, Dec., 1841.
- „ 3 (left). **FEMALE.** Winter plumage.
Auckleeke, Blair Athol, March 20th, 1834.
- „ 4 (centre). Downy state. Alps of Switzerland.
Cochrane, Esq.
- „ 6 (right). **MALE**, changing from young to mature
plumage.
Kingussie, Aberardar, Inverness, Sept., 1890.
Presented by Miss Nell Allhusen, per R. Y. Green, Esq.
Stuffed by J. Jackson.

Genus. TETRAO.

188. Black Grouse. *Tetrao tetrix*, Linn.

- No. 1 (left). **MALE**, changing from first plumage to
mature, 1840. **J. H.**
- „ 2 (right). **MALE**, changing from first to mature
plumage. Near Haydon Bridge, 6th Sept., 1898.
Presented by Geo. E. Crawhall, Esq.
Stuffed by J. Jackson.

189. Black Grouse. *Tetrao tetrix*, Linn.

- No. 1 (left). **FEMALE.** Northumberland, Jan., 1833.
Presented by Mr. Losh.
- „ 2 (right), **MATURE MALE.** Northumberland.

190. Black Grouse.

- No. 1. **MATURE MALE**, changing from summer to winter
plumage. Near Elsdon, Sept. 1st, 1893.
Presented by Geo. E. Crawhall, Esq.
Stuffed by J. Jackson.

CASE

191. Capercaillie. *Tetrao urogallus*, Linn. ex Briss.

No. 1 (left). MATURE MALE. Norway, 1837.

,, 2 (right). FEMALE. Norway, 1837.

,, 3 (left). YOUNG in down and first feathers.

Hornby. Mr. Anthony Savage, Aug., 1858.

,, 4 (right). YOUNG in downy state. E. Bidwell, Esq.

192. Capercaillie.

No. 1 (left). MATURE FEMALE. Norway, 1837.

,, 2 (right). MATURE MALE. Norway, 1837.

Both presented by Mr. Hedley.

193. Hybrids between Pheasant and Black Grouse.

No. 1 (left). Shot at Belsay Dec., 1842.

Presented by Charles Atticus Monk, Esq., Humshaugh.

From Old Museum Collection.

,, 2 (right). Hybrid. Shot at Alnwick Castle, 1837.

Presented by His Grace the Duke of Northumberland, 1838.

From the Old Museum Collection.

*Both stuffed by Duncan.***ORDER. GRALLÆ.****Fam. OTIDIDÆ.***Genus. OTIS.***1. Great Bustard. *Otis tarda*, Linn.**

No. 1. MALE. Odessa, Russia, Jan., 1833.

Presented by Anthony Atkinson, Esq.

2. Great Bustard.

No. 1 (left). FEMALE.

Brampton, Cumberland, March 8th, 1854.

Remarks.—In the year 1875 it was bought at Col. Coulson's sale at Blenkinsop Hall, by Mrs. Hugh Lee Pattinson, and presented to John Hancock, Dec. 5th, 1875. J. H.

No. 2 (right). YOUNG in the down from the Volga District, Russia.

CASE

3. Ruffed Bustard. Otis Houbara, Gmelin.Var. or race **Otis Macqueeni, J. E. Grey.**

No. 1 (left). **MALE.** Shot near Marske-by-the-Sea, Yorkshire, Oct. 5th, 1892, by Mr. Richardson.

*Purchased for the Museum per Mr. Pearce Coupe
by Rd. Howse, Nov., 1892.*

Restuffed by J. Jackson.

Remark.—This bird was shot on the Yorkshire Coast near Marske-by-the-Sea by Mr. Richardson, about 12 o'clock, Oct. 5th, 1892, in a grass field, where it was feeding on grass. It was sent at once to Mr. Pearce Coupe, who correctly identified it as Macqueen's Bustard, to be preserved. After it was skinned the body was cooked and eaten by Mr. Coupe and friend. The bones taken out were carefully cleaned and afterwards presented to this Museum by Mr. Coupe. The bird was slightly in the moult. After it was purchased the bird was unstuffed and the skin carefully cleaned and restuffed by John Jackson. This is the second recorded specimen that has been killed in England. See Nat. Hist. Trans., Northd., Durham, etc., vol. xi., p. 345. *Richard Howse.*

Little Bustard. Otis tetrax, Linn.

No. 1 (centre). **FEMALE.** Shot on Newmarket Heath.

*Presented by Sir Waller C. Trevelyan, Bart.,
July, 1874.*

From Old Museum Collection.

Remark.—The specimen from which Bewick made his drawing or figure. J. H.

No. 2 (right). **MALE. TURKEY.**

From Old Museum Collection.

CASE

Fam. **ÆDIGNEMIDÆ.**Genus. *ÆDIGNEMUS.***4. Great Plover. *Ædignemus crepitans*, Temm.**

No. 1 (left). From Old Museum Collection.

,, 2 (centre). Shot at the Farne Islands.

Presented by J. D. Walker, Esq.

From Old Museum Collection.

Restuffed by John Jackson, Nov., 1890.

No. 3 (right). Downy state.

Bought in London, April, 1853.

5. Empty Case for Great Plover.Fam. **GLAREOLIDÆ.**Genus. *GLAREOLA.***6. Pratincole. *Glareola pratincola*, (Linn.).**

No. 1 (left). Calcutta. E. Blyth, 1848.

,, 2 (right). Calcutta. E. Blyth, 1848.

7. Empty Case for Pratincole.**8. Empty Case for Cream-coloured Courser.**Fam. **CHARADRIIDÆ.**Genus. *PLUVIALIS.***9. Golden Plover. *Pluvialis apricarius*, (Linn.).
= *Charadrius pluvialis*, Linn.**No. 1 (left). **MALE.** Summer plumage.

Prestwick Carr, April, 1843.

Presented by Richard Reay.

,, 2 (centre). Summer plumage. Alston, April 13th, 1840.

,, 3 (front). Downy state.

Presented by Mark Booth, 1844.

,, 4 (right). First plumage.

Northumberland, about Aug. 18th. Miss E. Noble.

CASE

10. Golden Plover.

No. 1 (centre). MALE, changing plumage.

[Northumberland. Presented by John Laws.

„ 2 (right). MALE, changing plumage.

Newbiggin-by-the-Sea, Jan. 21st, 1881.

Presented by E. O. Reid

„ 3 (upper right). YOUNG, in first plumage.

Throckley Fell about 1861.

Presented by John Laws.

„ 4 (left). Ordinary plumage. Stuffed before 1829.

Remark.—This is the first bird stuffed by J. Hancock, which he considered to be anything like a bird. J. H.

11. Golden Plover.

No. 1. Variety with much white on the wings.

Shot at Lorbottle, Oct. 12th, 1885.

Presented by John Noble, Esq., 1885. J. H.

**12. Grey Plover. *Pluvialis varius*, (Brisson).
et *Helveticus*, (Brisson).**

No. 1 (left). MALE, summer plumage.

The Wash, Whittlesea Mere, May 17th, 1843.

„ 2 (centre). FEMALE, summer plumage.

The Wash, Whittlesea Mere, May 21st, 1843.

„ 3 (right). MALE, summer plumage.

The Wash, Whittlesea Mere, May 17th, 1843.

The above three presented by H. W. Wheelwright, Esq.

„ 4 (front). Downy state.

Collected by H. Seebohm and Harvey Brown, Esqs.

Alexievka, in the Valley of the Lower Petchora,

Russia, July 12th, 1875.

13. Grey Plover.

No. 1 (hind left). First plumage. Jarrow Slake, 1838.

J. Hancock.

„ 2 (centre). First plumage.

Newbiggin-by-the-Sea, 1840.

CASE

No. 3 (right). Winter dress. Newbiggin-by-the-Sea, 1841.

„ 4 (front left). IMMATURE MALE.

Seaton Sluice, Oct. 12th, 1895.

Stuffed by John Jackson.

Presented by John Duncan.

Genus. MORINELLUS.

14. Dotterel. *Morinellus Sibericus*, (Lepchin).

No. 1 (front left). First plumage. Cross Fell, Aug., 1843.

„ 2 (hind left). First plumage. Cross Fell, Sept., 1843.

„ 3 (centre). FEMALE. Summer plumage.

Newcastle Town Moor, May, 1862.

„ 4 (right). MALE. Shewing many worn winter feathers mixed with summer feathers. Newcastle Town Moor, May, 1840.

„ 5 and 6 (front). Downy state.

Fokstuen, Dovrefeld, Norway, July 2nd, 1883.

Presented by Fred. Raine, Esq.

Genus. CHARADRIUS.

15. Ringed Plover. *Charadrius hiaticula*, Linn.

No. 1 (front). Downy state.

„ 2 (front). Downy state.

Nos. 1 and 2 presented by E. Bidwell, Esq., 1881.

„ 3 (front left). First plumage. Whitley Sands, 1836.

„ 4 (hind left). First plumage. Whitley Sands, 1836.

„ 5 (upper centre). MATURE FEMALE.

Newbiggin-by-the-Sea, Feb., 1881. Edwin O. Reid.

„ 6 (lower centre). MATURE MALE.

Brough Marsh, Cumberland. C. M. Adamson.

„ 7 (front right). FEMALE.

Newbiggin-by-the-Sea, Feb., 1881. E. O. Reid.

„ 8 (hind right). MALE in breeding plumage.

Northumberland Coast, May 22nd, 1893. Purchased.

Stuffed by John Jackson.

CASE

- 16. Little Ringed Plover. *Charadrius minor*,**
 Meyer.
 Nos. 1 and 2. FEMALE. Dieppe, 1845 and 1847.
 Received from James Hardy.

- 17. Kentish Plover. *Charadrius Cantianus*,**
 No. 1 (left). First plumage? Latham.
 Amoy, Nov., 1866. R. Swinhoe.
 „ 2 (left centre). MALE.
 Amoy, China, April, 1867. R. Swinhoe.
 „ 3 (right centre). FEMALE.
Remark.—I take this to be mature. J. H.
 „ 4 (front centre). Downy state. Edward Bidwell.
 „ 5 (right). Downy state. Kent.
 Presented by C. M. Adamson, Esq.
Genus. VANELLUS.

- 18. Peewit. *Vanellus cristatus*, Meyer.**
 No. 1 (right). MALE, winter plumage. Gosforth, Dec., 1864.
 Presented by C. M. Adamson, Esq.
 „ 2 (left). MALE. Summer plumage.
 Lorbottle, Northumberland, April 2nd, 1872.
 Capt. A. Noble, R.A.

- 19. Peewit.**
 No. 1 (left). First feathers. Northumberland, 1881.
 „ 2 (centre). MALE. Young. Cullercoats, Sept., 1895.
Stuffed by John Jackson. Presented by John Duncan.
 No. 3 (right). Changing from down to first plumage,
 May, 1882.
Stuffed and presented by John Jackson.

Genus. HÆMATOPUS.

- 20. Oyster Catcher. *Haematopus ostralegus*,**
 Linn.
 No. 1 (lower left). Stranraer, Scotland, Feb. 1st, 1881.
 Presented by Mr. Galbraith.
 „ 2 (upper left). Summer. Northumberland Coast.
 „ 3 (right). Changing from down to first plumage.
 Tummel, Perthshire, July 1st, 1884.
 Presented by Scott Wilson, Esq.

CASE.

21. Oyster Catcher.

No. 1 (left). FEMALE. Newton-by-the-Sea, Dec., 1893.

,, 2 (right). MALE, not Mature. Boulmer, Feb., 1897.

*Both stuffed by J. Jackson.**Purchased.**Genus. STREPSILAS.***22. Turnstone. *Strepsilas interpres*, (Linn.).**

No. 1 (left). First plumage.

Newbiggin-by-the-Sea, Aug. 19th, 1883.

Presented by J. I. Maling, Esq.

,, 2 (centre). MALE and FEMALE.

Shot at the Nest, June 14th, 1833, on a small Island
 near Torghatten, Norway, taken by John Hancock
 and W. C. Hewitson. Stuffed 25th Aug., 1882.
 J. H.

,, 3 (right). MALE. Summer plumage.

Newbiggin-by-the-Sea, Aug. 19th, 1882.

*Presented by J. I. Maling, Esq.***23. Turnstone.**

No. 1 (left). MALE. Winter plumage Morpeth, 1830.

,, 2 (upper centre). FEMALE. Summer plumage.

Northumberland, Dec. 7th. 1885.

Presented by J. I. Maling, Esq.

,, 3 (right). FEMALE. Winter plumage.

Newbiggin-by-the-Sea, Jan. 11th, 1830.

,, 4 (lower centre). FEMALE.

St. Mary's Island, May 22nd, 1894.

*Stuffed by John Jackson.**Presented by John Duncan.***Fam. SCOLOPACIDÆ.***Genus. NUMENIUS.***24. Curlew. *Numenius arquata*, (Linn.).**

No. 1. Shot at Horsley, Redewater,

Northumberland, March, 1831.

Presented by Mitford, Esq., of Mitford.

CASE

25. Curlew.

- No. 1 (left). Downy state, 1864. H. Parker, Esq.
 ,, 2 (centre). MALE. Bought in London, Nov. 18, 1882.
 ,, 3 (right). Changing from downy state to first feathers.
Presented by Edward Bidwell, 1883.

26. Curlew.

- No. 1 (right). FEMALE, Mature.
 Whitley, Northumberland, Aug. 12th, 1893.
Stuffed by John Jackson. Presented by John Duncan.
 No. 2 (left). First feathers.
 Woolsington, Northumberland, July 22nd, 1898.
Stuffed and presented by John Jackson.

27. Whimbrel. Numenius phæopus, (Linn.).

- No. 1. (right). MATURE. Worn state.
 From Old Museum Collection.
Stuffed by R. R. Wingate.
 ,, 2 (centre). Downy state. Shetland, July 3rd, 1882.
 Fred. Raine, Esq.
 No. 3 (left). MALE, mature.
 St. Mary's Island, Northumberland, May 8th, 1893.
Stuffed by John Jackson. Purchased.

28. Whimbrel.

- No. 1 (left). YOUNG, first plumage.
 Whitley Sands, Aug., 1835.
 ,, 2 (right). YOUNG, first plumage.
 Shot by W. C. Hewitson on the Northumberland
 Coast, Sept. 6th, 1830.

Genus. LIMOSA.

29. Black-tailed Godwit. Limosa ægocephala (L.).
 ,, **melanura, Leis.**

- No. 1 (left). FEMALE. Summer plumage.
 Prestwick Carr, near Newcastle-upon-Tyne, 1831.

CASE.

- No. 2 (right). MALE? Summer plumage.
 Bought in London May 3rd, 1867.
 Presented by J. H. Gurney, Jun., Esq.
- „ 3 (centre). Downy state.
 Presented by E. Bidwell, Esq.

30. Black-tailed Godwit.

- No. 1 (left). YOUNG. First plumage.
 Shot at Prestwick Carr by Rd. Reay, Sept., 1846.
- „ 2 (centre). YOUNG. First plumage.
 T. C. Heysham, Esq., Carlisle.
- „ 3 (right). Winter plumage. India.

**31. Bar-tailed (Common) Godwit. *Limosa rufa*,
 Brisson.**

- No. 1 (left). Northumberland Coast, 1877.
 Presented by Thos. Thompson, Esq.
- „ 2 (upper centre). MALE?
 Shot at St. Mary's Island, 1837.
- „ 3 (lower centre). Changing plumage.
 Shot near Alnwick, March, 1835.
 Presented by Mr. Thompson.
- „ 4 (right). MALE. Holy Island, Sept. 8th, 1893.
Stuffed by J. Jackson. Presented by Rd. Howse.

32. Bar-tailed (Common) Godwit.

- No. 1 (left). First plumage. Whitley Sands, Oct., 1840.
 J. Hancock.
- „ 2 (centre). MALE. Winter plumage.
 Bought in Newcastle, May 20th, 1835.
- „ 3 (right). FEMALE. Winter plumage.
 Fenham Flats, Northumberland, 22nd Jan., 1830.
- Remark.*—The largest specimen I have ever seen. J. H.

CARR.

*Genus. MACRORHAMPHUS.***33. Red-breasted Snipe. *Macrorhamphus*
griseus, (Gmelin).**

No. 1 (left). Skin bought in London, Sept., 1848.

,, 2 (right). Changing plumage.

Presented by Mr. Brownlow, Byker, 1890.

*Genus. SCOLOPAX.***34. Woodcock. *Scolopax rusticola*, Linn.**

No. 1 (left). FEMALE.

Arbour House, Durham, July 16th, 1831.

Presented by George Donald, Esq.

,, 2 (right). MALE. Shot on Tyneside, 1831.

,, 3 (front). Downy state.

Derwent Valley, Co. Durham, July, 1877.

35. Woodcock.

No. 1 (left). FEMALE. Wolsingham, Durham, Nov., 1884.

,, 2 (right). ,, ,, ,, ,,

*Presented by G. E. Crawhall, Esq., 1885.**Stuffed by R. Duncan.**Genus. GALLINAGO.***36. Great Snipe. *Gallinago major*, (Gmelin.)**

No. 1 (left). FEMALE. Northumberland, Sept. 1833.

,, 2 (centre). Bought in a Poulterer's shop in

Newcastle, Oct., 1842.

,, 3 (right). Shot at Beaufront near Hexham,

Sept. 25th, 1881.

Presented by L. W. Adamson, Esq.

37. Great Snipe.

No. 1 (left). Shot at Eshott near Felton, Northumberland,

Sept., 1872.

Presented by Geo. E. Crawhall, Esq., 1884.

No. 2 (right). Shot at Newton near Corbridge,

by James Harvey, Esq.

Presented by Miss Harvey, May 23rd, 1894.

CASE.

38. Common Snipe. *Gallinago gallinago*, (Briss.).

No. 1 (left). Downy state. Caithness.

Old Museum Collection.

Presented by Fred. Raine, Esq., 1877.

,, 2 (lower centre). Three YOUNG in downy state.

Hornby Park, presented by Anthony Savage, 1840.

,, 3 (upper centre). Changing from down to first feathers.

Elishaw Moss, Redesdale, Northumberland.

Presented by Richd. Howse, June 5th, 1875.

Remark.—In the crop was a Wireworm and the Caterpillar of a Noctua. J. H.

No. 4 (right). Northumberland, about the year 1840.

39. Jack Snipe. *Gallinago gallinula*, (Linnæus).

No. 1 (hind left). Northumberland, 1832.

,, 2 (centre). Hornby Park, Yorkshire.

Presented by Anthony Savage, 1860.

,, 3 (right).

Shot at Lorbottle, Northumberland, Dec., 1885.

Presented by Mr. George Noble.

,, 4 (front left). Represented as a dead bird.

*Genus. CALIDRIS.***40. Sanderling. *Calidris arenaria*, (Linn. ex Will.).**

No. 1 (front left). FEMALE. Summer plumage.

T. C. Heysham, Esq., Carlisle, 1834.

,, 2 (hind centre right). Changing from summer to winter.

Whitley Sands, August, 1846. C. M. Adamson.

,, 3 (hind centre left). Changing from summer to winter.

Northumberland Coast, 1835.

,, 4 (upper centre). Winter plumage.

Northumberland, Feb., 1836.

,, 5 (front right). YOUNG, first plumage.

Shot on Blyth Sands by R. R. Wingate

in company with J. Hancock, 1830.

CASE.

- No. 6 (hind right). First plumage. Redcar, Sept., 1883
Presented by Mr. Scott Wilson
- „ 7 (front centre). Summer plumage.
Burgh Marsh, Carlisle, May 30th, 1858.
C. M. Adamson in company with J. Hancock.
- „ 8 (upper right). MALE, summer plumage?
Shot at Whitburn, May 24th, 1855.
- „ 9 (hind left). St. Mary's Island, Sept. 1st, 1896.
Stuffed by J. Jackson. Presented by John Duncan.

*Genus. TRINGA.***41. Knot. *Tringa Canutus*, Brisson.**

- No. 1 (left). MALE. Northumberland, Aug. 10th, 1846.
Bought of Mr. Pape.
- „ 2 (lower left centre). FEMALE.
Shot on Wash, near Guyhorn, May 23rd, 1844.
Mr. Wm. Hircock, fenman.
- „ 3 (upper left centre). MALE. Summer.
Northumberland, August 10th, 1846.
Bought of Mr. Pape.
- „ 4 (upper right centre). MALE. Summer.
Newbiggin-by-the-Sea, Aug. 17th, 1882.
Presented by J. I. Maling.
- „ 5 (lower right centre). FEMALE.
Shot on the Wash, Guyhorn, May 23rd, 1844.
Mr. Wm. Hircock, fenman.
- „ 6 (right). MALE.
Shot on the Wash, Guyhorn, May 23rd, 1844.
Mr. Wm. Hircock, fenman.

Remark.—All the examples in this case are in summer plumage. J. H.

42. Knot.

- No. 1 (left). First plumage. Whitley Sands, 1836.
- „ 2 (centre). First plumage. Whitley Sands, 1836.

CASE

No. 3 (right). Winter plumage, except lesser coverts,
which belong to first plumage.
Newbiggin-by-the-Sea, 21st Jan., 1881.

Presented by E. O. Reid.

„ 4 (flying). MALE. Winter dress
St. Mary's Island, Feb. 22nd, 1894.

Stuffed by J. Jackson. Presented by John Duncan.

43. Purple Sandpiper. *Tringa maritima*, Brünn.

No. 1 (lower left). Summer plumage.

Hartley, Aug. 17th, 1830. Mr. G. Harvey.

„ 2 (left centre). MALE. Summer plumage, May, 1832.

„ 3 (hind centre). MALE. Summer plumage.
Davis Straits, 1839.

„ 4 (front centre). MALE. Summer plumage.
Davis Straits, 1839. Capt. Taylor.

„ 5 (hind right). MALE. Summer plumage.
Greenland, 1839.

„ 6 (front right). FEMALE. Parent of No. 7.

Taken on a hill 2,000 feet high, Faroe Islands,
by John Wolley, July, 1849.

Presented by J. Wolley, Esq.

„ 7 (inner front right). Young of No. 6.

Shot with the mother, July, 1849. J. Wolley.

„ 8 (on card). Downy state.

Presented by Edward Bidwell, Esq.

„ 9 (upper centre). YOUNG. Hartley Bates, Sept. 9, 1830.

Presented by W. C. Hewitson.

44. Pigmy Curlew. *Tringa subarquata*, Güld.

No. 1 (hind left). Winter plumage. Calcutta. E. Blyth.

„ 2 (hind centre). Summer plumage. Calcutta.
E. Blyth, 1848.

„ 3 (upper centre). FEMALE. Summer plumage.

Shot on Whittlesea Mere, May 17th, 1843.

Presented by H. W. Wheelwright, Esq.

CASE

No. 4 (front centre). Summer plumage.

Cargo Fleet, Durham.

Shot by — Sutton, Elton Hall, 1850.

Presented to J. Hancock, July 9th, 1875.

„ 5 (hind right). First plumage.

Shot by C. M. Adamson, Esq., on the Newcastle

Town Moor, Sept. 7th, 1836.

„ 6 (front right). First plumage.

Shot by P. Stanton on the sands north of Blyth,

Sept., 1843.

„ 7 (front left). St. Mary's Island, Sept. 1st, 1896.

Stuffed by J. Jackson.

Presented by John Duncan.

**45. Dunlin. *Tringa cinclus*, Linn. ex Brisson.
et *Tringa alpina*, Linn.**

No. 1 (front left). First plumage.

Presented by Edw. Bidwell, Esq., Sept., 1883.

„ 2 (left centre lower). Summer plumage. Northd., 1832.

„ 3 (hind centre). First plumage.

Shot by W. C. Hewitson, Esq., St. Mary's Island,
near Hartley, Sept., 1830.

„ 4 (hind right). FEMALE. Winter plumage.

Northumberland, Jan., 1832.

„ 5 (hind right centre). Winter plumage.

Northumberland, Jan., 1832.

„ 6 and 7 (front). Downy state.

„ 8 (flying). Winter plumage. Holy Island, Dec., 1888.

Stuffed by J. Jackson. Presented by J. D. Walker, Esq.

„ 9 (hind left). Changing from summer to winter.

Redcar, Sept., 1892.

Stuffed by J. Jackson.

Purchased Oct., 1892.

„ 10 (front centre). St. Mary's Island, Sept. 1st, 1896.

Stuffed by J. Jackson.

Presented by John Duncan.

„ 11 (front right). MALE. In summer plumage nearly.

St. Mary's Island, May 30th, 1894.

Stuffed by J. Jackson.

Presented by John Duncan.

CASE

46. Little Stint. *Tringa minuta*, Leisler.

No. 1 (front left). Downy state.

Dovinik, Valley of the Lower Petchora, Russia.

Hy. Seebohm and Harvey Brown, July 22nd, 1875.

„ 2 (front left). First plumage.

Burgh Marsh, Sept. 18th, 1839.

„ 3 (hind left). First plumage. Prestwick Car, 1837.

„ 4 (front centre). First plumage. Hartley, Sept., 1834.

C. M. Adamson, Esq.

„ 5 (flying). First plumage.

Burgh Marsh, Sept. 18th, 1839.

„ 6 (hind right). Summer plumage.

Sweden, Aug. 18th, 1850. H. W. Wheelwright.

„ 7 (front right). Winter plumage. Darjeeling, India.

Presented by Hy. Seebohm, Esq., Sept., 1886.

47. Temminck's Stint. *Tringa Temminckii*, Leisl.

No. 1 (front left). First plumage.

„ 2 (hind left). First plumage. Town Moor, N C., 1835.

„ 3 (front centre). First plumage. Prestwick Car, 1832.

„ 4 (lower right). First plumage. Northd., 1843.

„ 5 and 6 (hind centre). Winter plumage.

Calcutta, 1848. E. Blyth.

„ 7 (middle right). Shewing summer and winter plumage.

Berwick Hill, near Prestwick Car, Northd.

Mr. R. Reay, June 18th, 1839.

„ 8 (hind right). Shewing summer and winter plumage.

France.

„ 9 (front right). Downy state. July 16th, 1880.

Edw. Bidwell.

**48. Schinz's Sandpiper. *Tringa Schintzii*, Bonap.
= *fuscollois*, Vieill.**

Nos. 1, 2, 3, 4. All in first plumage.

All from Davis Straits, 1840.

Remark.—This species is now better known as Bonaparte's Sandpiper, *Tringa ruficollis*, Vieillot.—Ed.

CASE.

- 49. Pectoral Sandpiper. *Tringa maculata*, Vieillot.**
 No. 1 (left). First plumage, 1885.
 „ 2 (right). First plumage. Edw. Bidwell, Esq., 1887.

- 50. Broad-billed Sandpiper. *Tringa platyrhyncha*, Temm.**
 No. 1 (front left). First plumage. Sweden, 1861.
 „ 2 and 3 (left centre). Winter plumage.
 Calcutta, 1848. E. Blyth.
 „ 4 (right). Downy state. Presented by Edw. Bidwell.

Genus. MACHETES.

- 51. Ruff. *Machetes pugnax*, (Linnæus).**
 No. 1 (left). MALE. Summer plumage.
 Whittlesea, on the Wash, May 13th, 1843.
 H. W. Wheelwright.
 „ 2 (centre). MALE. Summer plumage.
 Bought in London, 1840.
 „ 3 (hind right). FEMALE. Summer plumage.
 Prestwick Carr, 1834.
 „ 4 (front right). MALE. Summer plumage, not having
 acquired the ruff, April 18th, 1840 Mr. R. Reay.
 „ 5 (front centre). Downy state.
 Edw. Bidwell, Esq., Aug. 27th, 1881.
- 52. Ruff.**
 No. 1 (front left). MALE. Summer plumage.
 Whittlesea Mere, on the Wash, May 16th, 1842.
 H. W. Wheelwright.
 „ 2 (hind left). MALE. Summer plumage.
 Whittlesea Mere, on the Wash, May 16th, 1843.
 H. W. Wheelwright.
 „ 3 (hind right). MALE. Summer plumage.
 Guyhorn, 17th May, 1842.
 From Wm. Hircock, fenman.
 „ 4 (front right). FEMALE. Summer plumage.
 Whittlesea, on the Wash, May 17th, 1843.
 H. W. Wheelwright.

CASE

53. Ruff.

No. 1 (front left). MALE. Winter plumage.

Shot at Prestwick Carr, Nov. 26th, 1841.

Presented by R. Reay, Esq.

,, 2 (upper left). FEMALE. Winter plumage.

,, 3 (centre). MALE. First plumage.

Town Moor, Newcastle, Sept., 1836. J. H.

,, 4 (right). FEMALE. First plumage.

Town Moor, Newcastle, Sept., 1836. J. H.

,, 5 (upper right). FEMALE. First plumage.

Prestwick Carr.

54. Empty Case.*Genus. RECURVIROSTRA.***55. Avocet. *Recurvirostra avocetta*, Linn.**

No. 1 (right). Bought specimen.

,, 2 (left). Downy state. July 15th, 1878.

Fred Raine, Esq.

56. Empty Case.*Genus. HIMANTOPUS.***57. Black-winged Stilt. *Himantopus candidus*,**

Bonnat.

= *melanopterus*, Meyer.

No. 1 (right). From Old Museum.

,, 2 (left). From Old Museum.

Presented by the Rev. John Bigge.

These to be replaced by better specimens, J. H.

,, 3 (centre). France.

J. Hancock Collection.

58. Empty Case.*Genus. TOTANUS.***59. Greenshank. *Totanus griseus*, (Brisson).**,, ***glottis*, (Linn.).**

No. 1 (left). Summer plumage.

Pegwell Bay. C. M. Adamson.

CASE.

- No. 2 (upper centre right). Summer plumage.
 Pegwell Bay. C. M. Adamson.
 ,, 3 (lower). Downy state. July 7th, 1881.
 Presented by F. Raine, Esq., 1885.
 ,, 4 (right). First plumage.
 Prestwick Carr, Aug. 18th, 1831.
 ,, 5 (lower centre right). First plumage.
 Whitley Sands, Sept., 1843.
 Presented by C. M. Adamson, Esq.

60. Spotted Redshank. *Totanus fuscus*, (L. ex Briss.).

- No. 1 (left). FEMALE. Summer plumage.
 Dieppe, 1844. J. Hardy.
 ,, 2 (centre). MALE. Summer plumage.
 Dieppe, 1844. J. Hardy.
 ,, 3 (right). Downy state. Edw. Bidwell, 1885.

61. Spotted Redshank.

- No. 1 (left). First plumage.
 St. Mary's Island, Hartley, Aug. 26th, 1831.
 ,, 2 (centre). First plumage.
 Prestwick Carr, Aug. 16th, 1850.
 Shot by Mr. Rd. Reay.
 ,, 3 (right). Winter plumage. Calcutta, 1848.
 Mr. E. Blyth.

62. Redshank. *Totanus calidris*, (Linn.).

- No. 1 (left). YOUNG. First plumage.
 Near Haydon Bridge, 9th July, 1898.
Stuffed by J. Jackson. Presented by G. E. Crawhall, Esq.
 ,, 2 (right). YOUNG. Downy state.
 Prestwick Carr, May 21st, 1846.

CASE

63. Redshank. *Totanus calidris*, (Linn.).

No. 1 (left). FEMALE. Winter plumage. Dec. 26th, 1829.

,, 2 (hind centre). FEMALE. Summer plumage.

Bought in a Poulterer's shop in Newcastle, May, 1872.

,, 3 and 4 (right). First plumage.

Newbiggin-by-the-Sea, Aug. 10th, 1832.

,, 5 (front centre). Changing to summer plumage.

Shot near Alnwick, Northumberland, April 17th, 1836.

Presented by Mr. Thompson, Newcastle.

64. Wood Sandpiper. *Totanus glareola*, (Gmelin).

No. 1 (left). MALE, in summer plumage.

This bird belonged to a nest taken by John Hancock at Prestwick Carr, June 3rd, 1853.

Remark.—The nest with four eggs is in a Cabinet in the Museum. This was the first recorded nest of this species taken in England. J. H.

No. 2 (hind left). First plumage. Prestwick Carr.

Mr. Rd. Reay, Berwick Hill, Aug., 1837.

,, 3 (flying). Summer plumage. Calcutta, 1848.

Mr. E. Blyth.

,, 4 and 5 (right). First plumage. Prestwick Carr.

Shot by Thos. Atthey, Aug. 4th, 1832.

,, 6 (front centre). Downy state.

Alexievka, June 30th, 1875.

Henry Seebohm and Harvey Brown, Esqrs.

,, 7 (centre). Downy state. Muonioniska, June 25th, 1878.

Presented by Fred. Raine, Esq.

65. Green Sandpiper. *Totanus ochropus*, (Linn.).

No. 1 (left). Winter plumage.

Brampton, Cumberland, Dec., 1842.

,, 2 (upper left). Summer plumage.

Streatlam Park, summer of 1838.

Presented by Mr. Smurthwaite, Staindrop.

CLARK

No. 3 (upper centre). First plumage.

Found dead at Jesmond, Aug. 19th, 1865.

Presented by C. M. Adamson, Esq.

,, 4 (right). MALE. First plumage.

Ouseburn, July 25th, 1836.

Presented by George Freeman, Esq.

,, 5 (right centre). First plumage).

Richmond, Yorkshire, Aug. 10th, 1840.

,, 6 (left centre). First plumage.

Beaumont Marshes, Essex, Sept. 19th, 1898.

Presented by B. A. Wilson, 1881.

,, 7 (centre right). Downy state.

Sweden, 1861. H. W. Wheelwright.

,, 8 (centre left). Downy state. Gardö, July 30, 1863.

Edw. Bidwell, Esq., Aug., 1881.

66. Common Sandpiper. *Totanus hypoleucos*,

(Linn.).

No. 1 (lower centre). FEMALE, mature.

Teams, Co. Durham, May, 1834.

,, 2 (upper centre). First plumage. July 17th, 1871.

,, 3 (right). First plumage.

Cullercoats, 1830. Robert Burnett.

,, 4 (front centre). Downy state. Perthshire, July, 1882.

Presented by Hy. Tuke Mennell.

,, 5 (left). Downy state.

Accidentally killed at Woolsington, Northumberland,

June, 1895.

*Presented and Stuffed by J. Jackson.**Genus. PHALAROPUS.***67. Grey Phalarope. *Phalaropus fulicarius*,**

(Linn.).

,, 1 (centre left). FEMALE. Summer plumage.

Davis Straits, 1836. Presented by Capt. Taylor.

,, 2 (centre right). MALE. Summer plumage.

Davis Straits, 1836. Presented by Capt. Taylor.

CASE

- No. 3 (upper centre). Changing plumage from young to winter. Northumberland coast, 1837.
 „ 4 (centre front). MALE, mature. Davis Straits, 1837.
 Presented by Capt. Taylor.
 „ 5 and 6 (right). Changing from first plumage to winter. Newton, Northumberland Coast.
 Presented by P. G. Forster, Esq.
 „ 7 (left). FEMALE? Summer plumage.
 Locality unknown.
Presented by James Pool, March 27th, 1896.

68. Red-necked Phalarope. *Phalaropus hyperboreus*, (Linn.).

- No. 1 (left). First plumage. Cullercoats, Nov. 22, 1838.
 „ 2 (centre lower). First plumage.
 South Shields, Co. Durham.
 „ 3 (upper front centre). FEMALE, mature.
 Summer plumage. Iceland, 1836.
 „ 4 (hind upper centre). MALE, mature. Iceland, 1836.
 Received from Wm. Proctor, Durham.
 „ 5 (front) Downy state.
 Dvoinik, Lower Petchora, Russia.
 Hy. Seebohm and Harvey Brown, 25th July, 1871.
 „ 6 (right). Shot at St. Mary's Island, Dec., 1872.
Stuffed by John Jackson.
Presented by John Duncan, Dec. 7th, 1892.

Fam. RALLIDÆ.

Genus. RALLUS.

69. Water Rail. *Rallus aquaticus*, Brisson.

- No. 1 (lower centre). FEMALE. Ravensworth, 1836.
 „ 2 (upper centre). Sex not determined. 1828.
 „ 3 (right). YOUNG. Shot in the summer of 1836.
 „ 4 (right). Downy state. Norfolk, May 2nd, 1884.
 Presented by R. W. Chase, Esq.
 „ 5 (left). MALE. Near Tynemouth, Nov. 12th, 1895.
Stuffed by J. Jackson. Presented by John Duncan.

CASE.

*Genus. PORZANA.***70. Spotted Crake. *Porzana maruetta*, (Brisson).**

No. 1 (left). **MALE.** Found washed up on the sands at
Newbiggin-by-the-Sea, by John Hancock, Sept., 1871.

„ 2 (upper). Stuffed before dates were kept, about 1825.

„ 3 (right). Downy state.

Presented by Edw. Bidwell, 1882.

71. Baillon's Crake. *Porzana Baillonii*, Vieill.

No. 1 (left). Shot on the Derwent near Swalwell,

July 12th, 1874.

Remark.—Obtained the same year from Mr. Scott, of
Blaydon. J. H.

No. 2 (upper). **YOUNG.**

From J. Hardy, of Dieppe, July, 1847.

„ 3 (right). Calcutta. E. Blyth, 1848.

72. Little Crake. *Porzana parva*, Scop.

„ ***minuta*, Pallas.**

No. 1 (left). **MATURE FEMALE.** South of Russia.

„ 2 (right). **MATURE MALE.** „ „

Stuffed by J. Jackson.

Purchased July, 1899.

*Genus. CREX.***73. Land Rail. *Crex pratensis*, Bechstein.**

No. 1 (front left). Downy state. Old Museum.

„ 2 (hind centre). **FEMALE.** Northumberland, July, 1882.

Presented by E. O. Reid.

„ 3 (front centre). Sex not determined, 1827.

Remark.—One of the earliest stuffed by J. Hancock.

„ 4 (right). Nest and Young in down.

Stuffed by J. Hancock.

„ 5 (hind left). **MALE, mature.**

Jesmond, May 28th, 1891.

Stuffed by J. Jackson.

Presented by John Duncan.

„ 6 (right). **YOUNG.** First plumage.

Near Newcastle, July 13th, 1891.

Stuffed by John Jackson.

Presented by John Duncan.

CASE

*Genus. GALLINULA.***74. Moorhen. *Gallinula chloropus*, (Linn.).**

No. 1 (left), FEMALE.

,, 2 (right). First plumage. Presented by Hannah Hope.

,, 3 and 4 (right front). Downy state.

From Old Museum Collection.

75. Moorhen or Waterhen.

No. 1 (left). FEMALE, mature.

,, 2 (right). MALE, mature.

,, 3 (front). YOUNG, in downy state.

All from Woolsington, near Newcastle.

Stuffed by J. Jackson.

Purchased.

*Genus. FULICA.***76. Coot. *Fulica atra*, Linn.**No. 1. MALE. Shot from Tyne Bridge by T. Mowbray in
the presence of John Hancock, about the year 1829.**77. Coot.**

No. 1 (left) FEMALE. Near Haydon Bridge, Aug., 1897.

,, 2 (right). MALE. Near Haydon Bridge, Aug., 1897.

*Both presented by Geo. E. Crawhall, Esq.**Stuffed by J. Jackson.***78. Coot.**

No. 1 and 2. (left and right). Downy state.

Prestwick Car, 1835.

,, 3 (front centre). Downy state.

Northumberland, June 18th, 1876.

Presented by Thomas Thompson, Esq.

,, 4 (centre). YOUNG. First plumage.

Stuffed by J. Jackson. Haydon Bridge, Aug., 1898.*Presented by Geo. E. Crawhall, Esq.*

CASE

Fam. GRUIDÆ.

Genus. *GRUS*.79. Crane. *Grus cinerea*, Bechstein.

No. 1. MALE. From Old Museum Collection.

,, 2. Two Young in the down.

Taken at Fokstuen Dovrefjeld, Norway,

June 5th, 1883, by Fred. Raine.

Presented by Fred. Raine, Esq.

80. Crane.

Shot at Dyke House Farm on the Hart Estate,

Hartlepool, May, 1865, by Mr. J. Smith.

Presented by J. E. Robson, Esq., Hartlepool, May, 1876.

From the Old Museum Collection.

Fam. CICONIIDÆ.

Genus. *CICONIA*.81. White Stork. *Ciconia alba*, Brisson.

No. 1 (left). Old Museum Collection.

Black Stork. *Ciconia nigra*, Linn.

No. 2 (right). Old Museum Collection.

Fam. PLATALEIDÆ.

Genus. *PLATALEA*.82. Spoonbill. *Platalea leucorodia*, Linn.

No. 1 (left). MALE, mature.

Shot at Holy Island, May, 1857.

Presented by Edmund Crawshay, Esq., Sept., 1883.

,, 2 (right). FEMALE. Dalton Sands, near Ulverston, 1883.

Presented by Mr. Losh.

,, 3 (centre). Downy state.

Presented by Edward Bidwell, Esq., 1883

Fam. ARDEIDÆ.

Genus. *ARDEA*.83. Heron. *Ardea cinerea*, Linn. ex Brisson.MALE. Shot by Capt. Cumming, of Altyre, at the Herony.
on the Findhorn, March 8th, 1850.

CASE

84. Heron.

No. 1 (left). FEMALE. Shot by Capt. Cumming, of Altyre,
at the Herony on the Findhorn, March 8th, 1850.

„ 2 (centre). Downy state.

Buscot Park, near Farringdon, Berks., Feb., 1884.

Presented by John Young.

No. 3 (right). Downy state. Shewing first feathers.

Scotland, April 26th, 1885.

Presented by Alex. Stevenson, Esq.

85. Purple Heron. *Ardea purpurea*, Linn.

No. 1. IMMATURE. Shot in the North of France.

From Joseph Hardy, Dieppe, 1852.

86. Purple Heron.

No. 1 (left). FEMALE, mature.

„ 2 (right). MALE, mature.

Both from Joseph Hardy, Dieppe, 1852.

87. Little Egret. *Ardea gazetta*, Linn.

No. 1. Bought of a dealer at Leeds, 1831.

88. Buff-backed Heron. *Ardea bubulcus*, Adouin.

***Bubulcus Ibis*, D.G. ii., 298.**

No. 1 (left). FEMALE. Merzapore, India.

W. E. Brooks, Esq., 1863.

„ 2 (centre). MALE. Shot at Marismas de Donana,

Spain, May 5th, 1883.

Presented by Abel Chapman, Esq.

Squacco Heron. *Ardea ralloides*, Scop.

***Buphus comatus*, D.G. ii., 301.**

No. 3. (right). MALE. From A. H. Cochrane, Esq., 1850.

CASE

*Genus. ARDETTA.***89. Little Bittern. *Ardetta minuta*, (Linn.).**

No. 1 (left). MALE. Shot at Blagdon, Northumberland,
May 12th, 1810.

Presented by Sir M. W. Ridley, Bart.
From Old Museum Collection.

Remark.—This is the specimen from which Bewick made
his woodcut. J. H.

Nos. 2 and 3 (upper centre). MALE.

Both shot at Abbeville. France, about the year 1830.

„ 4 (hind centre). First plumage.

Remark.—This bird was kept alive by J. Hancock.

„ 5 (inner left). First plumage.

This bird was caught by a dog on the River Petterel,
Carlisle, 1850.

Presented by Mr. Losh.

„ 6 (right). First plumage.

Killed at Gateshead against telegraph wires,

Oct. or Nov., 1889.

Presented by Mr. Wm. Brack, S. Byker, June, 1891.

Stuffed by J. Jackson.

„ 7 and 8 (front centre). Downy state.

Presented by Edward Bidwell, Esq., 1883.

*Genus. BOTAURUS.***90. Bittern. *Botaurus stellaris*, (Linn.).**

No. 1 (left). Shot at Gosforth Lake, near Newcastle,
Nov. 10th, 1863.

Presented by Mrs. Eustace Smith.

„ 2 (right). Shot at Bedlington, Northumberland,
about 1833.

„ 3 (middle). Downy state.

Presented by Edward Bidwell, Esq., 1883.

91. Night Heron. *Nycticorax griseus*, (Brisson).

From M. Brunel of Dieppe, about the year 1830,

CASE

Fam. TANTALIDÆ.

92. Glossy Ibis. *Plegadis falcinellus*, (Linn.).

No. 1 (left). From Old Museum Collection.

,, 2 (right). Shot at Gibraltar Point, Lincolnshire, by a
Coastguardman, Aug., 1881. One of three
shot at the same time.Received through the kindness of Capt. H. C. St. John
R.N., Feb. 3rd., 1885.

93. Glossy Ibis.

No. 1 (right). MATURE.

,, 2 (left). Downy state.

District of the Volga, Russia, July 8th, 1878.

ORDER. PALMIPEDES.

Fam. PELECANIDÆ.

Genus. *PHALACROCORAX*.1. Cormorant. *Phalacrocorax carbo*, (Linn.)

No. 1 (left). MALE, mature. Northumberland.

From Old Museum Collection.

,, 2 (right). FEMALE? Newton-by-the-Sea, Sept., 1895.

Stuffed by J. Jackson. Presented by John Duncan.

2. Cormorant.

No. 1. FEMALE, immature.

Newton-by-the-Sea, Jan. 1st, 1895.

Stuffed by J. Jackson. Presented by John Duncan.

3. Cormorant.

No. 1. IMMATURE. From Old Museum Collection.

4. Cormorant.

No. 1. FEMALE, mature.

Seaton Sluice, St. Mary's Island, Northumberland,

Nov. 20th, 1893.

Stuffed by J. Jackson. Presented by John Duncan

CASE

5. Shag. *Phalacrocorax graculus*, (Linn.).

No. 1 (upper left). MALE.

Northumberland Coast about the year 1845. J. H.

,, 2 (right). MALE. From Old Museum Collection.

Stuffed by R. R. Wingate.

,, 3 (lower left). First plumage. Northumberland Coast.

Purchased Feb., 1889.

6. Empty Case for Shag.

*Genus. SULA.*7. Gannet. *Sula Bassana*, Brisson.

No. 1 (left). MATURE. Northumberiand Coast.

,, 2 (right). FEMALE, mature. Bass Rock.

Presented by Mr. Robt. Robson, March, 1884.

Remark.—Altered in the stuffing by J. Hancock.

8. Gannet.

No. 1 (left). YOUNG. First plumage.

Northumberland Coast, 1870. J. Hancock fecit.

,, 2 (right). MATURE plumage nearly completed.

From Old Museum Collection.

9. Gannet.

No. 1 (centre). Shewing first feathers.

Bass Rock, July, 1880.

,, 2 (right). Perfect downy state. Bass Rock, July, 1880.

,, 3 (left and upper). Very early downy state.

Bass Rock, July, 1880. Per R. Howse.

From Old Museum Collection.

Fam. PROCELLARIDÆ.

*Genus. FULMARUS.*10. Fulmar. *Fulmarus glacialis*, (Linn.).

No. 1 (left). Found dead on the sea beach at Whitburn,

Co. Durham, in 1852.

,, 2 (right). Found washed up on the coast of

Northumberland about 1852.

CASE

11. Fulmar.

No. 1 (right). MALE, mature.

Caught alive at Marske-by-the-Sea, Yorkshire,

Sept. 30th, 1894.

Purchased from Mr. Pearce Coupe.

„ 2 (left). MALE, mature.

Washed ashore at Marske-by-the-Sea, Oct. 7th, 1894.

Stuffed by J. Jackson. Purchased of Mr. Pearce Coupe.

Genus. PUFFINUS.

12. Great Shearwater. *Puffinus major*, Faber.

No. 1. MATURE.

Presented by Geo. C. Atkinson about the year 1830.

From Old Museum Collection.

13. Sooty Shearwater. *Puffinus griseus*, Gmelin.

No. (left). Shot on sea coast near Newbiggin-by-the-Sea,

by J. I. Maling, Esq., Sept., 1897.

Presented by W. E. Beck, Esq., 28th May, 1898.

Restuffed by J. Jackson.

No. 2 (right). Received from J. Hardy, Dieppe, 1849. J. H.

Stuffed by J. Jackson.

14. Manx Shearwater. *Puffinus Anglorum*,

(Temmin.).

No. 1 (upper left, swimming). Orkney.

Presented by John Hancock.

From Old Museum Collection.

„ 2 (right, swimming). Orkney.

Presented by John Hancock.

From Old Museum Collection.

„ 3 (lower right). Downy state. Orkney, 1854.

John Hancock.

„ 4 (middle left). MALE, mature.

Isle of Eigg, Hebrides, June, 1888

CASE

No. 5 (centre front). First plumage, partly downy.

Isle of Eigg, Hebrides, Aug., 1888

,, 6 (lower left). Downy state.

Isle of Eigg, June 9th, 1888.

All these presented by Thos. Thompson, Esq.

Remark.—Nos. 4, 5, and 6 skinned by J. Jackson and stuffed
by John Hancock at Oatlands.—J.H.

Genus. *THALASSIDROMA.*

15. Storm Petrel. *Thalassidroma pelagica*, (Linn.).

No. 1 (left front). Downy state.

,, 2 (hind left). Cullercoats, June 20th, 1836.

,, 3 (right, flying). Found dead on Northumberland
Coast, Oct. Presented by Mr. Murray.

,, 4 (flying, upper). Shot on the Northd. Coast, 1837.

,, 5 (centre). Washed up at Marske-by-the-Sea, Nov.,
1893.

Presented by Mr. Pearce Coupe.

**16. Wilson's Petrel. *Thalassidroma oceanica*,
(Kuhl).**

Nos. 1 and 2 (left). Coast of Newfoundland.

Captain Taylor, 1837.

**Bulwer's Petrel. *Thalassidroma Bulweri*,
Jardine.**

No. 3 (right). From Old Museum Collection.

**17. Leach's Petrel. *Thalassidroma leucorhoa*,
(Vieillot).**

No. 1 (lower centre). Shot near Blyth, 1837.

,, 2 (upper centre). Taken off nest on St. Kilda, 1847,
by D. W. Graham.

,, 3 (right centre, upper). Taken on the Tyne 300 yards
above the Old Bridge, Newcastle, 1830.

,, 4 (front centre). Killed against telegraph wires
near Brandling Park, Oct., 1882.

Stuffed by J. Jackson. Presented by Rd. Howse, 1893

CASE

No. 5 (left). Marske-by-the-Sea.

„ 6 (right). „ „

„ 7 (flying). „ „

Remark.—The three last were driven by storm on the shore at Marske-by-the-Sea, and taken alive Nov. 20th and 21st, 1893. Ed.

Stuffed by J. Jackson. Purchased from Mr. Pearce Coupe.

Fam. LARIDÆ.

18. Common or Great Skua. *Stercorarius catarractes*, (Linn.).

Presented by Geo. Clayton Atkinson, Esq.

19. Great Skua.

No. 1. First plumage.

Shot at Newton-by-the-Sea, Northd., Oct., 1833.

Presented by Mr. W. Forster.

20. Pomarine Skua. *Stercorarius pomarinus*,
(Temm.).

No. 1. FEMALE, mature. Tynemouth.

Shot Sept. 14th, 1846.

„ 2. IMMATURE. Newbiggin-by-the-Sea.

Shot by Mr. E. O. Reid, 1893.

Stuffed and presented by J. Jackson.

21. Pomarine Skua.

No. 1 (left). Young in first plumage.

Newbiggin-by-the-Sea, 1834.

„ 2 (right). Almost mature plumage.

Prestwick Carr, near Newcastle, Feb., 1889.

Presented by W. E. Beck, Esq.

22. Richardson's Skua. *Stercorarius parasiticus*,
(Linn.).

No. 1 (right). MALE, mature. St. Mary's Island, Oct., 1893.

Presented by J. Duncan.

CASE

- No. 2 (centre). MALE, mature. Dark variety.
 St. Mary's Island, Sept. 24th, 1895.
Presented by Mr. H. Dawson.
 ,, 3 (left). FEMALE, mature. Light variety.
 St. Mary's Island, Sept. 24th, 1895.
All stuffed by J. Jackson. Presented by Mr. H. Dawson.

23. Richardson's Skua.

- No. 1 (lower centre). Pale complexion.
 Tynemouth, July, 1835.
 ,, 2 (upper centre). Pale complexion. Changing plumage.
 Shot end of August, 1835.
 ,, 3 (upper right). FEMALE. Dark complexion.
 Newbiggin, end of August, 1835.
 ,, 4 (lower right). Downy state. June 9th, 1882.
 Stuffed by John Hancock.
 Presented by Fred. Raine, Esq.
 No. 5 (left). MALE, immature.
 St. Mary's Island, Oct. 14th, 1893.
Stuffed by John Jackson. Presented by John Duncan.

24. Richardson's Skua.

- No. 1 (centre). MALE. Very dark complexion.
 St. Mary's Island, Sept. 6th, 1896.
Presented by John Duncan.
 ,, 2 (left). Downy state. Orkney, July, 1895.
Presented by Major Ernest Anne.
Both stuffed by J. Jackson.

25. Arctic or Buffon's Skua *Stercorarius longicaudus*, Brisson.

- No. 1 (lower centre). MATURE.
 Shot at Whitburn, Oct. 24th, 1837.
 ,, 2 (upper centre). MALE, young. First plumage.
 Shot at Tynemouth, Sept., 1841.
 Presented by C. M. Lister, jun., Esq.

CASE

„ 3 (right). First plumage.

Shot at Newbiggin by T. Robson, Sept., 1840.

„ 4 (left). IMMATURE, changing plumage.

Found dead at Shotley Bridge, Oct. 31st, 1891.

Stuffed and presented by John Jackson.

Genus. LARUS.

26. Glaucous Gull. *Larus glaucus*, Brünn.

No. 1. YOUNG, in first plumage.

Presented by George Burnett, jun., Esq.

27. Glaucous Gull.

No. 1. MALE, immature. Changing plumage.

Newton-by-the-Sea, Oct., 1892.

Shot, stuffed and presented by John Jackson, Nov., 1892.

28. Glaucous Gull.

No. 1. FEMALE, mature. Winter plumage.

Shot near Alnwick, Feb., 1837.

29. Glaucous Gull.

No. 1 (left). Downy State.

„ 2 (right). Summer plumage. Davis Straits, 1834.

Presented by John Hancock.

From Old Museum Collection.

30. Great Black-backed Gull. *Larus marinus*,

Linn.

No. 1. YOUNG. First plumage.

Presented by Mr. Moffatt, Twizell.

31. Great Black-backed Gull.

No. 1. MATURE. Winter plumage.

Newton-by-the-Sea, 1833.

Presented by W. Forster, Esq.

CASE

32. Great Black-backed Gull.

No. 1. MALE, mature. Winter plumage.

Fenham Flatts, North Northd., 27th Nov., 1895.

Stuffed by J. Jackson. Presented by Mr. John Duncan.

33. Great Black-backed Gull.

No. 1 (centre). FEMALE. Winter plumage.

Newton-by-the-Sea, Oct., 1892.

Shot, stuffed and presented by J. Jackson, Nov., 1892.

„ 2 (left). YOUNG. Downy state.

Brora, Sutherland.

Stuffed and presented by Alex. Yellowley, S. Shields,

Feb., 1893.

34. Lesser Black-backed Gull. *Larus fuscus*,

Linn.

No. 1 (left). FEMALE. First plumage.

St. Mary's Island, Northd. Coast, Sept., 1891.

Presented by John Duncan.

„ 2 (right). IMMATURE. First plumage.

St. Mary's Island, Sept., 1891.

Stuffed by J. Jackson.

Presented by John Duncan.

35. Lesser Black-backed Gull.

No. 1. FEMALE, immature.

Northumberland Coast, May, 1891.

Stuffed by J. Jackson.

36. Lesser Black-backed Gull.

No. 1 (right). Downy state.

Stuffed and presented by Fred. Raine, Esq.,

Feb., 1878.

From Old Museum Collection.

„ 2 (left). FEMALE, mature.

Whitley, May 19th, 1893. Purchased.

Stuffed by J. Jackson.

„ 3 (hind right). IMMATURE, about 3 years old.

Found dead at Hebburn, Aug. 2nd, 1876. J. H.

CASE

37. Lesser Black-backed Gull.

No. 1. FEMALE, mature. Northd. Coast, May, 1891.

*Stuffed by J. Jackson. Presented by Mr. John Duncan.***38. Herring Gull. *Larus argentatus*, Brünn.**

No. 1 (hind left). FEMALE? immature.

Newton-by-the-Sea, Jan. 2nd, 1895.

Stuffed by J. Jackson. Presented by John Duncan.

,, 2 (left). Downy state (Herring Gull?).

Farne Islands. From Old Museum Collection.

Presented by Richard House.

,, 3 (right). IMMATURE.

St. Mary's Island, Nov. 9th, 1895.

*Stuffed by J. Jackson. Presented by Mr. John Duncan.***39. Herring Gull.**

No. 1 (left). IMMATURE. Shot near Kyloe, Northd.

*Presented by John Duncan, Sept., 1891.**Stuffed by J. Jackson.*

,, 2 (right). IMMATURE.

Shot near Kyloe, Northumberland, Sept., 1891.

*Stuffed by J. Jackson. Presented by John Duncan.***40. Herring Gull.**

No. 1 (right). FEMALE, immature.

Northumberland Coast, May, 1891.

Presented by John Duncan.

,, 2 (left). IMMATURE.

Whitley, Northumberland Coast, May 19th, 1893.

*Both stuffed by J. Jackson.**Purchased.***41. Herring Gull.**

No. 1 (left). Winter, nearly mature.

St. Mary's Island, Jan., 1897.

Presented by Mr. John Duncan.

,, 2 (right). IMMATURE. St. Mary's Island, Sept., 1896.

*Presented by Mr. John Duncan.**Both stuffed by J. Jackson.*

CASE

42. Iceland Gull. *Larus leucopterus*, Faber.

No. 1 (left). FEMALE, immature.

Newton-by-the-Sea, Jan. 7th, 1895.

Purchased of John Duncan.

„ 2 (right). IMMATURE. Winter plumage.

Shot near mouth of Howick Burn, Dec., 1892.

Purchased of John Duncan, Feb., 1895.

Both stuffed by J. Jackson.

43. Common Gull. *Larus canus*, Linn.

No. 1 (front centre). FEMALE, winter.

About the year 1829. J. H.

„ 2 (hind left). MALE, mature. Winter plumage.

St. Mary's Island, Feb. 22nd, 1894.

Stuffed by J. Jackson. Presented by John Duncan.

„ 3 (front left). Downy state.

Stuffed and presented by Fred. Raine, Esq., 1876.

From Old Museum Collection.

„ 4 (right). First plumage.

Hebburn Reservoir, near Newcastle.

Presented by J. S. Forster, Esq., Oct., 1888.

Stuffed by J. Jackson, 1891.

„ 5 (back centre). IMMATURE.

Monkseaton, Jan. 26th, 1895.

Stuffed by J. Jackson. Presented by John Duncan.

44. Kittiwake. *Larus (Rissa) tridactylus*, Linn.

No. 1 (lower centre). YOUNG. First plumage.

„ 2 (hind right). MATURE. Summer plumage.

„ 3 (upper centre). MATURE. Winter plumage.

„ 4 (left). MATURE. Winter plumage.

St. Mary's Island, Northd., 18th Nov., 1893.

Stuffed by J. Jackson. Presented by John Duncan.

„ 5 (front right). YOUNG, changing to winter.

St. Mary's Island, Northd., Oct. 2nd, 1893.

Stuffed by J. Jackson. Presented by John Duncan.

CASE

45. Ivory Gull. *Larus (Pagophila) eburneus*,

Phipps.

No. 1 (centre). MATURE. Summer? Davis Straits, 1834.

,, 2 (left). MATURE. Spitzbergen, 1881.

,, 3 (right). IMMATURE. ,, 1881.

Nos. 2 and 3 presented by Abel Chapman, Esq.

46. Sabine's Gull. *Larus (Xema) Sabinii*,

J. Sabino.

No. 1 (left). MALE, immature.

Shot near Seaham Harbour, Co. Durham,

Oct. 10th, 1879.

Stuffed by Fred. Raine, Esq.

Purchased.

,, 2 (right). MATURE. Summer plumage.

Davis Straits.

*Presented by R. N. Kerr, Esq., Dundee, Feb. 5th, 1895.**Stuffed by J. Jackson.***47. Little Gull. *Larus minutus*, Pallas.**

No. 1 (left). MALE, mature. Summer plumage.

Stromness. Received from Mr. Dunn, 1870. J. H.

,, 2 (upper right, flying). MATURE. Winter.

Whitburn, Co. Durham, Dec. 27th, 1876. J. H.

,, 3 (lower right). YOUNG, changing into winter plumage.

Presented by J. H. Gurney, jun., Esq. J. H.

,, 4 (centre). YOUNG, immature plumage.

St. Mary's Island, Northd., Oct. 2nd, 1895.

*Stuffed by J. Jackson. Presented by John Duncan***48. Black-headed Gull. *Larus ridibundus*, Linn.**

No. 1 (hind left). YOUNG, changing from first plumage.

Near Monkseaton, Dec. 20th, 1895.

Stuffed by J. Jackson. Presented by John Jackson.

,, 2 (upper centre). MATURE. Winter plumage.

Newbiggin-by-the-Sea, Northd., Feb., 1881.

Presented by E. O. Reid, Esq.

CASE

- No. 3 (right). MALE, young. First plumage.
 Found dead at Hebburn Reservoir, Aug., 1876.
 „ 4 (lower centre). Downy state.
 A few miles west of Newcastle, May, 1873.
 Presented by Thos. Thompson, Esq.
 „ 5 (front centre). Downy state.
 „ 6 (front left). MATURE. Monkseaton, Jan. 2nd, 1895.
 Stuffed by J. Jackson. Presented by John Duncan.

49. Black-headed Gull.

- No. 1 (flying). MALE, immature.
 Tynemouth, Jan. 18th, 1892.
 Presented by John Duncan.
 „ 2 (centre). Downy state. Three young.
 Hallington Reservoir, June 10th, 1891.
 Presented by E. O. Reid, Esq.
 „ 3 (left). IMMATURE. First plumage changing.
 Whitley, August 31st, 1893.
 Presented by John Duncan.
 „ 4 (right). MALE, mature. April 27th, 1894.
 Stuffed by J. Jackson. Presented by John Duncan.

Genus. STERNA.

50. Caspian Tern. *Sterna Caspia*, Pallas.

- No. 1 (left). MATURE. Summer plumage.

Gull-billed Tern. *Sterna Anglica*, Montague.

- No. 1 (right). Young, changing from downy state.

51. Sandwich Tern. *Sterna Cantiaa*, Gmelin.

- No. 1 (hind left). MATURE. Summer plumage.
 „ 2 (upper). Young. First plumage.
 Carnoustie, Forfar.
 Presented by J. G. Millais, Esq.
 „ 3 (right). MATURE. Changing into winter plumage.
 Northumberland Coast, Aug. 8th, 1882.
 Presented by E. O. Reid, Esq.
 „ 4 (front left). YOUNG. Downy state.

CAPT.

52. Common Tern. *Sterna hirundo*, Linn.No. 1 (left). **MATURE.** Summer plumage. 1835.

Presented by Dr. Heysham, 1836.

,, 2 (flying). **MALE**, mature. Summer plumage.

Northumberland Coast, Augt. 8th, 1882.

Presented by E. O. Reid, Esq.

,, 3 (right). **MALE**, mature.

Northumberland Coast, Augt. 8th, 1882.

Presented by E. O. Reid, Esq.

53. Arctic Tern. *Sterna arctica*, Temm.No. 1 (front left). **YOUNG.** First plumage.

Presented by John Hancock to Old Museum.

,, 2 (hind left). **MATURE.** Summer plumage.

From Old Museum Collection.

,, 3 (right). **MATURE** Summer plumage.

From Old Museum Collection.

,, 4 (right). Downy state.

Taken at Barrel of Butter, Augt. 18th, 1865.

E. W. Bidwell, Esq., 1883.

,, 5 (lower centre). **YOUNG.**

Changing from down to feathers.

Presented by E. W. Bidwell, Esq., 1883.

,, 6 (flying). **MALE.** St. Mary's Island, Oct. 2nd, 1895.*Stuffed by J. Jackson. Presented by John Duncan.***54. Roseate Tern. *Sterna Dougalli*, Montague.**No. 1 (left). **YOUNG**, in first plumage.,, 2 (hind centre). **MALE**, mature.

Both of these, Nos. 1 and 2, shot when flying together,

Aug. 6th, 1846, by C. M. Adamson, Esq., on

the Northumberland Coast.

Stuffed and presented by that Gentleman in 1885.,, 3 (front centre). **FEMALE.**

Near Holyhead, N. Wales, July, 1894.

CASE.

No. 4 (right). MALE.

Near Holyhead, N. Wales, July, 1894.

,, 5 (flying). FEMALE.

Near Holyhead, N. Wales, July, 1894.

Nos. 3, 4, 5 presented by Mr. James Oliver.

*Stuffed by J. Jackson.***55. Lesser Tern. *Sterna minuta*, Linn.**

No. 1 (left). MALE, mature. Summer.

Whitley Sands, 1835. John Hancock.

,, 2 (flying). MATURE. Summer. Northumberland Coast.

From Old Museum Collection.

,, 3 (right). YOUNG. First plumage.

Northumberland Coast. From Old Museum.

,, 4 (lower centre). MATURE.

Holy Island, 1832. John Hancock.

,, 5 (front). Downy state. Sweden, 1878.

*Genus. HYDROCHELIDON.***56. Black Tern. *Hydrochelidon nigra*, (Brisson).**

No. 1 (hind left). YOUNG, in first plumage.

Stockton, 1837.

,, 2 (hind right), MATURE. Northumberland Coast, 1830.

,, 3 (centre). Downy state.

Presented by Edw. Bidwell, 1883.

,, 4 (front left). FEMALE? First plumage.

Holy Island, October 4th, 1892.

Stuffed by John Jackson. Presented by J. Robinson, Esq.

No. 5 (flying). MALE? First plumage.

Holy Island, Oct. 4th, 1892.

*Presented by John Robinson, Esq., North Shields.**Stuffed by John Jackson.*

,, 6 (front right). First plumage. Redcar, Sept., 1892.

Purchased, Oct., 1892.

CASE

57. White-winged Black Tern. *Hydrochelidon leucoptera*, (Schinz).

No. 1 (front). Downy state. South Russia, 1881.

Presented by Fred. Raine, Esq., 1885.

„ 2 (centre). MATURE. Shot on the Marsh at Clarence,
mouth of the Tees, May 15th.

Bought at Mr. Oxley's Sale, Redcar, April, 1871.

Genus. *CYGNUS*.

58. Hooper. *Cygnus ferus*, J. Ray.

= *musicus*, Bechstein.

No. 1. YOUNG, in first plumage.

Shot in Northumberland, 1837.

59. Hooper or Wild Swan.

No. 1. FEMALE? Mature.

Shot near Carlisle, winter of 1838.

Presented by Wm. Green, Esq.

60. Hooper or Wild Swan.

No. 1. MALE, mature. Shot near Carlisle, winter of 1838.

Presented by Wm. Green, Esq., 1838.

61. Bewick's Swan. *Cygnus Bewickii*,

Wingate, Selby.

= *olor* β *minor*, Pallas.

No. 1. FEMALE, mature. From Old Museum Collection.

Remark.—The distinctness of this Swan from the common Hooper or Wild Swan was first determined by Mr. R. R. Wingate, and pointed out by him to the Members of the Natural History Society, Oct. 20th, 1829. Afterwards, Feb. 16th, 1830, Mr. Wingate's discovery was more fully elucidated in a paper read to the same Society, Feb. 16th, 1830, by P. G. Selby, Esq., and the name *Cygnus Bewickii* of Wingate, given to it. (See Transactions of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne, vol. I., pp. 1 and 17–25, 1831). If, therefore, Pallas' name *minor* be set aside, the above authors have right of priority. See type specimen in Case 63. *Ed.*

CASE

62. Bewick's Swan.

No. 1 (left). MALE, mature.

One of four birds which were killed at Blaydon and another wounded by one shot from a double-barrelled gun by C. Strong, gamekeeper, Feb., 1837.

„ 2 (right). YOUNG, in first plumage. Scotland, 1856.

63. Bewick's Swan.

No. 1 (left). MALE, mature.

Shot out of a flock of about forty at Prestwick Carr, Jan., 1829.

N.B.—This is the first specimen of this species that was noticed in England to be distinct from the Common Wild Swan by John Hancock. J. H.

„ 2 (right). FEMALE, mature.

Shot at Haydon Bridge, Feb. 7th, 1829.

N.B.—This is the specimen from which the species was named Bewick's Swan. J. H.

Stuffed by R. R. Wingate. Old Museum Collection.

Genus. ANSER.

64. Bean Goose. *Anser segetum*, Gmelin.
sylvestris, Brisson.

No. 1. IMMATURE. Northumberland Coast.

From Old Museum Collection.

65. Bean Goose.

No. 1. YOUNG, immature.

Shot at Jarrow Slake, near South Shields.

Mr. Clark, 1837.

66. Pink-footed Goose. *Anser brachyhynchus*,
Baillon.

No. 1 (left). YOUNG? From Old Museum Collection.

Altered by John Hancock.

„ 2 (right). From Old Museum Collection.

CASE.

67. White-fronted Goose. *Anser albifrons*, Scop.

No. 1 (left). MATURE?

,, 2 (right). MALE, mature. Prestwick Carr, Jan., 1845.

Presented by N. Lambert, Esq.

68. Grey-lag Goose. *Anser cinereus*, Meyer.

No. 1 (left). MALE, mature.

Leadenhall Market, London, March, 1845.

,, 2 (right). MATURE.

Shot at Bewick Hill, near Prestwick Carr, Mar., 1845.

Presented by N. Lambert, Esq.

69. Grey-lag Goose.

No. 1 (left). YOUNG? Prestwick Carr, April 28th, 1855.

*Stuffed and afterwards presented by**C. M. Adamson, Esq., 1884.*

,, 2 (right). FEMALE. Leadenhall Market, London,

March 18th, 1842.

Presented by C. M. Adamson, Esq.

*Genus. BERNICLA.***70. Bernicle Goose. *Bernicla leucopsis*, (Bechst).**

No. 1 (upper left). Shot on Northumberland Coast, 1838.

,, 2 (right). Shot in Islay, Hebrides, April, 1879.

John Hancock.

,, 3 (lower left). Bred in Jesmond Dene, Newcastle-

on-Tyne, 1885.

Presented by Capt. A. Noble, C.B., Jan., 1891.

71. Brent Goose. *Bernicla brenta*, (Brisson).

No. 1 (right). Beadnell, Northumberland, Jan. 2nd, 1895.

Stuffed by J. Jackson. Presented by John Duncan.

,, 2 (left). MALE. Dark variety.

Fenham Flats, Feb. 1st, 1881.

Presented by E. O. Reid, Esq.

,, 3 (centre). MALE, mature.

St. Mary's Island, Northumberland, Jan. 1st, 1894.

Stuffed by J. Jackson. Presented by John Duncan.

CAST.

- 72. Red-breasted Goose. *Bernicla ruficollis*,**
(Pallas.).

From the Wycliffe and Allan Museums.

Remark.—This the first recorded British specimen was shot near London, 1776. Figured by Bewick.

Genus. TADORNA.

- 73. Sheldrake. *Tadorna Belonii*, Ray.**
= *cornuta*, Gmelin.

No. 1 (left). FEMALE, mature. Northumberland, 1833.

„ 2 (right). MALE, mature. Scotland, Feb., 1834.

Presented by Mr. R. Dobson.

- 74. Sheldrake.**

No. 1 (left). MALE, immature. Dumfries, Dec., 1891.

„ 2 (right). FEMALE, immature. Dumfries, Dec., 1891.

Both stuffed by J. Jackson. Purchased of John Duncan.

- 75. Sheldrake.**

No. 1 (front right). Downy state.

„ 2 (hind right). First plumage. 1850.

„ 3 (left). FEMALE, immature.

St. Mary's Island, Sept. 20th, 1894.

Stuffed by J. Jackson. Presented by John Duncan.

- 76. Ruddy Sheldrake. *Tadorna casarca*, (Linn.).**

No. 1 (left). FEMALE, mature.

Kept at Jesmond by Capt. A. Noble, C.B.

Died March, 1882.

„ 2 (right). Downy state.

Bred in confinement in England.

Genus. ANAS.

- 77. Shoveller. *Anas (Spatula) clypeata*, Briss.**

No. 1 (upper right). MALE, mature.

From Old Museum Collection.

CASE

No. 2 (upper right). FEMALE, mature.

From Old Museum Collection.

„ 3 (lower left). MALE. Bought of Pape, Jan. 6 ? 1836.

„ 4 and 5 (lower right). Downy state.

Hatched from eggs taken by Chas. St. John, Esq.,
at Spynie Loch, Morayshire, March, 1850.

78. Shoveller.

No. 1 (right). MALE. First plumage.

Haydon Bridge, July, 1896.

Presented by Geo. E. Crawhall, Esq.

Stuffed by J. Jackson.

„ 2 (left). FEMALE. First plumage.

Near Haydon Bridge, July, 1896.

Presented by Geo. E. Crawhall, Esq.

Stuffed by J. Jackson.

79. Wild Duck. *Anas boschas*, Linn.

No. 1 (left). MALE.

„ 2 (right). FEMALE. J. H.

80. Wild Duck.

No. 1. MALE. Summer plumage. After the breeding season.

Near Haydon Bridge, Aug., 1896.

Presented by Geo. E. Crawhall, Esq.

Stuffed by J. Jackson.

81. Gadwall. *Anas (Chaulelasmus) strepera*,

Brisson.

No. 1 (left). MALE. Changing plumage. Bought 1833.

„ 2 (upper left). MALE, mature. Holland about 1832.

„ 3 (right). FEMALE.

Bought in Leadenhall Market, London, April, 1841.

Presented by C. M. Adamson, Esq., 1885.

„ 4 (front). Downy state, 1864.

Presented by Edw. Bidwell, Esq.

CAPB.

82. Wigeon. *Anas (Mareca) Penelope*, Linn.

No. 1 (left). MALE, mature. From Old Museum Collection.

,, 2 (upper). FEMALE, mature.

From Old Museum Collection.

,, 3 (right). MALE. Changing plumage.

(Summer plumage?) Holy Island, 1856.

Stuffed; and presented by C. M. Adamson, Esq., 1884.

,, 4 (front). Downy state.

83. Wigeon.

No. 1 (right). MALE, mature.

Shot at Darden Lough near Elsdon, Feb. 1st, 1893.

*Presented by George E. Crawhall, Esq.**Stuffed by J. Jackson.*

,, 2 (centre). MALE, immature.

Near Seaton Sluice, Northd. Coast, Oct. 12th, 1895.

Stuffed by J. Jackson. Presented by Mr. John Duncan.

,, 3 (left). MALE, immature.

Near Haydon Bridge, Sept. 6th, 1898.

*Stuffed by J. Jackson. Presented by G. E. Crawhall, Esq.***84. Pintail. *Anas (Dafila) acuta*, Linn.**

No. 1 (right). MALE, mature. Breeding plumage. 1833.

,, 2 (left). FEMALE. Leadenhall Market, London.

Presented by C. M. Adamson, Esq.

,, 3 (front left). Downy state. Petchora, Russia.

Presented by Henry Seebohm, Esq., 1875.

85. Pintail.

No. 1 (lower left). FEMALE? immature.

Bought of Mrs. Russell, fruiterer, Newcastle.

,, 2 (upper left). MALE. Changing plumage.

Shot near Holy Island, 1834.

,, 3 (right). YOUNG. Changing from downy state

to first feathers.

Bred in confinement at Jesmond, June, 1883.

Presented by Capt. A. Noble, C.B., F.R.S.

CASE.

86. Pintail.

No. 1 (left). MALE. Summer dress, after breeding season.

Near Haydon Bridge, July, 1896.

Presented by George E. Crawhall, Esq.

,, 2 (right). FEMALE, mature.

Shot near Haydon Bridge, Aug. 2nd, 1897.

*Presented by George E. Crawhall, Esq.**Both these stuffed by John Jackson.*87. Teal. *Anas (Querquedula) crecca*, Linn.

No. 1 (hind left). MALE, young.

St. Mary's Island, Northd., Oct. 16th, 1834.

,, 2 (front left). FEMALE, young.

Seaton Sluice, April 13th, 1895.

Stuffed by J. Jackson. Presented by John Duncan.

,, 3 (hind right). MALE, mature. Belsay.

*Presented by Sir Arthur Middleton, Bart., 1887.**Stuffed by Duncan.*

,, 4 (left centre). Downy state.

Prestwick Carr, June, 1840.

,, 5 and 6 (centre). Downy state.

Horton Grange, Dinnington, May 6th, 1882.

,, 7 (right). Downy state. Caithness, 1876.

Stuffed and presented by Fred. Raine, Esq.

,, 8 (flying). MALE, mature.

Urpeth, Co. Durham, Jan., 1889.

*Presented by James Joicey, Esq.*88. Gargany. *Anas (Querquedula) circia*, Linn.

No. 1 (left). MALE, mature. From Old Museum Collection.

,, 2 (upper). FEMALE, mature.

From Old Museum Collection.

,, 3 (right). Downy state.

From the Volga district, Russia, July 3rd, 1878.

CASE.

89. Hybrid between Wild Duck and Pintail.

No. 1 (left). Shot near Newcastle, Feb., 1835.

*Bequeathed by Sir Walter C. Trevelyan, Bart., 1883.***Hybrid between Wild Duck and Wigeon.**

No. 2 (right).

From Old Museum Collection.

90. Empty Case.**91. Empty Case.****92. Empty Case.***Genus. FULIGULA.***93. Pochard. Fuligula ferina, (Linn.).**

No. 1 (left). FEMALE, mature.

Gosforth Lake, Jan. 28th, 1885.

Presented by R. S. Garwood, Esq.

,, 2 (upper). MALE, mature. Prestwick Carr, Feb., 1836.

,, 3 (right). MATURE. Variety.

Holy Island Lough, Aug. 13th, 1844.

*Stuffed and presented by C. M. Adamson, Esq., 1884.***94. Pochard.**

No. 1 (centre). MALE, mature.

Near Haydon Bridge, Dec. 14th, 1897.

,, 2 (left). FEMALE, mature.

Near Haydon Bridge, Dec. 14th, 1898.

,, 3 (right). FEMALE, mature.

Near Haydon Bridge, Dec. 14th, 1898.

*All three presented by Geo. E. Crawhall, Esq.,**Stuffed by J. Jackson.**April, 1899.***95. White-eyed Pochard. Fuligula nyroca,**

Güldenstein.

No. 1. MALE, mature. Received about 1834.

CASE

96. Red-crested Duck. *Fuligula rufina*, (Pall.).

No. 1 (left). MALE, mature.

Leadenhall Market, London, Feb., 1849.

,, 2 (right). FEMALE, mature.

Leadenhall Market, London, 1849.

Received from Mr. Green, London.

97. Scaup Duck. *Fuligula marila*, (Linn.)

No. 1 (left). FEMALE, mature.

Holy Island, Northd. Coast, Jan., 1891.

Presented by John Duncan.

,, 2 (right). MALE, nearly mature.

Near Haydon Bridge, Jan., 1896.

*Presented by George E. Crawhall, Esq.**Both stuffed by J. Jackson.***98. Scaup Duck.**

No. 1 (left). MALE, mature. Cullercoats, winter, 1838.

,, 2 (upper centre). FEMALE, mature. Northd., 1837.

,, 3 (right). MALE? Young.

From Old Museum Collection.

,, 4 (hind centre). Downy state.

Lulea, Lappmark, July 1st, 1876.

Presented by Edw. Bidwell, Esq., 1883.

,, 5 (front centre). Downy state. July, 1881.

*Presented by Fred. Raine, Esq., 1885.***99. Tufted Duck. *Fuligula cristata*, Leach.**

No. 1 (hind left). FEMALE. Netherwitton.

Presented by Wm. Adamson, Esq.

,, 2 (upper centre). MALE, mature. Winter, 1838.

,, 3 (right). MALE, mature. Northumberland, 1834.

,, 4 (front centre). Downy state. July 29th, 1879.

Presented by Fred. Raine, Esq., 1885.

,, 5 (left). MALE, mature.

Shot near Haydon Bridge, Sept., 1897.

*Presented by George E. Crawhall, Esq.**Stuffed by J. Jackson.*

CASE

100. Tufted Duck.

No. 1 (upper right). MALE, mature. Capheaton, 1859.

*Presented by Sir Arthur Middleton, Bart., 1887.**Stuffed by Duncan.*

,, 2 (hind left). FEMALE. Rothley Lake, Aug., 1890.

Presented by John Daglish, Esq.

,, 3 (right).- MALE, mature. Rothley Lake, Sept., 1890.

Presented by John Daglish, Esq.

,, 4 (front left). FEMALE. Changing to male plumage.

Remark.—This bird lived in the Leazes Park 14 years.
Drowned under the ice Jan., 1891. Ed.*Presented by the Corporation of Newcastle-upon-Tyne,*
*Jan., 1891, per Mr. Wilson.**Nos. 2, 3, 4 stuffed by J. Jackson.**Genus. CLANGULA.***101. Golden Eye. Clangula glaucion, (Linn.).**

No. 1 (centre). MALE, mature. Capheaton, 1859.

*Presented by Sir Arthur Middleton, Bart.,**Stuffed by Duncan.**Belsay Castle, 1887.*

,, 2 (right). FEMALE, mature.

*Wear, near Leamside, Jan. 1st, 1891.**Presented by Alfred C. Chapman, Esq.**Stuffed by J. Jackson.*

,, 3 (left). MALE, immature.

*Rothley Lake, Nov. 4th, 1890.**Stuffed by J. Jackson. Presented by John Daglish, Esq.***102. Golden Eye.**

No. 1 (left). MALE, mature.

Benwell Boat House, Dec., 1834.

,, 2 (centre). Downy state. Russia, May 7th, 1878.

,, 3 (right). FEMALE, mature.

*Near Elsdon, Northumberland, Feb., 1891.**Presented by Geo. E. Crawhall, Esq.**Stuffed by J. Jackson.*

CASE

103. Golden Eye.

No. 1 (right). MALE, mature. Near Haydon Bridge.

Presented by Geo. F. Crawhall, Esq.

,, 2 (left). FEMALE, nearly mature.

Haydon Bridge, Dec., 1896.

*Presented by Geo. F. Crawhall, Esq.**Both stuffed by J. Jackson.***104. Harlequin Duck. *Clangula histrionica*,
(Linn.).**

No. 1 (left). MALE, mature. Davis Straits, 1837.

Presented by Capt. Warham.

,, 2 (centre). FEMALE, mature. Iceland.

,, 3 (right). MALE, mature. Davis Straits, 1837.

*Presented by Capt. Warham.**Genus. HARELDA.***105. Long-tailed Duck. *Harelda glacialis*, (Linn.).**

No. 1 (left). FEMALE. Winter plumage.

Northumberland Coast, 1842.

,, 2 (right). MALE. Complete winter plumage.

North Sunderland, Feb., 1843.

,, 3 (centre). MALE, immature, changing to summer.

Off Seaton Sluice, Jan. 15th, 1894.

*Stuffed by J. Jackson. Presented by John Duncan.***106. Long-tailed Duck.**

No. 1 (left). MALE. Changing plumage.

,, 2 (centre). FEMALE. Nearly complete summer.

,, 3 (right). MALE. Nearly complete summer.

,, 4 (front centre). Downy state.

Petchora, Russia, June 9th, 1875.

,, 5 (right). Downy state.

Petchora, Russia, July 8th, 1883.

Nos. 4 and 5 presented by Edw. Bidwell, Esq.

CASE

107. Long-tailed Duck.

No. 1. MALE, immature. Fenham Flats, Nov., 1895.

Stuffed by J. Jackson. Presented by John Duncan.

Genus. SOMATERIA.

**108. Steller's Western Duck *Somateria Stelleri*,
(Pallas).**

No. 1 (left). MALE.

„ 2 (right). FEMALE. From Old Museum Collection.

109. Eider Duck. *Somateria mollissima*, (Linn.).

No. 1. MALE, mature. Northumberland Coast about 1826.

J. Hancock.

110. Eider Duck.

FEMALE, mature.

Presented by P. J. Selby, Esq.

Stuffed by R. R. Wingate. From Old Museum Collection.

111. Eider Duck.

No. 1 (left). MALE, young. Changing from first plumage.

St. Mary's Island, Northd. Coast, Jan. 15th, 1894.

Stuffed by J. Jackson. Presented by John Duncan.

„ 2 (right). MALE.

Summer plumage after breeding season.

From Old Museum Collection.

„ 3 (centre). Downy state. Farne Islands.

Presented by Rd. Howse.

„ 4 (right). Downy state.

E. G. Wheeler, Esq., Alnwick.

112. King Eider. *Somateria spectabilis*, (Linn.).

No. 1 (left). MALE, mature. Davis Straits, 1834.

Presented by Capt. Warham.

„ 2 (upper). FEMALE. North Greenland, 1850.

CASE.

*Genus. OIDEMIA.***113. Scoter. *Oidemia nigra*, (Brisson).**

No. 1 (left). MALE. Changing plumage,
Northumberland Coast, 1833. J. H.

„ 2 (upper centre). FEMALE. Holy Island, 1834. J. H.

„ 3 (right). MALE. Northd. Coast, 1831. J. H.

„ 4 (lower centre). FEMALE. Fenham Flats, Nov., 1895.

Stuffed by J. Jackson. Presented by John Duncan.

114. Velvet Scoter. *Oidemia fusca*, (Linn.).

No. 1 (left). FEMALE, mature.

„ 2 (right). MALE, mature.

Nos. 1 and 2 bought of Pape, March, 1844.

115. Velvet Scoter.

No. 1 (left). MALE.

Shot near North Sunderland, July, 1846.

„ 2 (right). MALE, young. Northumberland, 1834.

116. Surf Scoter. *Oidemia perspicillata*, (Linn.).

No. 1. MALE, mature. Stickeen River, British Columbia.

Presented by Mr. F. H. Donnison.

From Old Museum Collection.

*Genus. MERGUS.***117. Goosander. *Mergus merganser*, Linn. ex Briss.**

No. 1 (lower). MALE, mature.

Beal, Northumberland, Aug., 1838.

„ 2 (upper). FEMALE, mature. Northumberland, 1834.

118. Goosander.

No. 1 (left). MALE, young. Immature plumage.

Northumberland, 1830.

„ 2 (right). FEMALE. Immature?

Northumberland, Nov., 1890.

Presented by Messrs. Phillips & Co., Newcastle.

Stuffed by J. Jackson.

CASE.

119. Red-breasted Merganser. *Mergus serrator*, Linn.

No. 1 (centre). MALE, mature. North Sunderland, 1838.

„ 2 (upper centre). FEMALE, mature.

Northumberland, April 1st, 1832.

Purchased in Newcastle.

„ 3 (lower left). Downy state. Norway, 1840.

Presented by C. A. Pehl, Esq.

„ 4 (lower right). YOUNG. First feathers.

Shot by E. J. J. Browell out of a brood of nine on West Loch Tarbert, Aug. 20th, 1877.

120. Smew. *Mergus albellus*, Linn.

No. 1 (upper left). MALE, mature.

Shot at Gilsland, Feb., 1838.

„ 2 (upper right). MALE, mature.

Bishop Auckland, Jan., 1838.

„ 3 (lower left). FEMALE, young.

Denham Court, Jan., 1864.

Presented by N. G. Lambert, Esq.

„ 4 (lower right). MALE, mature.

Shot in Yorkshire, Jan., 1876.

Stuffed by Duncan. Presented by George E. Crawhall, Esq.

Genus. URIA.

121. Guillemot. *Uria Troile*, (Linn.).

No. 1 (left). Summer plumage.

From Old Museum Collection.

„ 2 (centre). Summer plumage. Var. *ringvia*.

Tynemouth, 1838.

„ 3 (right). Summer plumage. Var. *ringvia*.

Skye. E. P. Johnson, Esq., Aug., 1891.

„ 4 (front centre). Down and first feathers.

Farne Islands, 1876.

Presented by Fred. Raine, Esq.

„ 5 (front right). Down and first feathers.

From Old Museum Collection.

CASE

122. Guillemot.

No. 1 (left). Winter plumage.

,, 2 (right). Winter plumage.

Off Tynemouth, Feb., 1891.

,, 3 (centre). Winter plumage. Var. **ringvia**.*Purchased.**All three stuffed by J. Jackson.***123. Guillemot.**

No. 1 (right). Winter plumage.

From Old Museum Collection.

,, 2 (centre). Winter plumage. Var. **ringvia**.

Northumberland Coast, 1838. J. Hancock.

,, 3 (left). MALE. Nearly mature. Summer plumage.

St. Mary's Island, March 8th, 1894.

*Stuffed by J. Jackson. Presented by John Duncan.***124. Brünnich's Guillemot. *Uria Brünnichi*,**

Sabine.

No. 1 (left). Summer plumage. Davis Straits.

Stuffed by J. Jackson. Skin from Hancock Collection.

,, 2 (lower centre). Summer plumage nearly complete.

Davis Straits.

Presented by Capt. Warham, 1835. J. Hancock.

,, 3 (centre). Winter plumage changing.

,, 4 (right). Winter plumage changing. Iceland.

Bought of W. Proctor, 1864. J. H.

*Nos. 3 and 4 stuffed by John Jackson, 1891.***125. Black Guillemot. *Uria grylle*, (Linn.).**

No. 1 (left). Winter plumage.

From Old Museum Collection.

,, 2 (upper left). Young plumage.

From Old Museum Collection.

,, 3 (centre). Winter plumage.

Northumberland Coast, 1837.

,, 4 (right). Summer plumage.

CASE

*Genus. MERGULUS.***126. Little Auk. *Mergulus alle*, (Linn.).**

No. 1 (lower left centre). Summer plumage.

Presented by Rev. J. F. Bigge. J.H.

,, 2 (upper left centre). Winter plumage.

Northumberland Coast, 1840. J.H.

,, 3 (hind right centre). Winter plumage.

Cullercoats, Nov. 14th, 1833. J.H.

,, 4 (front right centre). Summer plumage.

Davis' Straits, 1843. J.H.

,, 5 (front left). Winter plumage. Neck shewing dark feathers on throat.

St. Mary's Island, Nov. 20th, 1893. *Purchased.*

,, 6 (hind left). Winter plumage.

St. Mary's Island, Nov., 1893.

Presented by John Duncan.,, 7 (right). Winter plumage. Found in a field at Darlington. *Purchased.**Nos. 5, 6, 7 Stuffed by John Jackson.**Genus. FRATERCULA.***127. Puffin. *Fratercula arctica*, (Linn.).**

No. 1 and 2 (centre). MALE and FEMALE. Taken at the Farne Islands, summer of 1832, when W. C. Hewitson, Albany and John Hancock first visited these islands.

,, 3 (upper left). YOUNG. First plumage.

Presented by Thomas Thompson, Esq.

From Old Museum Collection.

,, 4, 5, 6 (front). Downy state.

Presented by Edw. Bidwell, Esq. and R. W. Chase, Esq., 1882.

*Genus. ALCA.***128. Razor Bill. *Alca torda*, Linn.**

No. 1 (front). YOUNG. Winter plumage. Feb. 16th, 1872.

,, 2 (left). First plumage. Head black. Bass Rock.

Presented by Richard Howse, July, 1880.

CASE

No. 3 (upper left). Changing from summer to winter.

From Old Museum Collection.

„ 4 (upper centre). Summer plumage. Northumberland Coast. From Old Museum Collection.

„ 5 (upper right). Winter plumage. Northumberland Coast. From Old Museum Collection.

„ 6 (lower right). YOUNG. First plumage. Head black.

Shot by J. Hancock, at St. Mary's Island, Aug., 1835.

Remark.—Mr. R. E. Bewick went into the sea and brought the bird out. J. H.

[129. In large adjoining Case.]

129. Great Auk. *Alca impennis*, Linn.

No. 1. IMMATURE. Assuming winter plumage?

From the Wycliffe-Allan Museum, 1822.

From Old Museum Collection, 1884.

Remarks.—Young bird in a changing state of plumage. In 1863 it was re-stuffed by John Hancock, when the bones of the head, wings, and feet, which are shewn on the right hand in this case, were removed. J.H.

This Wycliffe example of the Great Auk seems to be a young bird of the year acquiring the winter plumage, and it is at present the only one known in that dress. It is most probable that the very young bird had the first feathers of the head black as in the summer plumage of the adult, and as in the young of the Razorbill. Mr. Symington Grieve has, I think, given a figure of a young Great Auk in that state of plumage, that is with the head entirely black. Ed. See Note on Great Auk, p. 410.

No. 2 (left). Upper Mandible of Great Auk.

Remark.—This bone was picked out of a collection of bones of Mammals, Birds, and Human remains which were found in a cave at Marsden, in the month of April, 1878. This is probably the most Southern locality in Europe where the remains of this extinct bird have been found. The Society is indebted to John Daglish, Esq., Marsden, for the collection of bones from the Caves at Marsden, coast of Durham near South Shields. J.H.

CASE

*Genus. PODICEPS.***130. Great Crested Grebe. *Podiceps cristatus*,**
(Brisson).

No. 1. MALE. MATURE.

Shot at Cape Thorn, Reedsmere Lake, Macclesfield,
March 25th, 1835.**131. Great Crested Grebe.**

No. 1 (lower left). Winter plumage.

From Old Museum Collection.

,, 2 (upper left). FEMALE. Young. Changing state.

Shot on the Tyne near the King's Meadows, Nov., 1840.

,, 3 (right). Two young in the downy state.

132. Red-necked Grebe. *Podiceps griseigena*,
(Boddert).No. 1 (lower left). IMMATURE bird of the year, shewing
part of the first plumage.

Shot on the Northumberland Coast, Dec., 1844.

,, 2 (upper left). First plumage. Leadenhall Market,
London, Dec. 5th, 1882.,, 3 (right). Winter plumage, shewing summer feathers
on the neck. Northumberland Coast, 1830.**133. Red-necked Grebe.**

No. 1 (left). Summer plumage.

From Old Museum Collection.

,, 2 (right). Winter plumage. Northumberland Coast,
1833.**134. Red-necked Grebe.**

No. 1 (centre). FEMALE. Winter. Bamburgh, Jan. 1891.

Presented by Rd. Howse.

,, 2 (left). FEMALE. Winter. St. Mary's Island, Jan., 1891.

Presented by Mr. W. English, Heaton.

,, 3 (right). IMMATURE. Winter.

Fenham Flats, April 9th, 1895.

All stuffed by J. Jackson. Presented by Thomas Thompson, Esq.

CASE

135. Slavonian Grebe. *Podiceps auritus*, (Linn.).

No. 1 (front left). Winter plumage. Northumberland
Coast, 1836.

„ 2 (upper left). Winter plumage. Bought in a shop
in Newcastle, March, 1872.

„ 3 (right). Summer plumage. Cullercoats, April 26th,
1830.

„ 4 (front centre). Downy state. Denmark.

Remarks.—In all probability this skin would be brought
from Iceland. J. Hancock.

No. 5 (hind centre). MALE, mature. Winter dress.
St. Mary's Island, March 8th, 1894.

Stuffed by J. Jackson. Presented by John Duncan.

**136. Eared Grebe. *Podiceps nigricollis*, Brehm.
auritus, (Brisson).**

No. 1 (right). MALE. Summer plumage.
From Old Museum Collection.

„ 2 (lower centre). MALE. Summer plumage.
Bought of Mr. James Pape, 1847.

„ 3 (hind left). Winter plumage. Northumberland,
1840.

„ 4 (front left). Downy state. From the Volga.
Edward Bidwell, Esq., Sept. 9th, 1882.

Is this the young of the Eared Grebe or the Slavonian?

J. Hancock.

No. 5 (flying). FEMALE. Winter. Holy Island, Jan. 1891.

Stuffed by J. Jackson. Presented by W. E. Beck, Esq.

137. Little Grebe. *Podiceps fluviatilis*, (Brisson).

No. 1 (left). Winter plumage. Northumberland, Oct., 1840.

„ 2 (centre). Winter plumage. Northumberland, 1840.

„ 3 (upper right). MALE. Summer dress. Shot at
Howick, Northumberland.

Presented by Mr. Moffitt.

„ 4 (right). Downy state.

CASE

*Genus. COLYMBUS.***138. Red-throated Diver. *Colymbus septentrionalis*, (Linn.).**

No. 1. Nearly in summer plumage.

St. Mary's Island, 1836.

139. Red-throated Diver.

No. 1. IMMATURE. First plumage.

Whitley, Northumberland Coast. 1895.

*Stuffed by J. Jackson.**Presented by John Jackson.***140. Red-throated Diver.**

No. 1. Winter plumage. Northumberland Coast, 1836.

Presented by W. C. Hewitson, Esq.

**141. Black-throated Diver. *Colymbus arcticus*,
Linn.**

No. 1 (left). Winter plumage.

From Old Museum Collection.

,, 2 (right). First plumage.

Northumberland Coast about 1840.

142. Black-throated Diver.

No. 1 (upper). Summer plumage.

Sutherlandshire, Aug. 22nd, 1859.

Presented by W. E. Barnett, Esq.

,, 2 (lower). Summer plumage nearly complete.

Shot on the River Wear, Co. Durham,

Dec. 16th, 1845.

Remark.—I had this bird in the flesh state shortly after it was shot. J. Hancock.**143. Great Northern Diver. *Colymbus glacialis*,
Linn.**

No. 1 (upper). Summer plumage.

Shot at the Orkneys, 1839.

Presented by Capt. Warham.

,, 2 (lower). First plumage.

Bought of Hannah Russell, fruiterer,

Newcastle-upon-Tyne, 1835.

CASE

144. Great Northern Diver.

No. 1. FEMALE. Summer plumage.

Shot at Holy Island.

Presented by Thomas Sopwith, Esq.

145. Great Northern Diver.

No. 1. Winter plumage.

Shot on a bog near Embleton, Northumberland,

Dec., 1829.

Presented by Mr. G. Davidson, of Embleton.

Remark.—This variety is called by some authors *Urinator Adamsii* (Gray). Proc. Zool. Soc., p. 167, 1859. Stein., U.S. National Mus., vol. v., p. 43, 1882. J. H.

GROUPS OF BIRDS

ON PEDESTALS AND CABINETS.

No. 1. Eagle attacking Swans.**White-tailed Eagle. *Haliaetus albicilla*,**
(Linn.)**Bewick's Swan. *Cygnus minor*, (Pallas).**

Remark.—All the bones of the head, body and feet have been removed from the two front birds. This group was done in 1862. J. H., fecit.

„ 2. Greenland Falcon attacking Raven.
J. H. 1854.**3. The Læmmergeyer of the Alps. *Gypaetus barbatus* (Linn.).**

Remark.—This case was exhibited with others at the Crystal Palace Exhibition in Hyde Park, London, 1851. J. H.

- No. 4. Head of Mallard or Wild Drake.
J. H., fecit. **Anas boschas.**
- „ 5. Iceland Falcon. **Falco gyrfalco.** (Linn.).
Var. **Islandus.** (Brisson).
FEMALE in mature plumage. J. H., fecit.
- „ 6. Iceland Falcon.
MALE in first plumage. Davis Straits.
Capt. Warham, 1835.
Remarks.—This specimen is probably a cross between
the Iceland and Greenland varieties. See the white,
third primary wing-feather. J. Hancock.
- „ 7. Iceland Falcon.
MALE in mature plumage. South Greenland, 1850.
- „ 8. Kestrel.
Six young in downy state, taken from the nest near
Alnwick, June, 1885. Presented by Nath. Dunn, Esq.

FALCONRY ILLUSTRATED.

IN THREE GROUPS.

- „ 9. 1. The Hooded Falcon.
- „ 10. 2. The Struggle with the Quarry.
- „ 11. 3. The Gorged Falcon.
Remarks.—These groups were exhibited at the Great
Exhibition in the Crystal Palace, Hyde Park, London,
in 1851. J. H., fecit.
- „ 12. The Falcon's Fate in the 19th Century.
- „ 13. Bar-tailed Pheasant. **Phasianus Reevesii,**
Gray.
1 (left). MALE. Bred in Scotland.
Presented to J. Hancock by The Right Honourable
the Earl of Ravensworth, 20th June, 1878.

2. FEMALES.

Presented by the Right Honourable Lord Tweedmouth, 7th Jan., 1882.

Remark.—These birds were bred at Guisachan Strathglass, Inverness-shire, where this Pheasant is now quite naturalized. J. Hancock, fecit.

No. 14. Green Woodpeckers. *Gecinus viridis*, (L.).

At their breeding place.

1 (right). MALE, mature.

2 (left). FEMALE, mature.

New Forest, Hampshire

Presented by S. Graham, Esq., 1889.

Remark.—The part of the Birch Tree, in which there had been several nests, was given to me by Capt. Verner, Camberley, 1883. J. Hancock.

,, 15. Greenland Falcon.

MALE, mature (once moulted).

Red Grouse.

Remark.—This group illustrates the manner in which the the Falcon kills its prey, after striking it down. J. Hancock, fecit, 1850.

,, 16. Raven. *Corvus corax*, Linn.

1 (left). MALE. Hesleyside, North Tyne,

Northumberland, Feb., 1837.

2 (right). MALE. Stromness, Nov., 1877.

3 (centre). FEMALE, Moffat Water, April, 1875.

Nos. 2, 3 presented by G. E. Crawhall, Esq., 1884.

,, 17. Dead Game.

Black Grouse and Ptarmigan.

Remark.—This group was exhibited at the Great Exhibition in the Crystal Palace, Hyde Park, London, in 1851. J. H.

No. 18. Rose-coloured Starling. *Pastor roseus*.

MALE (*upper*). Killed at Elswick whilst it was feeding on a dunghill 26th July, 1855.

MALE (*lower*). Was shot on the Black Fell at Gateshead, 15th Sept., 1856.

Preserved and bequeathed by J. Hancock.

Received Jan., 1897.

Remarks.—This group is figured in Mr. Hancock's Catalogue of Birds of Northumberland and Durham.

„ 19. Pallas' Sand Grouse, *Syrrhaptes paradoxus*, (Pallas).

MALE and FEMALE.

1 and 2 were shot out of a flock of 12 or 14 near Thropton, Rothbury, Northumberland, on 21st May, 1863.

3. The Male with its mouth open was shot at Cowpen, Northumberland, about the 29th June, 1863.

4. The Female with the head turned was shot near Berwick-upon-Tweed about the 25th September, 1863.

„ 20. Common Pheasant, *Phasianus Colchicus*, Linn.

Pale or Bohemian variety, shot at Trew hitt, near Rothbury, Northumberland, Jan., 1884.

Presented to J. H. by Sir W. G. Armstrong, C.B., F.R.S.

„ 21. Common Partridge and Brown Variety.

***Perdix cinerea*, Charlton, and**

***Perdix montana*, Brisson.**

1. Common Partridge. **MALE,**

2. „ „ Downy state.

3. Brown variety (*Perdix montana*), shot at Widdrington, Northumberland, about Jan. 16, 1871.

This specimen, with No. 1, was bought in a poulterer's shop in Newcastle.

4. Brown variety (*P. montana*). Young female, was shot out of a covey of ten of the same variety at Widdrington on the 16th October, 1873.

Presented by Mr. H. Wilkinson of Newcastle.

5. Brown variety (*P. montana*). Young in first plumage showing some brown feathers. Shot 19th Sept., 1873.

Bought of Mr. R. Duncan. Newcastle.

[See remarks on p.p. 335-6.]

No. 22. Bullfinches.

MALE and FEMALE.

Killed against a window at Oatlands, Surrey,
16th July, 1888.

„ 23. Group of Cock-of-the-Rock.

1, 2, 3, 4. Demeraran Cock of the Rock.

Rupicola crocea, Vieillot. MALE.

Inhabits North-east of South America.

5, 6. Peruvian Cock-of-the-Rock.

Rupicola Peruviana, (Dumont).

5. MALE. 6. FEMALE.

Inhabits North-west of South America

Remark.—This group was done for W. C. Hewitson, Esq., Oatlands, Surrey, by John Hancock.

Bequeathed by John Hancock, Esq.,
and received 1892

„ 24. Group of Birds of Paradise.

1. *Paradisea Raggiana*, Selater.

2. *Circinnurus regius*, (Linn.).

North Coast, New Guinea.

Presented by Capt. N. R. Sayers, Feb., 1888.

J. H., fecit.

No. 25. Group of Birds of Paradise.

1. Greater Bird of Paradise. MALE.

Paradisea major = *apoda*, Linn.

2. King Bird of Paradise.

Circinnurus regia, (Linn.).

New Guinea.

Remark.—This group was done by J. Hancock for W. C. Hewitson, Esq., of Oatlands, Surrey.

Bequeathed by John Hancock, Esq.

Received 1892.

,, 26. Water Rails. *Rallus aquaticus*.

Northumberland, 1856.

Remark.—This group was done to shew how birds of the same species vary in size. J. Hancock.

,, 27. Skeleton of Mummy Ibis.

Thebes, Upper Egypt.

Remark.—This skeleton was made from a Mummy Ibis brought from a tomb at Thebes, by Sir W. G. Armstrong, C.B., and presented to me April, 1872. The claws are crooked and overgrown, indicating that the bird had been domesticated. Cuvier has expressed a similar opinion. J. Hancock.

,, 28. Skeleton of Spoonbill.

J. H., fecit, 1830. *Platalea leucordia*, Linn.

,, 29. Group of Dead Birds.

Wild Duck. *Anas Boschas*, Linn.Water Hen. *Gallinula chloropus*, (Linn.).
J. H., fecit, 1864.,, 30. Red Crouse. *Lagopus Scoticus*.

MALE. Cream-coloured example.

Shot on the moors near Newbrough, Dec., 1889.
Presented by Geo. Cookson, Esq., 11th Dec, 1889.*Remark.*—This specimen was stuffed by J. Jackson, and put into position by J. Hancock, 1890.

No. 31. Cormorant. *Phalacrocorax carbo*, (Linn.).

FEMALE, mature. Winter.

Stuffed to represent a trained bird taking a fish, by John Hancock, 1884.

Remark.—This bird was trained by Capt. Salvin and was named "Isaac Walton" by the donor, who used it for catching fish for some time. It died in 1850, when it came into my possession. On dissection it was proved to be a female. J. H.

„ 32. Herring Gull. *Larus argentatus*, Brünnich.

YOUNG. Shot by E. O. Reid, 10th Nov., 1886.

J. H., fecit.

Presented by Mr. John Jackson.

„ 33. Group of Ducks.

1 and 2. Tufted Duck. MALE.

Fuligula cristata.

3. Pochard. FEMALE.

Fuligula ferina, (Linn.).

4. Teal. *Querquedula crecca*, (Linn.).

J. H., fecit, 1864.

„ 34. Elder Duck. MALE, in breeding plumage.

Somateria mollissima, Linn.

1. MATURE MALE.

Northumberland Coast, 20th March, 1879.

Presented by E. O. Reid, Esq.

Remark.—In this specimen the bones were entirely removed. J. H.

„ 35. Great Auk. *Alca impennis*, Linn.

Summer plumage.

Received this bird from Mr. Mecklinburg, Flensburg, April, 1844.

This, and another specimen with two eggs, were brought from Iceland a year or two previous to above date.

As far as is known, these were the last captures of this rare bird.

These eggs were stated to have belonged to them: and that modelled under the foot is a *facsimile* of one of the specimens.

In this preparation the bones are entirely removed. J. Hancock. The bones in this case belong to this bird.

No. 36. Fulmar. *Fulmarus glacialis*, (Linn.).

Found dead on Whitburn Sands, coast of Durham, about the year 1860. J. H., fecit.

„ 37. Mandarin Duck.

***Dendronessa galericulata*, (Linn.).**

1. MALE. Presented to John Hancock by
Capt. A. Noble, May 20th, 1881.

2. FEMALE. Presented by Alex. S. Stevenson, Esq.,
J. H., fecit, 1883.

„ 38. Group of Dead Game.

Teal.

Hybrid between Wigeon and Pintail.

Blackcock.

Snipe, etc. J. H., fecit, 1851.

„ 39. Group of Little Gulls.

***Larus minutus*, Pallas.**

One screaming over its shot companion. Both killed at Whitburn, coast of Durham, about the year 1849.

Remark.—This group was exhibited in the Crystal Palace, Hyde Park, London, 1851. J. H., fecit.

„ 40. Group of Little Gulls.

***Larus minutus*, Pallas.**

1. First plumage.

Northumberland Coast, 5th Sept., 1846.

2. Changing from young to winter plumage.

3. MATURE. Winter plumage. Shot on the Northumberland Coast about the year 1846. J. H., fecit.

NEW ZEALAND BIRDS,
ARRANGED IN CASES IN THE GALLERY.

KIWIS.

Kiwi. **Apteryx Australis**, (Shaw). MALE.

From the Black Mountains, New Zealand.

J. H., fecit. Presented by George Burnett, Esq., 1885.

Group of Kiwis.

1. **Apteryx Oweni**, Gould.
2. **Apteryx Australis**, Shaw.

From New Zealand.

Presented by Mr. John Mawson.

Group of Kiwis.

- 1 and 2. **Apteryx Oweni**, Gould.

Presented by E. B. Cargill, Esq., 1877.

3. **Apteryx Oweni**, Gould.

From the South Island.

J. H., fecit. Bought in Glasgow by Rd. Howse.

Skeleton of **Apteryx** (made up from several specimens).

The bones are chiefly from the stuffed specimen of the var. *A. Mantelli* in the adjoining case. The skin and dried body were brought from New Zealand and presented to the Museum by Capt. Collinson in 1851. The feet and right wing to Mr. Mawson's specimen. The tibiæ and fibulæ belonged to a third specimen, and the skull from a bird sent by Mr. George Burnett, 1885. J. H.

PENGUINS.

- 1a. Yellow-crested Penguin. *Eudyptes chrysocomus*, Forst.
From the West Coast of South Island.
Presented by E. B. Cargill, Esq., N.Z., 1877.
- 1b. Skeleton of the above Species.
2. Blue Penguin. *Eudyptula minor*, (Forst).
3. Little Penguin, ,, *undina*? Gould.
Presented by E. B. Cargill, Esq., 1877.

RAIL AND WEKAS.

- Swamp Hen. *Porphyrio melanotus*, Temm.
Maori name, **Pukeko**.
3. MALE. North Island, N.Z.
J. Hancock. Presented by G. H. Swan, Esq., 1884.

Wekas.

1. South Island Woodhen. *Ocydromus Australis*, (Sparrman).
Presented by E. B. Cargill, Esq., N.Z., 1877.
2. *O. Australis*, variety?
Presented by G. H. Swan, Esq., 1884.
3. Black Woodhen. *Ocydromus fuscus*,
Dubus.
Presented by E. B. Cargill, Esq., 1877.

Remark.—The specimens were sent to J. Hancock in spirits. J. H.

Weka. Young in downy state. North Island, N.Z.

Remark.—Obtained near Whangarei, N. Island, by Geo. Burnett, Esq., and sent in spirits to J. Hancock. The dried body of this bird in the Case. J. H.

OWL-PARROTS.

- Owl-Parrot. *Stringops habroptilus*, Gray.
Presented by Capt. B. Collinson, R.N., Aug., 1851.
J. H., fecit. Maori name, **Kakapo**.

Owl-Parrot.

Three and a skeleton in one case. So. Island, N.Z.

Remark —The specimens in this case were sent to England in spirits along with several other birds by E. B. Cargill, Esq., of Dunedin, New Zealand, by whom they were presented to John Hancock, 1877. The numbers on the specimens refer to the Skeleton and the bodies kept in spirits. J. H.

1. Skeleton of Owl-Parrot.

Remark.—This skeleton was taken out of the stuffed specimen No. 1 on the right hand in the same case.

J. H., fecit.

Mountain Parrot. *Nestor notabilis*, Gould.

Maori name, **Kea.**

1. **MALE.** South Island, N.Z.

2. **FEMALE.** „

Presented by E. B. Cargill, Esq., New Zealand,
J. H., fecit. 1881.

HUIA.**Huia. *Heteralocha acutirostris*, Gould.**

South part of North Island, N.Z.

1. **FEMALE.**

2. **MALE.**

Presented to J. Hancock by Mr. G. H. Swan,
Napier, N.Z., May, 1884.

NOTES.

1. *Note on the Young Great Auk.*—Mr. Fox's statement (in the Synopsis of the Newcastle Museum, 1827) that the young bird from the Wycliffe-Allan Museum has "six or eight grooves at the tip of the lower mandible" would lead any one to infer that it represents a much older bird than it really is. There are really only three or four rather obscure grooves or furrows on each side of the lower mandible, and these are not near the tip, but commence near the middle with a nearly perpendicular furrow (the strongest) extending from the upper margin to the strong angular projection on the lower edge. The furrows in advance of this strongest furrow are very irregular and obscure and require to be closely looked for on both sides of the mandible. On the upper mandible or culmen there is one large sulcus or groove at the base of the bill and another a little in advance with a ridge between them, not so strongly marked as in the adult bird. The culmen is very hooked, very smooth and pointed, and very feeble compared with the massive form in the adult; and the proximal and distal parts of the lower mandible are both very smooth. The feathers of the throat and specula shew white with dark edges. Compared with the young of the Razorbill this would be a bird of the year changing from first feathers to winter plumage which is not quite perfected. Ed.

2. *Note on the additions to the Hancock Collection.*—The chief additions to the collection since Mr. Hancock's death are mostly in the group Palmipedes or Webfooted birds which group was left incomplete. The additions are indicated in the Catalogue by the donors' names being printed in *Italics*. Most or all of these additions have been stuffed by Mr. John Jackson who was assistant with Mr. Hancock for many years. Ed.



ADDRESS TO THE MEMBERS OF THE TYNESIDE
NATURALISTS' FIELD CLUB.

READ FOR THE PRESIDENT, THE REV. CANON TRISTRAM, F.R.S, D.C.L.,
ETC., AT THE FIFTIETH (JUBILEE) ANNIVERSARY, HELD IN THE
COMMITTEE ROOM OF THE NATURAL HISTORY SOCIETY, 20TH MAY,
1897.

LADIES AND GENTLEMEN,—This is an epoch of Jubilees, and at the close of its first half century of existence, the Tyneside Naturalists' Field Club may well claim to notice and record the past, and to look back on a career which, if modest and unobtrusive, has at least, as we firmly believe, fully carried out the objects which its founders had in view. On 25th April, 1846, at a meeting in Newcastle it was resolved "That a Society be formed under the name of the Tyneside Naturalists' Field Club, for the practical study of Natural History in all its branches, and that the Antiquarians of the district be invited to unite with the Club for the promotion of their pursuits through its meetings." How these objects have been pursued, let the long series of Volumes of Transactions tell. Of the band of zealous naturalists who composed its membership 50 years ago, six still survive, and one of them Mr. Richard Howse, is still an active Co-Secretary of the Club. Our treasurer for far more than a generation, R. Y. Green, we rejoice to find still among our members. Dr. Denis Embleton, our president in 1851 and again in 1874, yet remains the father of the Club. Dr. W. Greenwell, F.R.S., the illustrious Antiquary, Rev. Walter Featherstonhaugh, and Dr. James Hardy, whose name is so identified with our elder sister, the Berwickshire, are still spared in a hale and vigorous old age.

To the Berwickshire Naturalists' Club belongs the proud distinction of being the oldest of all the Field Clubs of Britain. We were among the earliest of its followers, and now there is not a county and scarcely a district in the country which does not possess such an Association. The practical study of Natural History has indeed made rapid strides in the last 50 years. In

1846 there had been no great advance since the days of Linnæus. For a century observers had been content to collect specimens, to describe specimens, and, following in the steps of the immortal White, of Selborne, to note the habits of the creatures with which they were familiar. But the philosophy of biology was untouched. The geographical distribution of families and species, the relationship of the various groups, the modification of various forms of life through isolation, through changed conditions, the development of insular faunas, the effects of the struggle for existence, all these great problems were untouched. There had been no systematic observation of the times and paths of migration—that great mystery of bird life, that still unsolved problem of ornithology. The phenomena of the fauna of New Zealand, of the Sandwich Islands, of the Galapagos, and indeed of Australia itself, were scarcely inspected. With Charles Darwin and his theory of evolution, propounded in 1859 in his “Origin of Species,” commenced the epoch of the Biology of to-day. Even the elders among us can scarcely realize the revolution that has been brought about in our studies and modes of thought by that book and all that followed it in rapid succession, from the pens of Huxley and others too numerous to name, whether their theories be accepted or not.

But one thing this revolution has brought into very clear light, the immense importance and value of *field observation*, of noting the minute variations and modifications, the habits and little circumstances of mineral and vegetable life, even in their humblest forms. Who shall say, when we read the wonderful illustrations of patient observation by the greatest mind applied to the most insignificant things, “Vegetable Mould and Earth Worms,” or again “The Movements of Plants,” that there is not still abundant scope for the eyes and mind of the Field Naturalist? Never let the “Tyneside” dwindle and shrink into a mere club for a pleasant country outing in the season! Let us emulate our predecessors, and feel it to be our duty to add something, however humble, to the store of human knowledge in our own department; so may the Club maintain its old traditions, and the future volumes of the Natural History

Transactions be a worthy continuation of the old "Tyneside Field Club Transactions."

No prominent city in the land, I suppose, could boast such a galaxy of naturalists, scientists, and geologists as were gathered in and round Newcastle when the Club was founded. Joshua Alder, T. Sopwith, Wm. Hutton, H. L. Pattinson, brothers Hancock (Albany and John), T. J. Bold, G. Wailes, and many others. It cannot be that they have left no successors.

Let me remind you of a few of the illustrious names which have graced the President's chair. Our first President and Founder was the accomplished Ralph Carr-Ellison, whom many of us remember, the friend of my boyhood, and who, being my father's nearest neighbour, gave me my earliest lessons in field natural history. Among the long list of his successors are the names of the well-remembered J. F. Bigge, The Vicar of Stamfordham, Joshua Alder, our still surviving friend Dr. Denis Embleton, T. Sopwith, G. Wailes, Sir W. C. Trevelyan, Wm. Greenwell, Dr. Charlton, Dr. Bruce, to whom the Roman Wall owes half its fame, Dr. Merle Norman, H. B. Brady, alas! prematurely removed from our midst, but whose brother G. S. Brady, thrice our President, we rejoice to see still in our midst. Dr. Philipson, E. J. J. Browell, Rev. G. R. Hall the Antiquarian of North Tyne, Rev. J. E. Leefe, a botanist unrivalled in his knowledge of the difficult family of the *Salices*, and many others make up the catalogue of the successive occupants of this chair, and give lustre to our records.

Among the papers which have enriched our Proceedings, none surpass in value the descriptive catalogues of our local Fauna and Flora. Notably the Birds, by John Hancock; the Mammalia, by Mennell and Perkins; the Fishes, by R. Howse; the Insects, by Hardy and Bold; Lepidoptera, by Wailes; the Mollusca, by Joshua Alder; Flora, by Tate and Baker; the Carboniferous Flora, and the Permian Fossils, by Richd. Howse; the Marine Algæ, by G. S. Brady; the Zoophytes, by Joshua Alder; Foraminifera, by H. B. Brady; Echinodermata, by Geo. Hodge. Of other papers I would draw attention to the invaluable contributions of Albany Hancock and Dr. Embleton, and

the philosophical essays of both G. S. Brady and H. B. Brady on departments in which they were masters, but of which few naturalists are more than learners. But it would be invidious to particularize further among our 18 volumes, when it may justly be said that all are good.

FIRST MEETING, 20th May, 1897. Whittle Dene was selected by the founder and first President of the Club, Mr. Ralph Carr (afterwards Ralph Carr Ellison, Esq.) as the most suitable place for the first Field Meeting of the Club on the 20th May, 1846. About fourteen members left Newcastle by the early train on the Carlisle line for Prudhoe Station, where they were joined by the Rev. John Bigge, the Rector of Ovingham, and his curate, the Rev. Walter Featherstonchaugh, the present Rector of Edmundbyers, one of the three survivors of the First Field Meeting.

Most of the members breakfasted together at the old Inn in the village, others, who had breakfasted before leaving Newcastle, strolled round Prudhoe Castle, and afterwards rejoined the rest, when a visit was paid to Bewick's tomb, after which a leisured walk up the Dene where all the rarer plants, some just beginning to shew themselves, were pointed out by Mr. Bigge. A nest of the Grasshopper Warbler with two eggs was found by John Hancock and several other birds were observed in the Dene. About forty species of Land Mollusca were collected, and a few of the earlier Insects captured. Thus they proceeded, collecting, observing all that presented itself to view, or entering into suitable conversation till they were driven about mid-day to take shelter from a short thunder shower, under the lofty bridge that spans the Dene about half way up, the President utilizing the time by giving a lively explanation of the names of the adjacent places. Afterwards the Spital Well and the then new Reservoir of the Whittle Dene Water Company were visited. The beautiful little *Primula farinosa* in full bloom was seen and gathered by several present for the first time. The return walk was a short cut through fields and pastures new, where the Moonwort and the Adder's Tongue and other plants of interest

were pointed out by Mr. Bigge. The Club dinner at the Old Inn was not what would be considered a frugal meal, but the cost of the old wine and the fat venison led soon after to the established rule of the Club that the frugal meal shall not cost more than half-a-crown or three shillings, and this Rule has been carefully and severely observed now for fifty years.

It was thought desirable by the Committee of the Club that the Jubilee Meeting should be held at Ovingham and Whittle Dene, thus giving the present members an opportunity of walking through the beautiful Dene trodden by their predecessors at the first Field Meeting of the Club, and this selection was approved of by all the members present at the Anniversary Meeting. Unfortunately our Reverend President was not able to be present, but a goodly company of twenty members assembled at the Prudhoe Station and crossed, not in a Ferry boat as of old, but along a substantial wooden bridge now spanning the Tyne, to Ovingham Church Yard, where the burial place of Thomas Bewick and his family (now the resting place of all of them) was visited and contemplated. The majority of the party proceeded onward through the beautiful Dene, luxuriant and shady and bedecked with abundance of the earlier spring flowers, "the rathe primrose," "the wild hyacinths," that purple all the ground with vernal flowers, the "tufted crow-toe," the modest violet, and many other harbingers of early spring. The several species of Ferns still in circinate veneration, gradually unfolding their still downy fronds to the growing warmth of the sun attracted the attention of others, and the birds occurring in the secluded parts of the Dene were not without observers, for the ornithologists present discovered the nests of the Water Crow or Dipper and the still better concealed nest of the Wood Wren. Thus the time was passed much in the same pleasant way that it was passed by the first members fifty years ago. But some portions of the route must be much changed, for in former times no fences or plantations concealed the Whittle Dene reservoir. By the time the Spital Well was reached the party became somewhat scattered, but eventually, by straighter roads and easier paths, they all retraced their steps to Prudhoe Station,

where a substantial tea, a frugal meal, awaited the now hungry party at the Old Boathouse Inn. The Sheriff of Newcastle, Mr. George Harkus, presided, and congratulated the members present on the successful celebration of the Club's Jubilee. The Members had done it well that day by following in the footsteps of their predecessors, and observing and maintaining their wise and pleasant ways.

The SECOND FIELD MEETING was held at Bamburgh, on Friday, June 12th, with the intention of visiting the Farne Islands if the weather permitted. Many of the party proceeded to Bamburgh on Thursday afternoon, and spent the evening in a pleasant ramble around this charming seaside village, admiring the extensive restorations which are being carried out by Lord Armstrong, and afterwards visiting the churchyard and memorial tomb of Grace Darling. Numerous specimens of the Cinnabar Moth were observed during the evening walk, which was intensely enjoyed by all present.

On Friday morning the party, increased by fresh arrivals, drove to Sea Houses, where they found the good coble Triumph and a sturdy crew awaiting their arrival. Bright sunshine, a smooth sea, and a favourable southerly breeze bore them pleasantly to the Megstone, where they fortunately were able to land, as this can be done only at low water. This rock is also known as the Cormorant's Island, and it was a curious and interesting sight to see more than one hundred and fifty of these long-necked, long-billed Birds sitting bolt upright on their nests, while a few were sunning their wide-stretched wings, spread-eagle fashion. As the first colony of nests were approached, their owners quickly sought refuge on the sea, but the greater number separated from the intruders by only a narrow channel, and seemingly conscious of perfect security, twisting their necks this way and that, looked down on the visitors with quiet wonder. The nests are flat structures of coarse seaweed about two feet across and eight or nine inches deep, containing from two to five eggs, or in a few instances newly-hatched young—most repulsive looking little objects, suggesting a long-necked, long-

nebbed, two-legged toad, with a leaden-blue shiny snake-like skin. From the Megstone the party sailed past The Wamses and the scene of the wreck of the 'Forfarshire' to the Longstone, the farthest island of the Outer Farnes, to see the Lighthouse where the Darlings lived, but time did not permit them to land. On their way to the Brownsman, they passed through the Midden Gut and visited the Little Harcar, which had not been at first intended. Most of the party remained on board, and the others quickly got on board again, owing to the rapidly rising tide, which was running like a mill-race. Here two of the lighthouse keepers, in their well-named boat the Rescue, paid a visit to the Triumph, and after some interchange of pleasant compliments the voyage was resumed, picking up, fortunately, on the way one or two valuable articles which had been dropped overboard. On the Brownsman the birth-place of Grace Darling was visited, and close by it an Eider-duck sitting on her nest. It was stated that she had not been seen to leave her nest, nor eat any food for four weeks, a wonderful example, if correct, of strict attention to maternal duties, at any rate she took not the slightest notice of the party who stood closely around her. Several other Eider Ducks were seen and closely approached without their being disturbed. Many nests of the Arctic and the Common Tern were noticed, almost all with one egg. On the Staples the Lesser Black-backed Gull was very numerous, much care being required in walking about to avoid treading upon their nests, which now contained generally the complement of three eggs. These birds rose from their nests on being approached, but with less clamour than might be expected, but quickly returning to their nests within a few yards of us. Many Puffins were seen flying about or sitting on the water, but none of their nests—which are underground—were searched for or seen. It is not a pleasant thing to search for their nests, as these birds have strong bills and a bad temper, and know how to use the former effectively. A beautiful nest of the Eider, built of small fine red seaweed and covered with down, was much coveted, but left untouched. Another nest, containing five eggs, which the duck had left without covering up as usual,

was also noticed. The pinnacles, close by, presented the most wonderful sight to be seen on this Island, the Staples. They are massive pillars of basaltic rock, about fifty feet high, with their flat tops covered with Guillemots standing bolt upright, and crowded as close together as they could stand. They were supposed to be sitting on their eggs, but it was impossible to see any eggs, or to imagine how any bird leaving its egg could find it again in the crowd. Among them could be seen several specimens of the Ringed Guillemot as it is called. On the little narrow ledges of the pinnacles below, were to be seen numbers of the beautiful light-coloured Kittiwake closely seated together.

The party next sailed to the Kettle and landed on the Knoxes. An Eider Duck's nest with seven eggs was observed, and again was noticed the remarkable quietude of these birds, for in only one instance did a Duck leave her nest. But on those Islets the great attraction was innumerable Terns—Arctic, Common, and Sandwich—all of which rose at once when the party landed and flew overhead, whistling and crying, twisting and turning in every direction, and enchanting all with their slender white forms and graceful swallow-like flight. Their beautiful eggs are laid on the sand, shingle, or rock, without any pretence of a nest, and so near together that the greatest care is required to avoid treading on them. Every step needs careful watching, and care has to be taken that one does not inadvertently step, as was nearly done, on an Eider Duck, whose placid, quaker-like demeanour was in amusing contrast to the anxiously crying crowd overhead. Nests of the Ring Dotterel and the Oystercatcher were also seen, but the nest of the Rock Pipits, which were numerous, was not found.

The next visit was to the Inner Farnes, where St. Cuthbert's Chapel was visited, afterwards the Castle, from the top of which a magnificent view of all the Farnes, Holy Island, and Bamburgh Castles, and a wide stretch of country inland was obtained. A shoal of Porpoises kindly entertained the party with their gambols on their return to Sea Houses. Here, after a pleasant voyage of fourteen or fifteen miles, they regretfully parted with their boat's crew, whose bright faces, intelligent information,

and anxiety to oblige in every possible way had added greatly to the enjoyment of the excursion. After a welcome meal at the Victoria Hotel, the station at Belford was soon reached on the homeward journey. Favoured by sunshine and a quiet sea, visiting so varied a collection of beautiful birds in their native breeding haunts, surrounded by every scene of Grace Darling's life, from her first home to her last, and enjoying under favourable weather the magnificent scenery of the most classical and historical part of Northumberland, this visit will long be remembered by those who had the good fortune to be there.

THE THIRD FIELD MEETING was attended by fifteen members and friends on the 17th July, at Haydon Bridge for Bardon Mill and Housesteads. Here conveyances were as far as possible obtained for the ladies and elder members, the younger members proceeded on by train to Bardon Mill, and walked up the Chineley Burn to Chesterholme, botanizing by the way and gathering several interesting plants, among other the Greater Broomrape, which, on account of the unaccountable destruction of the Common Broom, is becoming rare all over our district. It may surprise some of our members that it was gathered by our older botanists by the riverside where Elswick Works now stand. Leaving Chesterholme unvisited, the walking party proceeded by High Shields to the Basaltic Craggs above Crag Lough, gathering and observing abundance of the Rock Rose in splendid flower. Along the northern shore of the lake the Sundew, the Butterwort, and the Bog Asphodel were gathered. This party secured a light refreshment at the hospitable Hotbank, and then marched on to Housesteads. After a short inspection of this celebrated camp, as direct a route as possible was taken for Haydon Bridge. On the way they crossed the Muckle Moss with little difficulty, which, in ordinary seasons, is attended with some danger, but drainage, and the long season of drought was shewn by the prevalence of seed vessels and the fullness of the flowers growing on the Moss.

It was found impossible to obtain suitable conveyances from Haydon Bridge, and much time was lost in the endeavour to

find conveyances, and finally, several members were left behind, who solaced themselves with a walk to Langley Castle, returning home early, the others proceeded—some quickly—up-hill to Housesteads, and the rest by the more circuitous route by Bardon Mill to the Cliffs above Crag Lough; eventually all met at the Old Camp, and after refreshment at the farm house, in the shape of a welcome cup of tea, the time having been spent most enjoyably in the delicious mountain air, a move was made homeward, and Haydon Bridge was reached in time to partake of a small dinner before the departure of the last train to Newcastle. During the stay of the train at Hexham, a flock of from 20 to 30 wild geese was observed flying in angular fashion, at a great height overhead, rapidly towards the north-east, a rather unusual sight so early in the autumn.

THE FOURTH FIELD MEETING was held at Beal for Holy Island on Monday, the 31st August. The morning was anything but propitious. Amidst a steady downpour of rain, but seven members mustered to join your President at the Central Station. By the time Beal had been reached the atmosphere had cleared, and the remainder of the day was all that could be desired for an excursion. The tide was out, and the little party was left to proceed in two very primitive conveyances across the oozing sands to Holy Island. Here they found themselves absorbed and lost in the crowd of a vast party, brought by special train from all parts of the County of Durham, to visit and commemorate the home of St. Cuthbert, organized by the Church Defence Association, and led by Dr. Eastwood, of Darlington, and your late energetic and enthusiastic President, Rev. A. Watts. Lost in the crowd, the Tynesider became perhaps more archæological and historical than zoological, as, under the kindly guidance of Sir William Crossman, the generous and appreciative owner of the greater part of the Island, they examined the remains of the ancient Priory and its noble Church, and noted the reverential care with which Sir W. Chapman has cleared out the ruins and is preserving them from further decay. Mr. Watts, standing on the base of a column of the church, delivered an interesting

address on the character and history of the Priory and its founder.

After this, your members were asked to share in the liberal luncheon, which had been arranged for by the forethought of this Archæological and Ecclesiastical party in the Village School, and which was fully appreciated after our early morning start.

The inner man refreshed, the afternoon was devoted to naturalising. Mr. Watts guided the party to the front of the cliffs, and lucidly explained the Geology of the Island and the neighbouring coast. Then the botanists and zoologists scattered over the island. Mr. Watts' geological notes and botanical list are appended. Your President was pleased to ascertain, not only that the Eider Duck, so interwoven with the legendary history of St. Cuthbert and Lindisfarne, is rapidly increasing, but that the beautiful Shieldrake still is able to rear its young in some sequestered haunts. The purple Sandpiper may be occasionally seen, and two parties of the Rock Pipit, probably broods of this year, were observed. The Gulls, Terns, and Guillemots, which breed on the neighbouring Farnes, had for the most completed their domestic duties and gone out to sea.

Towards sunset, again at low water, the party drove back across the sands, just in time for the last train, without further mishap than the fall of a coachman, who had freely imbibed, from the box into a salt pool. Thoroughly had all enjoyed themselves, and they returned with feelings of compassion, such as "a superior person" might indulge in, for those members of the club who had been deterred from joining the expedition by the morning's outlook.

A DAY'S RAMBLE AMONG ROCK AND FLOWERS OF HOLY ISLAND.

Geological Notes.—Sandstone below limestone on north side of island, at base, banded red and white or yellow, one foot; carbonaceous seam $\frac{1}{4}$ down cliff-face from top *eastwards*, to $\frac{1}{4}$ *westwards*. Three caves, first much destroyed; second, with arch and window, is largest; third, deep, but narrow, with invasion of pebbles. Eastwards rises on sea-floor a dark shale

with "Cuthbert's beads." Fine ripple-marks in variegated sandstone on the *under* side of sea-undermined portions.

Further west, past sand stretch, domes of thin limestone running out in line of reefs, affording pretty pools in the angles of the truncated layers of the domes. A raised beach at this point on the shore.

Beyond, to Salmon-stakes, limestone pavement and sand-hills right down to beach. Raised beaches all over the Snook among the dunes: half-way down one dune 12 or 15 feet above general level, all quite recent apparently. Sandstone and limestone run north and south right across the island, in roughly, but well-marked, parallel ridges, giving miniature hill ranges. Found in shales opposite St. Cuthbert's islet, several good *Bellerophon*, *Prodnetus longispinus*, *Monticulipora*, *Trigonocarpon*? and many *Encrinurites* and *Orthoceras*.

Botanical Notes.—Gathered in flower or fruit, the following:

- | | |
|------------------------|--|
| 1. Sea Plantain. | 23. Mouse-ear. |
| 2. „ Grass. | 24. Corn Nettle. |
| 3. Small Red Valerian. | 25. Red „ |
| 4. Large „ | 26. White „ |
| 5. Corn Daisy. | 27. Campion, white. |
| 6. Chamomile. | 28. „ marine. |
| 7. Mallow. | 29. Dandelion. |
| 8. Hard-head. | 30. Herb Robert. |
| 9. Purple Thistle. | 31. Bugloss. |
| 10. Silver Weed. | 32. Dock. |
| 11. Buttercups. | 33. Willow-herb. |
| 12. Clover (white). | 34. Sow Thistle. |
| 13. „ (yellow). | 35. Wild Parsnip. |
| 14. Pig-nut. | 36. Coltsfoot. |
| 15. Wild Parsley. | 37. ——— |
| 16. Hemlock. | 38. Groundsel. |
| 17. Charlock. | 39. Poppy. |
| 18. Yarrow (white). | 40. Pansy (small yellow). |
| 19. „ (pink). | 41. Pansy. |
| 20. Ragwort. | 42. Teasel. |
| 21. Starwort. | 43. Shepherd's Purse. |
| 22. Crosswort. | 44. Thread Weed (<i>white</i> , 5 petals) |

- | | |
|------------------------------|----------------------|
| 45. Chickweed. | 51. Pinpernel (red). |
| 46. Centaury (in pure sand). | 52. Spinach. |
| 47. Dyer's Rocket. | 53. „ marine. |
| 48. Thrift. | 54. Stonecrop. |
| 49. Yellow Thistle. | 55. Lady's Mantle. |
| 50. Rest-harrow. | 56. Knotted Spurrey. |

Besides Centaury, (lovely dwarf plants growing in pure sand) and the variety of the little Knotted Spurrey (which I had not found before), there were several curious sand-plants new to me. Also one in a damp place in the old north quarry, with yellow leaves and small five-petalled white flowers. In the sand plants, one bore pale yellow clover-like heads of flower, but all very dwarf.

ARTHUR WATTS.

Mr. Meek has kindly furnished a few notes of the Dredging excursion, which the members were kindly invited to again this year by Mr. John Dent, of Blyth. Several members left Newcastle by the 7.45 a.m. train to Blyth, on Wednesday, the 2nd September, and were joined by others from Whitley. The weather unfortunately was threatening rain, and the sea presented a heavy swell, causing some anxiety and several of the party to remain on shore. Those who ventured amused themselves, and postponed threatened sea-sickness, by employing the time the trawl was down with a little line fishing, capturing a number of the Grey Gurnard, from which several parasites (fish lice) were collected. Trawling was very difficult on account of the heavy ground swell, and the fish captured consisted chiefly of immature specimens, which were quickly returned to their native element. These were mostly flat fish, Dabs and Plaice, which the series of excursions made last year shewed plainly are on the increase on the Northumberland Coast. Numbers of small Gurnards were caught in the trawl, and the number of small Spiny Dog-fish was very remarkable. Among the products of the trawl were a number of fine *Cyprina islandica*, and a host of the "Livid Swimming Crab," *Portunus holosatus*, which is exceedingly common in all the sandy bays. Several specimens of *Lutraria elliptica*, and the fry or spat of *Mytilus edulis*, were

brought up from the inshore trawling. There were also numerous examples of the edible Crab, *Cancer pagurus*, and the common Dog-crab, *Carcinus menas*, with a fine specimen of *Alcyonium digitatum*, or, as it is sometimes called, dead men's fingers.

In the surface net were captured a rich supply of *Medusæ* (Sea Blubbers) and *Pleurobrachia*, of which the Isopod Crustaceans, *Eurydice achata*, and *Idotea tricuspidata*, soon made short work.

In the afternoon, the steamer returned to Blyth, and landed those of the party who had not fully enjoyed the swell and roughness of the sea; but those who remained on board went to the Haddock grounds, a few miles further out, where the fishing lines were effectively used. One of the surface nets in use here captured a goodly number of *Sagitta* and *Pleurobrachia*, as also a remarkable marine Planarian.

The number of birds observed was not remarkable, but, during the time the steamer was at the Haddock grounds, it became very suddenly surrounded in a mist, when a number of Sparrows, and a Wheatear also, I think, came to the boat and rested on different parts of the rigging, our return home enabling many of them to regain the land.

The majority of the party enjoyed this short sea excursion, and expressed their thanks to Mr. Dent, who had given them an opportunity for another excursion, and for the liberal hospitality shewn them on board his steam yacht.

On Thursday, 24th September, several members of the Club left Newcastle for the Lake district. The cold and unfavourable weather, which prevailed for several days previously, had the effect of deterring many from joining this excursion. Nevertheless, seven or eight members left the Central Station, among whom were the Sheriff of Newcastle, Mr. George Harkus, Mr. Coroner Graham and Mrs. Graham, Mr. and Mrs. Mark Pybus, one of the Secretaries, and others. Penrith was reached at one o'clock, the journey was resumed up the Ulleswater and over the Kirkstone Pass to Ambleside. The places visited by the

party included Lake Side, Stock Gill Force, Elter Water, the valley of the Langdales, Dungeon Ghyl, Grassmere, Keswick, Lodore, Buttermere Valley, and Scale Force. The weather, and the lateness of the season, did not allow of much botanizing or other Natural History pursuits, but as the party were amply provided with garments waterproof, their personal enjoyment of the Lake district traversed was not otherwise seriously impaired, indeed, the long continued previous rains, caused some of the special natural features of the district to be seen at the greatest advantage.

Most of the Ferns of Lakeland, and a number of the Club-Mosses, were seen in their natural habitats—many of the *Laburnums* were seen to be in second bloom—only a few birds were observed, as several Carrion Crows near Elter Water, a Buzzard soaring far overhead, but of most interest perhaps, was an immense flock of Housemartins, congregating at Bowness, preparatory to their autumnal migration. Notwithstanding the weather those present expressed themselves to have enjoyed this late and distant excursion to their heart's content, returning safely from Keswick on the Monday evening.

The LAST MEETING of the year was held at Roker for a walk to Whitburn and Marsden. Four or five members were present, and they report that they had very fine weather and an enjoyable walk along the picturesque coast that extends from the Wear to the Tyne. The first object of attraction was the almost unique natural section of the botryoidal and cannon-ball limestone exposed in the cliff a little towards the north of Roker. This spot is classical, as it was visited and described by Prof. Sedgwick in the early part of the century, and has been visited and puzzled many observers, scientific and otherwise, by the striking and peculiar structure exhibited by this limestone. Though the present shape is a conglomeration of small balls attached to each other in a greater or less degree in one of the beds, and an accumulation of large rounded or spherical masses resembling large-sized cannon-balls, it cannot be supposed that these shapes were the original form of the deposit. These balls

seem to have been formed in a bed of soft marl by the infiltration from above of drops of water strongly charged with carbonate of lime which assumed a spherical form and gradually displaced the marl of the original deposit. In some instances shells have been found in the centres of larger spheres, but such organisms have not been found in the smaller balls of the botryoidal bed, for these balls are generally solid or rarely with an irregular hollow centre as if some mineral had formed the nucleus which has since been filtered out. It would require the space of a monograph to detail the unique and unusual appearances that can be observed in the coast sections of this remarkable piece of rock scenery extending with varied appearances all along the coast from Roker and Whitburn to the Trow rocks near the Tyne. After examining the Roker cliffs the party walked to Whitburn, where refreshments were obtained, and thence on to Marsden, alas! not the Marsden in days of yore when Peter and Mrs. Allan annually entertained a large party of the Club to their usual tea of ham and eggs, and girdle cakes. Few botanical observations could be made at so late a season of the year, and on arriving at Marsden, which has now been converted into a pit-village, and where much of the beauty and loveliness of the coast has been destroyed, the members left by the first train on the way to their respective homes.

The following gentlemen were elected members of the Club during the year 1896-97:—

RICHARD ADAMSON..... Winlaton.
 THOMAS BELT Bigg Market, Newcastle.
 ERNEST BLAIR..... Thorney Terrace, South Shields.
 GEORGE SLATER Haltwhistle, Carlisle.
 D. WOOLACOTT 156, Roker Avenue, Sunderland.

The following places were fixed for Field Meetings for 1897:

JUNE 15TH Prestwick Carr and Neighbourhood.
 JULY 7TH... Scots Gap and Rothley Lakes.
 JULY 24TH-27TH ... Dumfries and the Solway Fisheries.
 AUGUST 20TH Haltwhistle and Roman Station *Æsica*.
 SEPTEMBER 15TH..... Warkworth and Amble.

The following gentlemen were elected as Officers of the Club
for 1897-98 :—

PRESIDENT.

E. J. J. Browell, Esq.

VICE-PRESIDENTS.

R. Y. Green.

| Rev. W. Johnson.

D. Embleton, M.D.

HON. TREASURER.

W. E. Branford.

HON. SECRETARIES.

Richard Howse

| Thomas Thompson.

Richard Adamson.

COMMITTEE.

T. W. Backhouse.

Thomas Belt.

Rev. W. McLean Brown.

Joseph Cobb.

Isaac Clarke.

George Harkus.

Rev. J. M. Hick.

G. H. Philipson, M.D.

John Philipson.

W. M. Pybus.

J. F. Spence.

R. M. Tate.

AUDITORS.

J. S. Forster.

| Arthur Tranah.

XVI.—On *Ilyopsyllus coriaceus* and other Crustacea taken at Alnmouth, Northumberland, in 1899. By GEORGE STEWARDSON BRADY, M.D., LL.D., D.Sc., F.R.S., C.M.Z.S. (Plates XI.—XIII.).

THE remarkable little Crustacean which forms the principal subject of this paper was first described from specimens taken by the late Dr. David Robertson and myself in 1872. These specimens were found in black peaty mud about the roots of fuci near the head of Roundstone Bay, Ireland, and not far from high water mark. The mud was collected for the sake of any shells of Foraminifera and Ostracoda which it might contain, and was simply bagged and dried for examination at home. Copepoda of ordinary constitution would have been so shrivelled by this treatment as to be practically useless and indeed almost unrecognisable, but this species possesses an integument so dense as to undergo comparatively little change in drying, while its usually vivid red colour, which seems to withstand not only desiccation but most chemical reagents, renders it easy of detection amongst its native mud. Nevertheless I was unable from the dried material to make out satisfactorily the more minute details of its structure, and from that time up to the autumn of the present year (1899) no further material has been available. About ten years ago I found a single specimen amongst a gathering of mud-loving brackish water species from Lymington, Hants; and I have had sent to me—I think by Dr. Chevreux, though I have no written memoranda—two or three specimens found in oyster-ooze from Arcachon, France. And only this morning Dr. Norman writes to me as follows:—"I have lately found *Ilyopsyllus* in a gathering made in 1874 in Birtirbuy Bay; and after all these years in spirits the brilliant red colour remains." I am not aware that the species has been seen by any other observer, except Mr. T. Scott, who has taken a single specimen at the mouth of the River Alness on the Cromarty Firth.

During a recent visit to Alnmouth, however, I was fortunate enough to meet with *Ilyopsyllus* in the mud of the salt-marshes near the mouth of the Aln. It is not confined to one bit of the river but may be found I think almost anywhere on the surface of the tidal mud, though probably restricted pretty much to the belt just below high water mark. Most of my specimens were obtained in the extensive backwater on the south side of the river, in a patch of reeds growing at the extreme edge. The little creature is by no means abundant and one has to collect a good deal to secure a very few examples. In the very first gathering which I made there I noticed, on examining my captures with a powerful hand-lens, a minute moving speck of a brilliant red colour, so brilliant that one must resort to the terms of the jeweller adequately to describe it; ruby is indeed pale by comparison. I at once recognized that I had chanced, for the third time upon *Ilyopsyllus*, and a few more visits to the place enabled me to secure specimens, few indeed, but sufficient for further investigation of its structure. The creature is very small and its extremely tough exo-skeleton makes its dissection a matter of difficulty: moreover it is extremely opaque, and I found it impossible to get rid of the colour. I tried steeping specimens in solution of Potash and in Sulphurous Acid, but without effect. Perhaps a more prolonged immersion in some such medium might give better results. Still, I have succeeded, I think, in making out most if not all of the structural details, which are in many respects of great interest. It may be noted that Mr. T. Scott has described in a paper on the Entomostraca of the Gulf of Guinea,* a very closely allied (perhaps really the same) species—*Ilyopsyllus affinis*—which was taken amongst Confervæ in a lagoon at São Thomé Island. The very minute mouth organs of this species are illustrated in detail, but do not seem altogether to agree with those which I have been able to observe in *I. coriaceus*. Unfortunately no further specimens of *I. affinis* are available for comparison and the original dis-

* Report on Entomostraca from the Gulf of Guinea by Thomas Scott, F.L.S., Naturalist to the Fishery Board for Scotland (Trans. Linn. Soc., Lond., 2nd series, Zoology, Vol. vi., Part 1, 1894).

sections (in the British Museum) have now, as I am informed by Professor T. Jeffrey Bell, deteriorated so as to be useless. For a revision, therefore, of my original description I have had to depend entirely on the new material obtained at Alnmouth. My chief difficulty has been with the mouth-organs, in the examination of which I have sacrificed all my specimens. The result, though not entirely satisfactory, is such as to render a new description of the animal desirable. This will be found on a succeeding page.

The following list comprises all the Crustacea noticed by me during my visit to Alnmouth—29th August to 12th September. My collecting was confined to the littoral zone: I did neither dredging nor tow-netting. The greater part were obtained in weedy pools among the rocks near low-water mark, others on the muddy river bank or in brackish pools subject to tidal overflow: the estuarine forms are marked in the list with an asterisk. Some of the species are new to our district; a few are apparently new to science: of these I give here brief descriptions. For the determination of the Amphipoda and Isopoda I am indebted to the Rev. Canon Norman who kindly examined my specimens. Amongst this group Dr. Norman considers the following as additions to our local fauna; *Paratylus uncinatus* (G. O. Sars), *Apherusa borealis* (G. O. Sars). Amongst the Schizopoda, *Siriella norvegica* and *S. armata* are hitherto unrecorded. The more interesting species of Entomostraca are considered in detail further on.

Schizopoda. *Macromysis flexuosus*. (Müller). (Very abundant in the river and in tide-pools).

Siriella armata, G. O. Sars.

„ *norvegica*, G. O. Sars.

Amphipoda. *Apherusa bispinosa*, Sp. Bate.

„ *jurinei*, M. Edwards.

„ *borealis*. G. O. Sars.

Calliopius Rathkei, Zaddach.

Paratylus uncinatus, G. O. Sars.

Gammarus locusta, Linn.

Amphithoe rubricata, Mont.

- Isopoda.* *Idotea granulata*, Rathke.
 Jœra marina, Linn.
- Copepoda.* **Eurytemora clausii* (Hoek).
 **Acartia clausii*, Giesbrecht.
 Parapontella brevicornis (Lubbock).
 Cyclops salinus, sp. n.
 Cyclopina littoralis, G. S. Brady.
 Ectinosoma melaniceps, Boeck.
 **Delavalia palustris*, G. S. Brady.
 **Platychelipus littoralis*, G. S. Brady.
 Stenhelia limicola, sp. n.
 Dactylopus longirostris? Claus.
 Thalestris mysis, Claus.
 ,, *peltata* (Boeck).
 Idya furcata (Baird).
 Harpacticus chelifer (Müller).
 Zaus spinosus, Goodsir.
 Laophonte similis (Claus).
 **Ilyopsyllus coriaceus*, B. & R.
 Echinocheres violaceus, Claus.
 Cyclopicera berniciensis, sp. n.
 Artotrogus boeckii, G. S. Brady.

COPEPODA.

Series 1. GNATHOSTOMATA.

Cyclops salinus. sp. n. (Plate XII., figs. 11—15).

Anterior antennæ ten-jointed (fig. 11), the first three joints very imperfectly separated; lengths of the joints as in the following formula—

1	2	3	4	5	6	7	8	9	10
3	3	3	2	2	10	4	2½	2½	3

bearing a few short hairs towards the apex; posterior antennæ simple, three-jointed, without any lateral branch (fig. 12). Swimming feet very short and stout, all the branches three-jointed (figs. 13, 14), the terminal joints much dilated, not much longer than broad. Abdomen (fig. 15) slender, elongated,

joints of the furca quite four times as long as broad, distinctly constricted in front of the middle, each bearing two terminal setæ.

Hab.—Among Fuci in pools near low-water mark. Only one example of this *Cyclops* was seen, and it was not in quite perfect condition, but the genus is so little known as inhabiting salt water that it seems desirable to make a record of this species which is undoubtedly distinct from those hitherto described. The marine species already recorded are *Cyclops magn-octavus*, Cragin, found by Mr. I. C. Thompson in "low-water marine pools at Lytham," but which is also a fresh-water species; *C. marinus*, Thompson, dredged in 20 fathoms in the Irish Sea, and *C. Ewarti*, G. S. Brady, which was first found in the Firth of Forth, but has since been noticed by I. C. Thompson in a 20 fathom dredging from the Isle of Man, and by myself in tow-net gatherings from New Zealand. There have also been described two Scandinavian species, *C. magniceps*, Lilljeborg, and *C. christianensis*, Boeck.

Ectinosoma melaniceps, Boeck.

This pretty little species,—easily recognized by the dark grey patch upon its head—is generally distributed round the British shores, though nowhere very common. Several specimens occurred in gatherings from among Algæ in tide pools. This is the first record of its appearance in our district, but I have lately found it abundantly in a gathering from Cullercoats.

Platychelipus littoralis, G. S. Brady.

This interesting species is tolerably abundant in the mud of the River Aln and in the tidal pools of the adjacent marshes. *Delavalia palustris* occurs as usual in company with it, and with these species one almost always finds associated *Cythere castanea* and *Loxoconcha viridis*.

Stenhelia limicola, sp. n. (Plate XII., figs. 1-7.)

In general appearance like *Canthocamptus*, slender, and with very short antennæ and limbs (fig. 1). Anterior antennæ extremely short, scarcely longer than the rostrum (fig. 2) eight-jointed, the peduncle much stouter than the distal portion.

Mandible stout and well-developed (fig. 3), with a large 3 (or 4) lobed palp: swimming feet having both branches three-jointed (figs. 4, 5), laminæ of the fifth pair of feet small, nearly equal in length (fig. 6) and not nearly covering the much elongated ovisac, which, when fully formed, extends almost to the extremity of the abdomen but contains only a small number of very large ova; caudal segments very short, about half as long as broad (fig. 7), the outermost of the terminal setæ very short and bulbously dilated at the base. Length .66 mm.

Two or three specimens were taken near the old oyster-hatchery at the side of the Aln. I have also specimens of this species which were taken about three years ago on the muddy shores of the River Glen, at Carrick, Co. Donegal.

Dactylopus longirostris? Claus. (Plate XIII., figs. 9-12).

? *Dactylopus longirostris*. Claus. Die frei lebenden Copepoden, p. 127, Plate xvii., figs. 4-6.

One imperfect specimen which probably belongs to this species occurred in a gathering from pools near low-water mark. The female only is described by Dr. Claus: my specimen was a male, but the general characters so nearly approach those of the type that I do not much doubt the propriety of the reference. The antenna and some of the limbs are shown in Plate XIII.

Thalestris mysis, Claus.

Thalestris peltata, (Boeck).

Taken in tide-pools among Algæ. Neither species has before been noticed in our district.

Series 3. LEPTOSTOMATA,* Series nov.

* λεπτός, slender, στόμα a mouth.

Genus *Ilyopsyllus*, B. & R., 1874 (= *Abacola*, Edwards*).

Ilyopsyllus coriaceus, Brady and Robertson. (Plate XI., Plate XII., fig. 8).

1873. *Ilyopsyllus coriaceus*, B. & R., Ann. & Mag. Nat. Hist., Ser. 4, vol. XII., page 132. Pl. IX., figs. 1-5.

„ „ Brady, Monog., Brit. Copep., vol. II., p. 143, pl. LXXXII. figs. 1-10.

* Edwards, C. L. Beschreibung einiger neuen Copepoden, etc., Berlin, 1891.

Outline as seen from above somewhat lozenge-shaped, greatest width behind the middle and equal to about half the length: seen from the side the ventral margin is almost straight, the dorsal forming a very bold and almost semicircular arch (fig. 1) colour deep red, the edges of the abdominal segments uncoloured: rostrum (fig. 3) short, broad and blunt, slightly emarginate at each side where there is attached a short hair; abdominal segments slightly spinous at the lateral angles, caudal segments short and stout, about as broad as long, principal tail setæ as long as the body of the animal, lateral setæ only about one-sixth as long; those of the male are of the usual width (fig. 1), those of the female (plate XII., fig. 8) dilated and spatulate proximally. Anterior antennæ of the *female* (figs. 3, 4) five-jointed, the first joint very large and stout and produced into a hood-like process which overhangs the second joint, second joint much smaller than the first, but stouter than the remaining three; in the *male* the antennæ are swollen and geniculated, with a clawed apex (fig. 5). Posterior antennæ scarcely shorter than the anterior and quite as stout, destitute of any secondary branch but bearing at the apex four stout claw-like setæ, the penultimate joint also bearing similar setæ. Mandible (fig. 8) extremely small, almost obsolete, and provided with a small bisetose, two-jointed palp: the remaining mouth-organs consist of a series of minute filamentous appendages (fig. 7) arranged on each side of what appears to be a suctorial, protrusile mouth. Outer branch of the first pair of feet three-jointed, each joint bearing a stout, curved marginal spine, the apical joint having in addition three long terminal setæ (figs. 9, 10); outer branch two-jointed, bearing two apical setæ, which in the *female* are simply curved, but in the *male* are shorter and stouter, divergent and bulbously dilated at the bases: the second, third, and fourth pairs of feet have both branches three-jointed (figs. 11, 12) and bear very long and delicately plumose setæ, fifth pair (Plate XII., fig. 16) very minute, each foot consisting of a subquadrate lamina tapered and furcate at the distal end. The feathering of the setæ as represented in fig. 11. is much too coarse and is in fact scarcely perceptible except with higher

microscopic powers. Between the bases of the fourth pair of feet in the *male* is a complex lobose organ very similar in general aspect to the copulating apparatus of some Ostracoda (figs. 12, 13). The spermatophores (fig. 14) are very large in proportion to the size of the animal extending when *in situ* over nearly one-third of the length of the body. Length .55 mm.

Hab.—On the surface of mud near high-water mark on the margin of the River Aln.

The structure figured and described in the Monograph of British Copepoda, as a fifth pair of feet seems to be only a part of the peculiar organ found at the basis of the fourth pair in the male but non-existent in the female. The situation of the organ would rather lead to the supposition that it may be in some way connected with the reproductive function, but of this I can say nothing certainly.

The movements of the animal in a living condition are very interesting. I was unable with the imperfect appliances available at Alnmouth, to isolate a specimen under the microscope, but with a hand-lens its habits could be fairly well watched, the brilliant colour of the animal making it conspicuous. So far as I have seen it never attempts to swim, but glides very actively and with a sort of serpentine or eel-like motion among the particles of mud or debris. How the motion is produced I could not ascertain, but my impression is that it is by the action of the tail rather than the feet,—a motion rather of the “pulsellum” than the “tractellum” kind. The flexible abdomen and long tail, with the massive, immobile character of the anterior part of the body seem to support this view.

The genus *Abacola* proposed by C. L. Edwards (*loc. cit.*) is undoubtedly identical with *Ilyopsyllus*, the latter name having the claim of priority. *Abacola holothuriæ*, however, appears to be parasitic either in or on a sea-cucumber, and is probably distinct from the British species.

The mouth organs are totally different from those of any other Copepoda known to me. The almost obsolete mandibles, and the reduction of all the other mouth apparatus—maxillæ and maxillipeds—to a few very minute filaments or setæ, preclude its

coming into line with any one of the three divisions established by Thorell. I therefore propose for the reception of *Ilyopsyllus* a new section under the name Leptostomata. The divisions of Copepoda based upon the structure of the mouth organs would then stand as follows.

Series 1. GNATHOSTOMATA

Os mandibulis duabus libens tribusque paribus maxillarum instructum, siphone nullo.

Series 2. PÆCILOSTOMATA

Os mandibulis et siphone carens, maxillarum paribus 3—1 (—0) instructum.

Series 3. LEPTOSTOMATA

Os mandibulis duabus perparvis et maxillarum paribus (?3) tenuissimis instructum, siphone nullo.

Series 4. SIPHONOSTOMATA

Os in siphonem, mandibulis 2 plerumque includentem productum et maxillarum paribus 3—0 instructum.

According to the view taken in this arrangement, the differences which separate Series 1 from 2, 3, and 4 are analogous to those which divide mandibulate from haustellate insects, the chief distinction between Siphonostomata and the two intermediate groups, Pæcilostomata and Leptostomata, being the presence of a siphon or suctorial tube in which certain of the mouth-organs are enclosed. There may, of course, be transitional forms difficult of reference to any group, but this is a disadvantage common to all systems of classification.

Series 4. SIPHONOSTOMATA.

ECHINOCHERES VIOLACEUS, Claus. (Plate XII., figs. 9, 10).

1889. *Echinocheres violaceus*, Claus, Über neue oder wenig bekannte halbparasitische Copepoden, p. 30, Plate VI., figs. 1—10.

A single specimen which agrees closely with Dr. Claus' figures and description was found in a gathering taken among Algæ in tide-pools. I give a drawing of the entire animal and an enlarged figure of the anterior antenna. My specimen, however, was a little defective as to setæ, which had doubtless been

broken and injured accidentally. Dr. Claus says respecting it "this pretty violet, black-pigmented Ascomyzontid" was first found amongst Algæ along with other Copepoda, but that later he had discovered it to be parasitic upon *Strongylocentrotus lividus* "with the colouring of which it remarkably harmonizes," and he adds that Dr. Græffe had found specimens of that sea-urchin infested with hundreds of *Echinocheres* both male and female.

CYCLOPICERA BERNICIENSIS, sp. n. Plate XIII., figs. 1—8.

Male. Anterior antennæ seventeen-jointed, with a small inner branch (fig. 2): swimming feet with both branches three-jointed (fig. 5) but the outer branch of the fourth pair is short, the last two joints being rudimentary and without spines, the terminal joint spine-like and subulate. In other respects *C. berniciensis* presents the usual characters of the genus. Of this species only one example was found: it occurred in the same gathering as the *Echinocheres* and, like it, was a good deal damaged.

ARTOTROGUS BOECKII, G. S. Brady.

This species I have not previously seen except from the West coast of Ireland. A single specimen was found at Alnmouth among Algæ near low-water mark.

Among other interesting specimens taken at Alnmouth were the following:—In brackish water by the side of the river were found several specimens of *Acartia clausii*, all of which were infested with what is probably an immature Trematode parasite. This in its most advanced condition forms a large club-shaped projection on the dorsal surface of the cephalothorax. I secured only about half-a-dozen specimens of the *Acartia*, and from these have not been able to trace completely the development of the parasite, and a later visit to the locality in the hope of obtaining more material was unsuccessful. In Plate XIII. will be found drawings of some of its stages. The ova of the fluke are probably swallowed by the *Acartia* and begin their development in its alimentary canal, eating or boring their way through the tissues until they appear externally. The earliest stage which I have seen is shown in fig. 14,—a rounded, finely cre-

nated prominence of the cephalothoracic integument; further developments are seen in figs. 13 and 14, and in fig. 16 is shown what is probably the final stage of the intermediate life history. At the distal extremity in figs. 13 and 16 may be noticed small sucking discs (?), and in fig. 16 a structure, which Prof. G. O. Sars has called in a similar organism, the byssus thread*. The probability seems to be that the parasite represents the larval stage of a fluke of which the *Acartia* is the intermediate host. Where the final steps of the fluke may be attained it is impossible at present to say; probably, I think, in the intestine or on the outer surface of some fish. The dab, being very abundant in the river Aln, may perhaps be the final host, but I cannot hear of any fluke having as yet been found in or on it.

ALCYONIDIUM HIRSUM. This beautiful Polyzoon seems to grow abundantly on the reef of rocks immediately to the north of Alnmouth. I could always find it among the heaps of washed-up seaweed there, but, excepting a few very small young specimens I did not succeed in finding it growing. Probably it lives chiefly a little beyond low-water line. I mention it here on account of the minute Algæ which live on and in it in great abundance,—so abundantly indeed that the creature itself is often quite masked by its deep red investment. This at first deceived me into the belief that I had got an actual red Alga. I am indebted to E. A. Batters, Esq., for examining and naming these parasites, and for kindly allowing me to print the following list of them.

Endozoic species.

Chantransia endozoica, Darbshire.

Epicladia flustræ, Rke.

var. *Phillipstii*, Batt.

* The description here referred to will be found in Prof. G. O. Sars' report on the Schizopoda of the "Challenger" expedition, p. 221, plate 38. Respecting the byssus Sars says "the most peculiar feature is the mode in which the parasite is affixed within the body cavity of the Schizopod. For this is not effected by any of the sucking discs, but with the aid of a kind of byssus excreted from the posterior end of the animal and dispersed within a peculiar sac-like body lying transversely within the posterior part of the body cavity of the Schizopod and at least with one of its extremities firmly connected with the outer skin." A structure very similar to this is seen at fig. 19, Plate XIII.: the byssus thread is marked *b*.

Epixoic species.

Chantransia Daviesü, Thur.

Erythrotrichia carnea, J. Ag.

Ceramium rubrum, Ag.

Polysiphonia urceolata, Grev.

Rhodochorton membranaceum, Mag.

Spermothamnion Turneri, Aresch.

var. repens. Le Jol.

Pylaiella littoralis, Kjellm.

? Rhodymenia palmata, Grev.

Hardly more than .5 mm. high.

EXPLANATION OF PLATES.

PLATE XI.

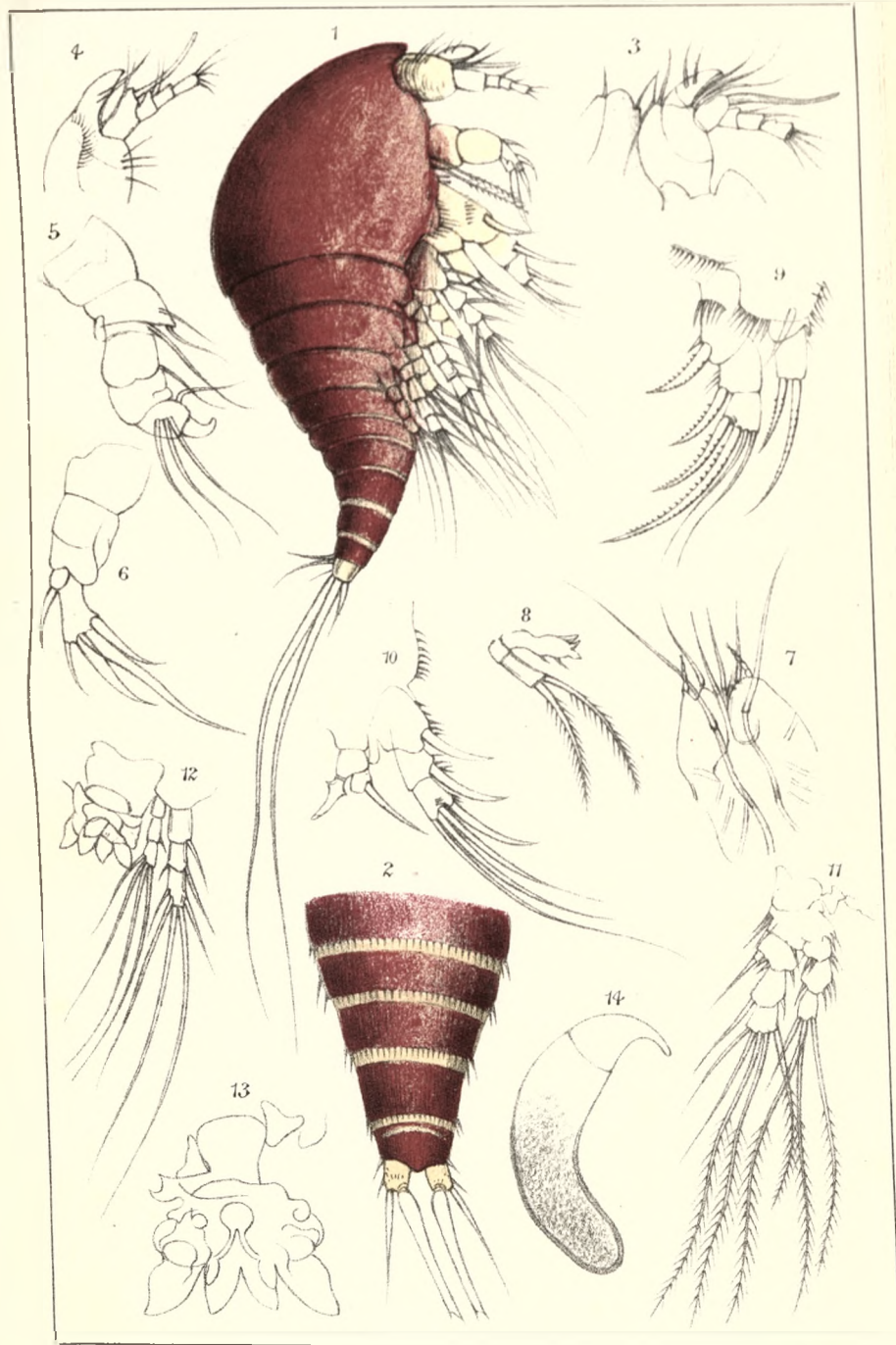
ILYOPSYLLUS CORIACEUS.

- Fig. 1. Female seen from right side $\times 140$.
 2. Abdomen of male seen from above $\times 240$.
 3. Anterior antenna of female, with rostrum $\times 240$.
 4. The same seen obliquely $\times 240$.
 5. Anterior antenna of male $\times 280$.
 6. Posterior antenna $\times 280$.
 7. Mouth and mouth-organs $\times 550$.
 8. Mandible and palp $\times 280$.
 9. Foot of first pair, female $\times 240$.
 10. " " male $\times 240$.
 11. Foot of second pair, male $\times 240$.
 12. " fourth " " $\times 240$.
 13. Appendages of fourth pair of male $\times 240$.
 14. A spermatophore $\times 240$.

PLATE XII.

STENHELIA LIMICOLA ♀

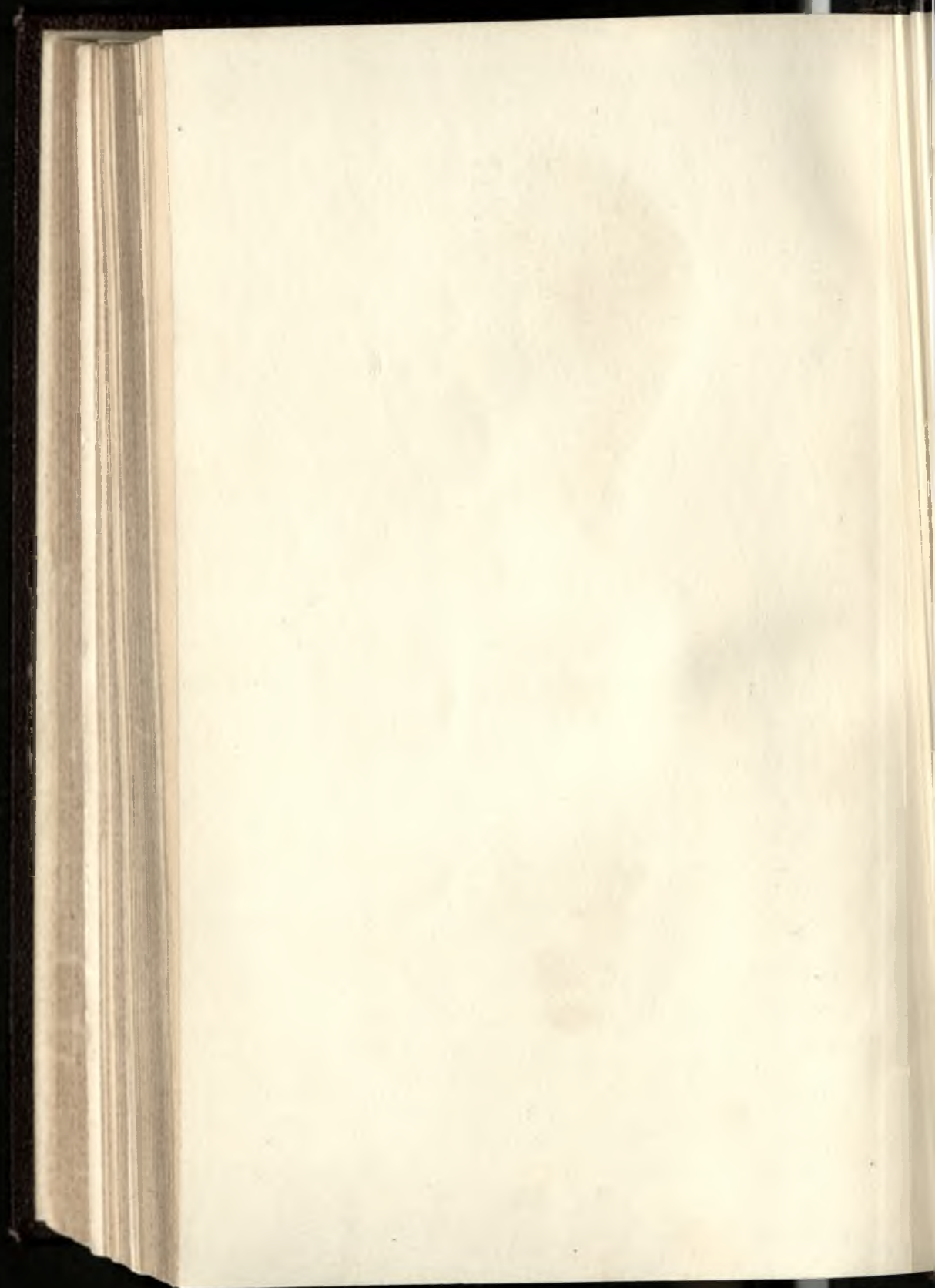
- Fig 1. Female seen from left side $\times 100$.
 2. Anterior antenna $\times 440$.
 3. Mandible and palp $\times 440$.
 4. Foot of first pair $\times 240$.
 5. " third pair $\times 240$.
 6. " fifth pair $\times 240$.
 7. Furca $\times 240$.

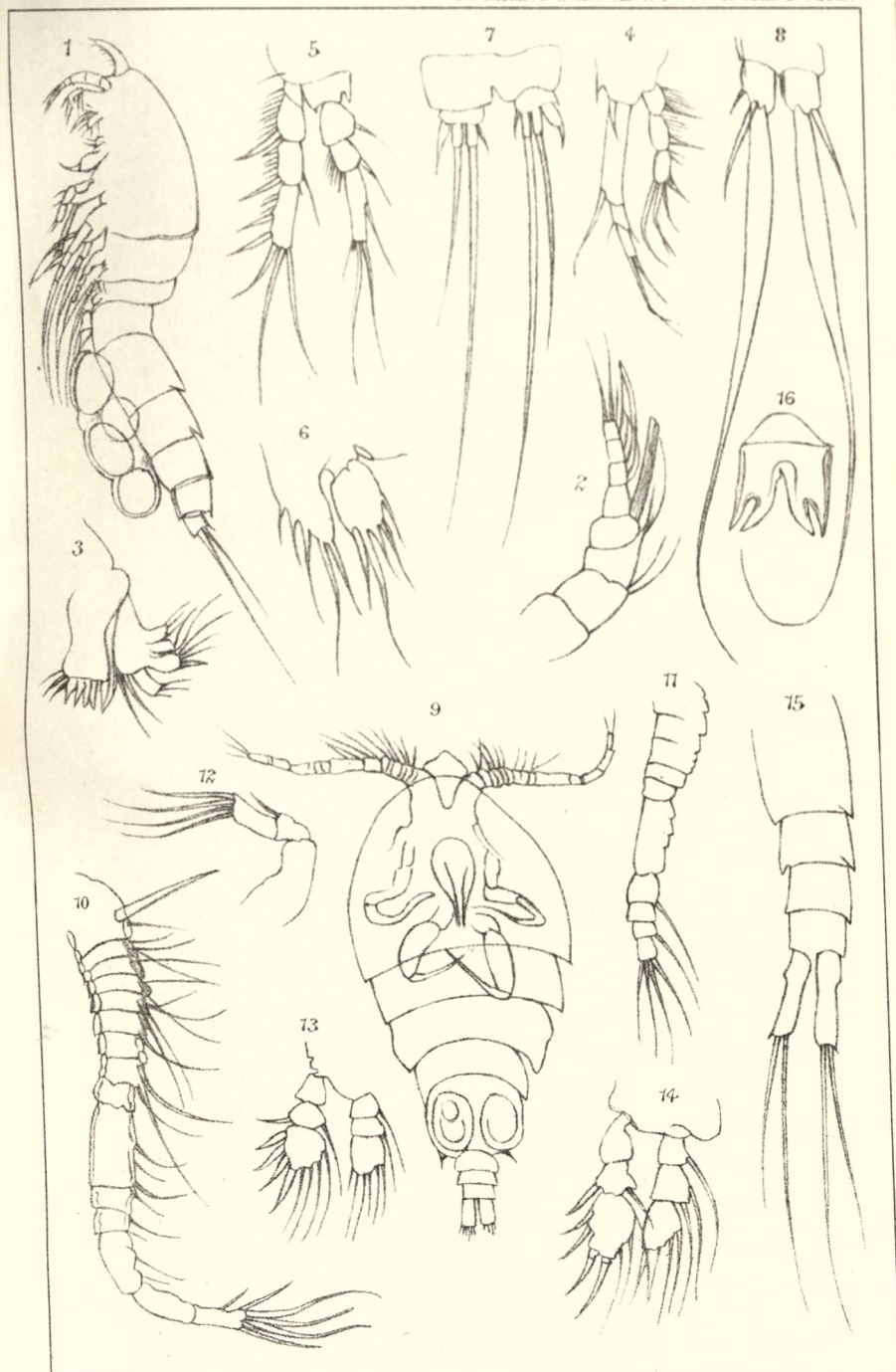


G.S. Brady del

Geo. West & Sons Heli

ILYOPSYLLUS CORIACEUS.

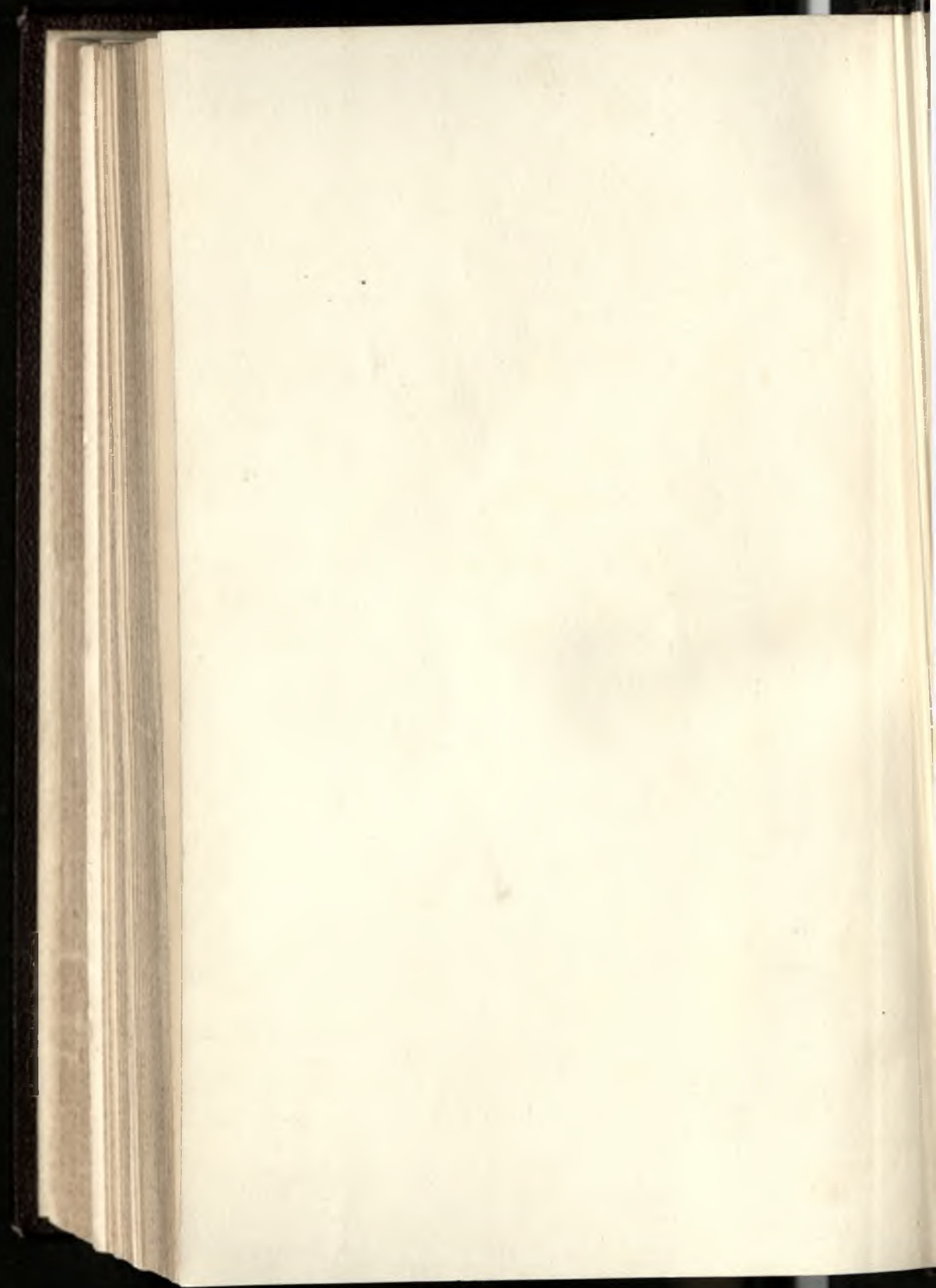


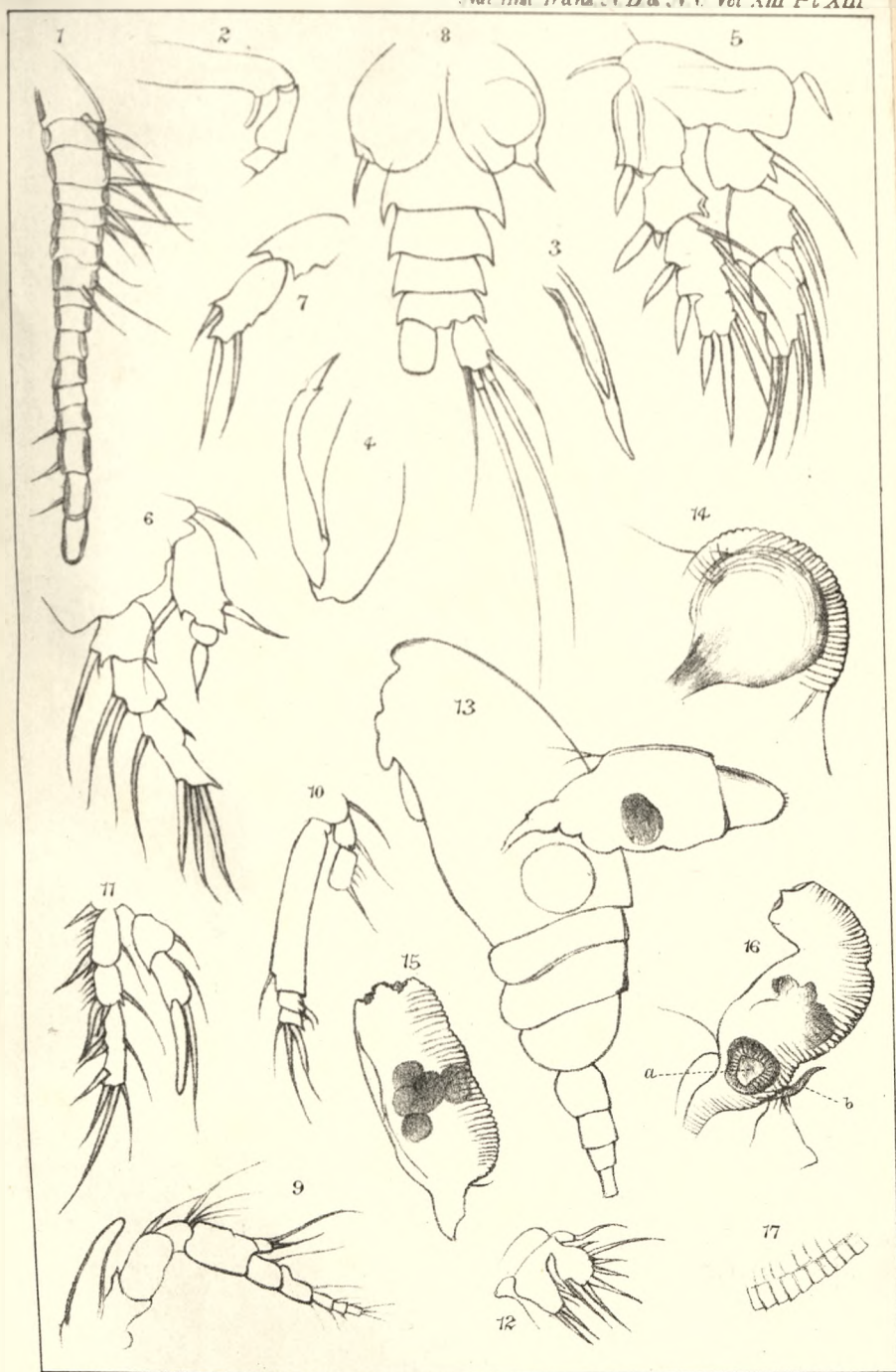


G.S.Bracy del.

Geo. West & Sons lith.

- 1 - 7 STENHELIA LIMICOLA
 8, 16 ILYOPSYLLUS CORIACEUS
 9, 10 ECHINOCHERES VIOLACEUS
 11 - 15 CYCLOPS SALINUS.

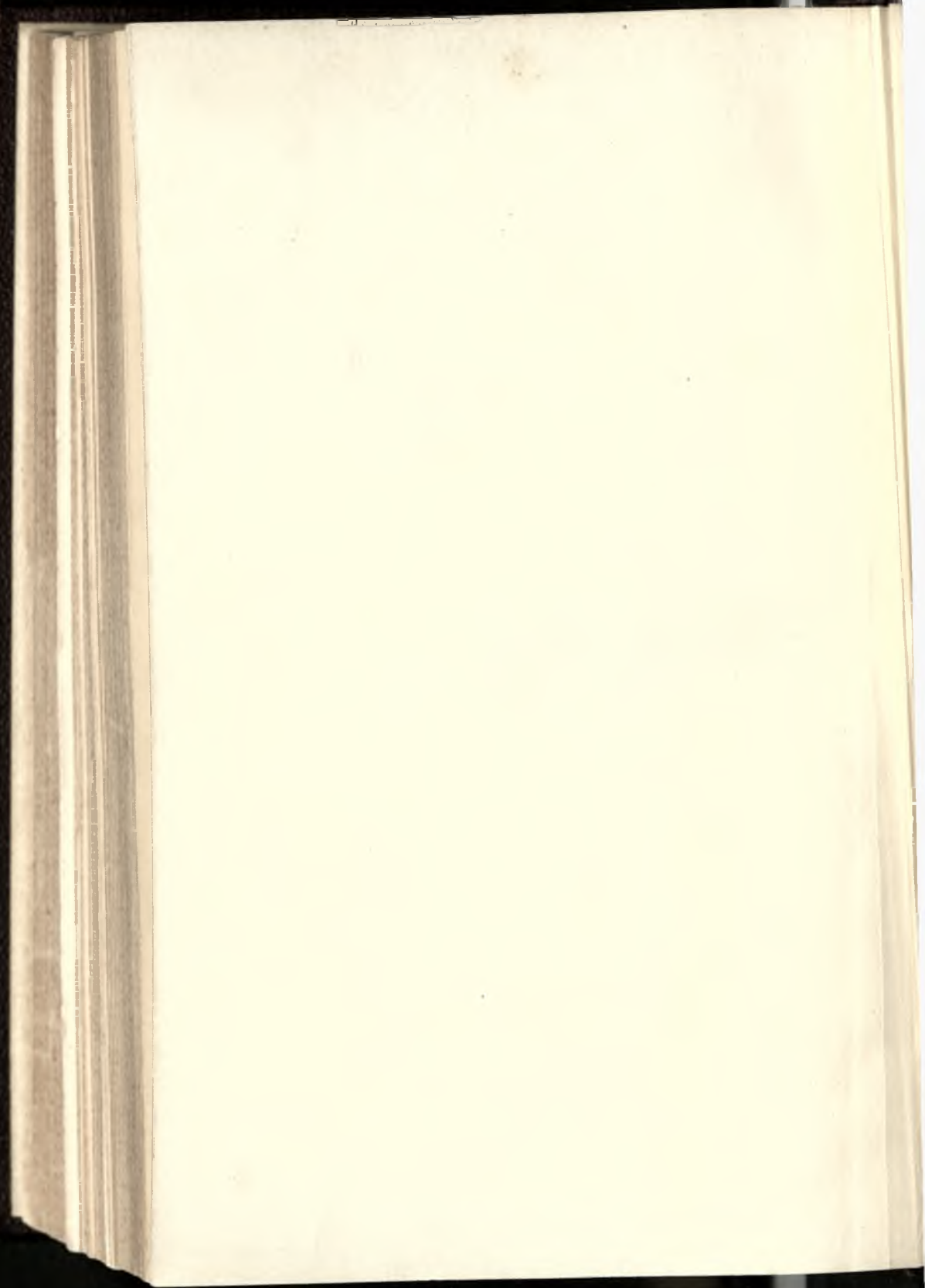




G.S.Brady del.

Geo. West & Sons lith.

1 - 8 CYCLOPICERA BERNICIENSIS
 9 - 12 DACTYLOPUS LONGIROSTRIS
 13 - 17 PARASITE OF ACARTIA.



ILYOPHYLLUS CORIACEUS.

8. Tail of female $\times 240$.
 16. Fifth pair of feet of male $\times 440$. (*Figure left out*).

ECHINOCHRES VIOLACEUS ♂

9. Male seen from below $\times 100$.
 10. Anterior antenna $\times 250$.

CYCLOPS SALINUS ♀

11. Anterior antenna $\times 300$.
 12. Posterior antenna $\times 300$.
 13. Foot of first pair $\times 300$.
 14. „ third pair $\times 300$.
 15. Tail $\times 250$.

PLATE XIII.

CYCLOPICERA BERNICIENSIS ♂

- Fig. 1. Anterior antenna $\times 240$.
 2. Posterior antenna (imperfect) $\times 240$.
 3. Mandible $\times 240$.
 4. Foot iv $\times 240$.
 5. Foot of third pair $\times 240$.
 6. „ fourth pair $\times 240$.
 7. „ fifth pair $\times 240$.
 8. Abdomen and tail $\times 150$.

DACTYLOPUS LONGIROSTRIS ♂

9. Anterior antenna $\times 250$.
 10. Foot of first pair (imperfect) $\times 250$.
 11. „ second pair $\times 250$.
 12. „ fifth pair $\times 250$.

TREMATODE PARASITE OF ACARTIA CLA SII.

13. Acartia, with parasite *in situ* $\times 66$.
 14. Early external stage of parasite $\times 66$.
 15. Later stage of parasite $\times 66$.
 16. Final „ „ $\times 66$.
 17. Portion of cuticle of the same $\times 240$.

XVII.—*An Afternoon's Dredging off Cullercoats.* BY PROFESSOR
G. S. BRADY, M.D., F.R.S., &c.

THE President of the Northumberland Coast Club (Alderman Dent) having kindly lent his steamer "Livingstone" for the purpose, a party of some thirty or forty members of the Club set out for a short dredging excursion from Cullercoats on the afternoon of the 24th of July last. The weather was delightfully fine and the sea smooth, and the results of the afternoon's work were, if not very wonderful, at any rate interesting enough to deserve record. The ground dredged over was not of the best or most productive character, the most conspicuous contents of the net being generally a few of the commoner Echinoderms with masses of Dead Man's Finger (*Alcyonium digitatum*). But in the washings from the débris were afterwards found a considerable number of interesting Crustacea, lists of which are here given. I have to thank our old friend the Rev. Canon Norman for having kindly examined and named the Cumacea, and the Rev. T. R. R. Stebbing for a similar service as regards the Amphipoda. All the specimens were taken in a depth of about twenty fathoms.

The tow-net captures were also of great interest. Those which call for special notice here were *Actinotrocha*, and the small flagellate Infusorian, *Ceratium tripos*, which was extremely abundant,—also a few specimens of *Cyphonautes*, — the free-swimming larva of a Polyzoon, *Membranipora pilosa*. *Actinotrocha*, the larval form of *Phoronis*, a beautiful tubicolous "worm" of uncertain affinity has not been previously noticed in our district: it has indeed been recorded from only a very small number of localities on the British coasts. It may be interesting to note that whereas both Mr. Meek and myself had tow-nets overboard, Mr. Meek captured only one *Actinotrocha*, whilst I had a very large number, the reason, probably, being that my net was sunk to the depth of a few fathoms, whereas Mr. Meek's was worked close to the surface.

CRUSTACEA.

Amphipoda. Melphidipella macra, Norman.
Ericthonius abditus, Templ.

Paratyphlus vedlomensis, Sp. Bate.

Cressa dubia, Sp. Bate.

Gitanopsis inermis, (i. O. Sars.

Ampelisca brevicornis, Costa = *A. laevigata*, Lillj.

Ampelisca spinipes, Boeck.

Haploopsis tubicola, Lillj.

Guernia coalita, Norman.

Protella phasma, Montagu.

Cumacea.

Diastylis rugosa, Sars.

Diastylis levis, Norman.

Cuma scorpioides, Mont.

Pseudocuma cercaria, Van Beneden.

Cladocera.

Evadne nordmanni, Lovén.

Podon polyphemoides, Leuckart.

Copepoda.

Calanus finmarchicus, Gunner.

Pseudocalanus elongatus, Boeck.

Acartia longiremis (Lillj).

Oithona spinifrons, Boeck.

Anomalocera patersonii, Templ.

Temora longicornis, Müller.

Longipedia coronata, Claus.

Ectinosoma sarsi, Beek = *E. spinipes*, Brady,

Monog. Brit. Copepoda.

Stenhelia ima, Brady.

Thalestris northumbrica, Brady, M.S.

Diosaccus tenuicornis (Claus)

(on *Laminaria* near low-water mark).

Peltidium interruptum (Goodsir).

Zaus goodsiri, G. S. Brady.

Lichomolgus fucicolus, G. S. Brady.

Dermatomyzon nigripes (B. & R.)

Cyclopicera, sp.

In the wash of the dredge there were found also a few specimens of an *Echinorhynchus*—unknown except as internal parasites of fishes, etc. The free condition we must assume to be accidental.

Note on Munida Bamffius (Pennant).—An interesting specimen of this long-armed Crab was presented to the Museum on April 5th, 1899. It had been captured in a Lobster-pot in 18 fathoms water off Newbiggin-by-the-Sea, and presented to the Society by J. I. Maling, Esq. So far as I can ascertain it has not been recorded for the East coast of England before, but as the specimen figured by Pennant was obtained on the East coast of Scotland it was very likely to occur on our Northern coasts. It has been recorded as found on the South coast of England, in Shetland and in Ireland, and as having been dredged alive off the Mull of Galloway in 140 fathoms water. Mr. Maling has in former years presented also some fine specimens of *Galathea strigosa* (L.) caught by the fishermen in the Lobster-pots at Newbiggin.—*Richard Howse. Jan., 1900.*

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